United States
Environmental Protection
Agency

Office of
Noise Abatement Control
Washington DC 20460

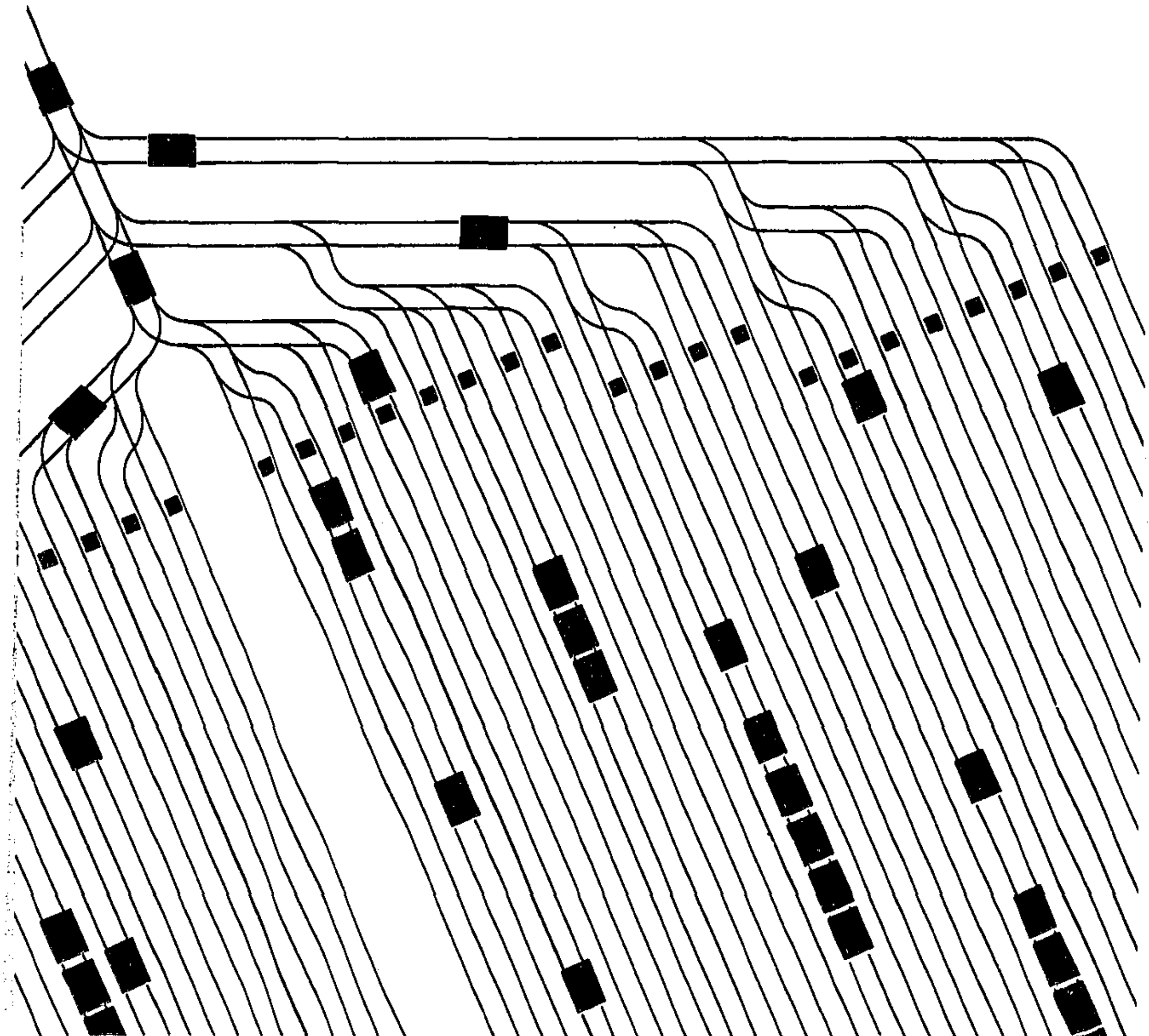
EPA 550/9-79-208
July 1979

N-96-01
II-A-90
Pt. 2

EPA

Official Docket for Proposed Revision to Rail Carrier Noise Emission Regulation

Part II



William H. [illegible] (AFR)
[illegible] Ave.
Bellingham, Washington
[illegible]

Noise Control Docket No. ONAC 79-01
Office of Noise Abatement and Control (ANR 490)
U.S. Environmental Protection Agency
Washington D.C. 20460

Dear Sir,

Environmental Protection requires that pollution of every kind [illegible] be controlled, suppressed or best of all eliminated. Noise pollution like carbon monoxide is odorless and tasteless and is also weightless and [illegible] to reconcile between mechanical standards and human limitations.

Eldridge Avenue [illegible] property line with the Burlington Northern Railroad's [illegible] of the switchyard. The [illegible] tracks along parallel this property line within fifty feet (continued).

The proposed noise (and environmental [illegible]) abatement are entirely meaningless for a variety of reasons of which I will describe a few.

1. The proposed rules are organized around arbitrary statistical standards rather than realistic human requirements.

2. The averaging method of noise pollution measurement would allow the explosion of a carload of dynamite to be perfectly legal provided enough units of low background noise were included in the calculation. This loophole makes the entire effort an exercise in futility.

3. Noise pollution abatement is scarcely mentioned. Other challenging pollution problems have been brought under control. Almost the

only thing these proposals does is to bring the victims of railroads environmental pollution under control.

The resemblance of Eldredge's homes to no-man's land is indeed real. The violent collisions of high speed coupling closely resemble the impact of exploding shells. Noisy locomotives interfere with sleep, ordinary conversation and use of the radio, TV and telephone. Car impingement running all night definitely degrade the health and welfare of those who depend on the refreshment of sound sleep during normal hours.

In addition to noise pollution there are steady degradation of property values as the jostling of high impact switching triggers slides, cracks foundations and driveways, ground water various other leakages and initiates earth movements which have been seriously detrimental to many property owners. My own garage foundation is totally ruined — the broken concrete must be removed and replaced. The foundation of the house is cracked and no longer watertight. The lack of attention to degradation is one of the deepest shortcomings of the proposals.

I could write pages of details but this should be enough to let you know that we, your fellow citizens are hurting.

Sincerely Yours
William H. Barnes

175 Crescent Drive
Dover, Delaware 19901

May 28, 1979

79-01-039

Rail Carrier Docket ONAC 79-01
Office of Noise Abatement and Control (ANR-490)
U. S. Environmental Protection Agency
Washington, D. C. 20460

Re: Proposed EPA Noise Regulations

Gentlemen:

I would like to offer the enclosed exhibits from newspaper articles with appropriate explanations which clearly indicate why millions of U. S. citizens need far more protection from railroad companies such as Conrail than is presently being proposed and much sooner than contemplated presently. The exhibits prove that Conrail officials have a total disregard for Delaware's U. S. Congressional delegation, the Governor and General Assembly, and Dover's City Council; a great disdain for the general public and a deliberate avoidance of living up to its public commitments. This comes from a company (Conrail) whose sole existance depends upon receiving huge Federal subsidies from taxpayers hard earned money and then repays us by harassing us.

1. Exhibit 1 - 5/1/79 Morning News Article

   a. Conrail announced April 1978 that it would do three things-

      (1) Move its principal switching operation to Harrington which it did.
      (2) Not store hazardous materials adjacent to the Dover residential community which it has "reportedly" not fully honored.
      (3) Not do any switching between 11:00 p.m. and 7:00 a.m. which it has totally ignored during many periods and which promise its assistant vice president for government affairs (Mr. Alvin J. Arnett) keeps avoiding in his press statements.

2. Exhibit 2 - 5/2/79 Morning News Article

   a. This indicates the nighttime switching was intentional in total disregard of 1a(3) above.

3. Exhibit 3 - 5/79 State News Article

   a. Conrail spokesman Gary Fulton stated temporary nighttime switching would be stopped by May 5. This was totally ignored by Conrail operations personnel.

RECD ANR-490
799
31 MAY 79 11:55

4. Exhibit 4 - Morning News

   a. Mr. Arnett only addressed the 1 of 3 Conrail promises which they kept and ignored the other two.

5. Exhibit 5 - 5/18/79 State News Article

   a. Mr. Arnett states that EPA gave Conrail a clean bill of health in November 1977. If that is the case then that statement is all the documentation required to prove tougher railroad night-time switching noise standards are needed immediately.

   b. Mr. Arnett said more than four million Americans are affected by railroad noise. This proves that a great number of U. S. citizens adversely affected by railroad companies need federal, state and local noise protection immediately.

6. Exhibit 6 - 5/17/79 State News Article

   a. Mr. Arnett calls Dover residents "crackpots" because we object to intolerable and unnecessary railroad switching noises during sleeping hours. No agency or government in Delaware has objected to switching operations except during sleeping hours.

   b. Mr. Arnett claims Conrail had stopped switching operations at night which is not factual. He is also stating that State law aimed at protecting citizens to be unconstitutional. That proves we need additional authority delegated to state and local governments by your proposed regulations in addition to more stringent federal control of railroad noise.

In conclusion, not only the 25,000 citizens of Dover but four million Americans are adversely affected by Conrail and other railroads. We need "proper" regulations immediately which will stop these public be-damned Conrail officials. The noise regulations are extremely important and your present proposal is totally inadequate. Please help us and many others throughout the U.S. who are in the same intolerable situation.

Sincerely,

Robert D Bewick

Robert D. Bewick, Jr.
Councilman 1st District Dover
Chairman, Utilities Committee

d
cc: Honorable William V. Roth, Jr.
Honorable Joseph R. Biden, Jr.
Honorable Thomas B. Evans
Honorable Pierre S. du Pont
Honorable Charles Legates
Honorable Edward Bennett
Mr. John P. Mogan
Mr. Eugene Ruane

Morning News 5/1/79

Bumps in the night rile New Burton Road

By JANE BROOKS
Dover Bureau

DOVER — It has been a year since Conrail announced it was moving its switching operations to Harrington - promising Dover citizens relief from nocturnal noises of bumping and grinding rail cars.

But according to a group of New Burton Road area residents, the railroad is celebrating the first anniversary of the promise by "shaking us out of our beds again."

"It's business as usual" with railroad cars being shunted and trains being "made up" between 11 p.m. and 2 a.m. along the tracks across the road from the Mayfair, Crossgates, Wedgewood and Sherwood subdivisons, Eugene B. Ruane, spokesman for a group of residents and a long-time Conrail foe, told a meeting of the city of Dover utility committee last night.

10 * Conrail announced last April that it was bowing to public pressure and moving its main switching yards from Dover to Harrington. The railroad promised that only cars "destined for General Foods, Scott Paper and other Dover customers" would be switched along New Burton Road, no hazardous material would be stored opposite the residential area and no switching operations would be suspended between 11 p.m. and 7 a.m. *

The railroad has broken its promise on all three counts, claimed the residents, who said the night-time noise increased from bad to worse during April.

The utility committee was sympathetic to the residents' woes and will take their case back to city council and the Delaware Congressional delegation.

The committee had its first look at Environmental Protection Agency rules governing noise, which according to Ruane "appear to have been written by the railroad" and give the city "no relief at all" from the noise nuisance.

Exhibit 1

MORNING NEWS 5/2/79

Conrail drops trick to put group to bed

By JANE BROOKS
Dover Bureau

DOVER - Business is booming in Dover — and that is why boxcars have been going bump in the night again along New Burton Road, a Conrail spokesman said yesterday.

But, the "New Burton Road Sleepless Nights Society should get some relief after Friday," said Alvin J. Arnett, vice president in charge of government affairs for the railroad.

29 * That is when Conrail will conclude a three-month "experiment" of operating three "tricks" a day to meet Dover area business demands and revert to two shifts, according to Arnett.

This should eliminate major switching operations between the hours of 8 p.m. and 8 a.m., he said.

It is just one year since the railroad announced that it was bowing to public pressure and moving its switching operations south to Harrington, promising Dover residents relief from nocturnal banging and clanging.

But, a group of New Burton Road residents told the city council utility committee Monday night, the railroad is "celebrating the anniversary" of that promise by "shaking us out of our beds again."

"We try never to forget an anniversary," responded Arnett yesterday.

The railroad has been working around the clock in the last three months, he said, to meet the increased demands of Dover customers — including General Foods, Scott Paper, Reichhold Chemicals and others.

Arnett said Conrail officials had been interviewing "all our customers" in the Dover area "to see if we can get by with two tricks a day." He said the railroad was as anxious as residents to eliminate the night shift in the interests of economy.

If the railroad could find a way to bypass Dover completely, it would move all its switching operations to Harrington where it has been "welcomed with open arms," Arnett said.

The utility committee agreed to pass on residents' complaints to city council and the Delaware Congressional delegation.

Exhibit Z

STATE NEWS 5/[illegible]/79

Residents say Conrail is still noisy

By FRAN MULSHNOCK
Staff Writer

3a *

DOVER—Conrail is still doing a "booming" business on its tracks along New Burton Road, residents say.

City council agreed Monday night to ask the railroad company to honor its original promise of June, 1978, that switching activities be moved from Dover.

The city also will seek federal money under the Quiet Cities Act to fund noise measuring equipment the city can use to surface the city's noise control ordina-

[illegible] y has Conrail not kept its promi[illegible] [illegible]nove switching operations to Harrington, the company also has broken its promise to stop what a spokesman said were "temporary" switching operations in early May, residents said.

Spokesman Gary Fulton told the *State News* in early May that some temporary switching the company was doing because of an increase in local business would be stopped by May 5.

Fulton could not be reached for comment this morning.

"They kept their promise for about three or four days," Elaine Siegel of Crossgates, said.

Siegel said she was awakened twice last week once at 1:25 a.m. and the other time at 3:20 a.m.

"Saturday morning at 3:14 they said goodbye to us with seven sharp blows of the whistle, just for the hell of it, to let us know they were there," Crossgates resident Eugene B. Ruano said.

"They surely were not trying to let cars or other trains know they were coming at that time of the morning," he said.

Councilman Robert D. "Dick" Bewick said he was awakened by the train whistles early one recent morning as well.

"And I live in Woodbrook, more than a half mile away," he said.

"Now if it woke me up, I can imagine what it did to the residents out there," he said.

Exhibit 3

Noise problem won't be silenced

By JANE BROOKS
Dover Bureau

DOVER - "The 'Dover noise problem' has a great likeness to a tar baby. We just can't seem to 'be shed' of it," a Conrail vice president said here yesterday.

Commenting on three anti-noise bills and a house resolution to end the "nocturnal bumping and grinding of railroad cars," Alvin J. Arnett took exception to accusations that Conrail had not kept its "promise" to move switching operations from Dover to Harrington a year ago.

The railroad did move to Harrington because it was "the logical hub" for Delmarva operations, Arnett said. "The relief to the residential community along New Burton Road was a salutary by product," he said during hearings conducted by the House Environmental Committee.

Residents claimed recently that Conrail had resumed night switching in the Dover area, prompting Dover City Council to send a resolution to state and federal delegations and setting off another round of Conrail criticism.

Arnett reminded the panel hearing that the controversy already hadbeen settled once in U.S. District Court, when the railroad was found to be well within federal Environmental Protection Agency noise standards and the City of Dover was told "to seek its relief in the federal rulemaking process."

The railroad is mainly concerned with federally proposed rules because noise abatement, like water pollution control, is inherently a federal problem, said Arnett.

Referring to proposed EPA standards, Arnett suggested that the city of Dover and the state take advantage of the opportunity to comment on the rules in the making by the June 1 deadline.

*a

News Journal 5-17-79

Exhibit 4

STATE NEWS 5-18-79

Conrail veep will avoid Dover noise

By FRAN MULSHNOCK
Staff Writer

ROCKVILLE, Md.—Alvin J. Arnett says he has no intention of spending the night in Eugene B. Ruane's house.

Ruane said Arnett, a Conrail assistant vice-president, has had a "standing invitation" to spend the night in Dover and hear for himself the railroad' noise residents along New Burton Road have been griping about for two years.

Ruane has been an unofficial leader of those complaining residents.

"I feel like we're being nibbled to death by ducks. I don't think they will be satisfied until we start using rubber tires and marshmallow couplers," Arnett said.

9 * "I don't have to spend the night in Dover, the EPA already gave us a clean bill of health in November, 1977," Arnett said by phone from his Rockville, Md. office.

Arnett was referring to a study of noise levels done by a Cambridge, Mass., firm under contract to the U.S. Environmental Protection Agency in 1977 which he said concluded Conrail's noise was well within federal standards.

Ruane said those federal standards, even the new, stricter ones which will go into effect in 1982, allow noise levels that are still, "not tolerable."

"The rail companies wrote those regulations," Ruane contended.

"That's not true. We're going to be battling those regulations ourselves because we'll be losing some 300 jobs, as a result of them," Arnett countered.

Arnett said revenue loss from more stringent noise standards would force layoffs.

"Actually Dover residents should be proud, they have had more to do with writing those new standards than any other city in the country," Arnett said.

Arnett said activity at Dover has been reduced, "about 65 or 75 percent," since the company moved its switching yard from Dover to Harrington last year.

Arnett said more than four million Americans are affected by railroad noise so Dover residents should not feel singled-out. * 6

"We do not beard these people intentionally," he said.

"The way they talk you might think we re designing tortures for them."

Exhibit 5

Exhibit 6

Conrail switching complainants likened to crackpots

By FRAN MULSHINOCK
and J. L. MILLER
Staff Writers

a

DOVER—Dover residents who complain of nighttime railroad noise are "crackpots," a Conrail official said Thursday.

And that sparked an angry retort from one resident.

"If I am a crackpot, then it's Conrail that's cracking my pot," said Eugene B. Ruane, unofficial spokesman for the complaining residents along New Burton Road.

Alvin J. Arnett, Conrail assistant vice president for government affairs, criticized the residents at an impromptu press conference he called in Legislative Hall Wednesday to rail against a bill before the Delaware House of Representatives.

"I wish I had known he was in town," Ruane said.

Going further, Ruane even invited Arnett back to Delaware's capital if he does not believe there is disturbing noise at night.

"He's welcome to spend the night in one of our houses if he wants," Ruane offered.

The bill that brought Arnett to Delaware was sponsored by Rep. Edward J. Bennett, D-Dover, and it angered Conrail because it would restrict noise the company's trains could make at night.

The rail company promised to move its switching yard from Dover to Harrington last year under pressure from residents and local, state, and federal government officials.

Since then, residents have continued to gripe about being awakened in the middle of the night, even though company officials claim the switching operation has been moved.

Arnett said the tracks are quieter than proposed federal Environmental Protection Agency regulations for 1982 would require.

But Bennett, who angered Conrail by introducing bills to restrict the noise, replied that if that is the case, he will press for stricter state noise standards.

Arnett said in a letter to Bennett that the noise problem "has a great likeness to a tar baby."

"We just can't seem to 'be shed' of it," Arnett wrote.

b

Such a law would be an unconstitutional interference with the federal government's exclusive right to regulate interstate commerce, Arnett wrote.

The bills also could force Amtrak to curtail its passenger trains that pass through Newark and Wilmington in the heavily traveled northeast corridor, he warned.

"We moved our peninsular switching (to Harrington) on June 16, 1978, exactly as announced. To imply otherwise is to torture reality," Arnett wrote.

He called residents of the Dover developments fronting on the Conrail tracks "crackpots," and said the "nocturnal bumping and grinding" referred to in a resolution introduced by Bennett no longer exists.

Bennett was not impressed.

"These guys are something else," the Dover Democrat said.

He vowed to seek stricter standards so the noise at night is ended once and for all.

Ruane said EPA's 1982 noise standards would allow levels of noise that were "not tolerable."

"Those regulations were written by the rail companies," Ruane charged.

"Certainly I resent being called a crackpot, but I don't want to get into a shouting match with him," Ruane said of Arnett.

"But if he thinks there's no noise problem here he's misinformed, maybe his people in the yard down here are not telling him the truth," he said.

Wilderness Walks

2301 W. Raye Street • Seattle, Washington 98199
(206) 282-2301

June 13, 1979

Rail Carrier Docket
No. CNAC 70-01
Office of Noise Abatement
and Control (ANR-409)
Environmental Protection Agency
Washington, D.C. 20460

79-01-106

Gentlemen:

I am very much opposed to your proposed new regulations for noise from railroad yards. I live in the Magnolia District of Seattle, Washington, adjacent to the BN Tracks, and it is my understanding the maximum permissable noise levels established in the new regulation will allow more noise from railroad yards then has ever exsisted before in the Seattle area. Moreover, the expense of enforcing these new regulations will be higher than is now the case.

It seems ironic to me that the EPA in its mandate to improve the environment of our Nation, will be spending more money, and actually increasing the ambient noise levels.

I would appreciate a reply to this letter.

Sincerely

David Birkner

David Birkner

CC: Senator Henry Jackson
DB: jm

ANR-490
23 JUN 79 10:24

807

BOLD ANR-490

29 MAY 79 11:00

2534 Eldridge Ave.
Bellingham, Wa 98225
May 26, 1979

Office of Noise Abatement and Control
U.S. Environmental Protection Agency
Washington, D.C. 20460

Gentlemen:

We are distressed by reports that the Office of Noise Abatement and Control is considering relaxing the current regulations regarding levels of decibels permitted for railroad operations, especially at night.

Our home is situated on Bellingham's oldest and one of its best maintained residential avenues. Several of the homes in this designated Historic Area were built before the Burlington Northern railroad line was constructed, below the bank at the rear of our property. As a result of railroad operations, we are subjected to an incessant bombardment of noise from switching which goes on day and night. This noise disrupts sleep. It is particularly hard on my wife, who has been totally disabled for four years by chronic myocarditis. At times the jar of switching operations is so violent as to cause the leaves of our house plants to tremble.

We urge that there be no raising of the current E.P.A regulations. We would like to see them tightened, at least to include a non degradation clause. Local officials, some of whom share our plight, should have the option of placing a curfew on mill-ing operations during at least six hours each night.

Thank you for your consideration

Sincerely,
Eldon A Bond PhD
Professor Emeritus
Western Washington
University

231

3033 13th Avenue West
Seattle, WA 98119

June 14, 1979

Rail Carrier Docket No. CNAC 79-01
Office of Noise Abatement and Control
U. S. Environmental Protection Agency
Washington, D. C. 20460

Gentlemen:

I've just read and reread the news release regarding <u>increasing</u> the noise standards from railroad yards. I had to read it more than once because I just could not believe I was reading it right.

We live in a lovely home in a lovely section of Queen Anne Hill, just four miles from downtown Seattle. Unfortunately, the Burlington Northern railroad yards live 1/2 mile from our home, between the residential areas of Queen Anne and Magnolia hills.

I have lived for the day when our government would install regulations to <u>decrease</u> the present noise level of the railroad cars in that yard. Under no stretch of the imagination could I have conceived that just the opposite would <u>ever</u> be proposed. How prepostrous!

Thank goodness the Seattle-King County Health Department was concerned enough to alert the neighborhoods about this situation.

Present urban living has become one big headache thanks to lack of consideration for the average citizen.

Sincerely,

79-01-104

[illegible] Case 7981
[illegible] Clearance and Grading
[illegible]

Elver Bruns
2605 [illegible] Ave.
Bellingham, [illegible]
May 21-1993

In regards to Railroad Yards
Noise and pollution.
Our property joins Burlington Northern
RR main line and switching yard [illegible]
At times switching goes on at all hours of day
and night.
Some of the tank cars are marked dangerous
Explosive.
In switching some times they will hit them real
hard and hit another car hard enough to rattle 93-01-035
our windows. I am afraid that some day
there will be an explosion and then
I may not be around any more.
The noise of switching or engines using their
brakes wakes us up at night. The buildings tremble
as there [illegible] and [illegible]
The action is strong enough to start [illegible]
flowers quivering, or ripples on a pan of water.
I have known them to leave their diesel engines
on their Locomotive running over the weekend.
I thought we were supposed to save energy and
stop pollution. The Burlington Northern [illegible]
in noise, stink and pollution right near us.
I don't like it. Elver Bruns
I agree with above statement (Mrs. Alberta Bruns)

SEA
TAC BROKERS

(206) 242-8850

15001 8th. Ave., S. W., Seattle, WA., 98166

June 11, 1979

Rail Carrier Docket No. CNAC 79-01,
Office of Noise Abatement and Control (ANR-490),
U. S. Environmental Protection Agency,
Washington, D. C. 20460

Gentlemen:

The purpose of this letter is to oppose proposed legislation which establishes greater noise levels for Railroad Yards.

I reside in an Apartment on the easterly slope of the Magnolia District of Seattle, due west of and within 1/4 mile of the Interbay Marshalling Yards of the Burlington Northern Railroad.

Additionally, I am in the process of building a single family residence in the same area, and as a property owner, I oppose the existing noise level generated by the continual switching and humping of freight cars in these yards. Any increase in noise levels would be intolerable.

Additionally, the Magnolia Community Club is on record with the City of Seattle objecting to the switching of explosives, corrosives and flamable materials in this same yard. An explosion in this yard would level several hundred residences on the sidehills facing the yard on both the East and West.

Copy of an article form the Magnolia News, dated May 30, 1079 is enclosed.

Very truly yours.

ROSCOE C. BURR
Investment Counsellor

79-01-099

~SAHD ANR-490
18 JUN 79 14:23

More noise could assault residential areas here

Residents of Queen Anne and Magnolia who live anywhere near the Burlington Northern railroad yards in Interbay may be in for more noise from those railroad yards than they've known till now.

The Environmental Protection Agency has proposed a new regulation for noise from railroad yards. According to Curt Horner of the Seattle-King County Health Department, the maximum permissable noise levels established in the new regulation will "allow more noise from railroad yards than has ever existed before in the Seattle area."

The regulation does not discriminate between the types of property that will be impacted. Car coupling, retarders and refrigerator cars will be allowed to emit as much noise in a residential area as in an industrial area. Noise from the Interbay yards reaches residential areas both to the east and west.

These residents, says the Health Department, "will find less protection from railroad noise with the new regulation than from currently existing regulations."

In addition to reduced protection from noise, the new regulation mandates some very technical equipment and methodology to measure railroad yard noises.

"Enforcement of the new regulations will require a higher level of expertise than current monitoring criteria," said Department spokesman Horner. "The expense of enforcing new regulations may be crippling to noise control programs that are barely surviving now."

Horner said the new regulations will not aid in maintaining high environmental quality and "may actually be degrading."

Public comment will greatly affect the outcome of the newly proposed legislation. The Seattle-King County Health Department Noise Control Program urges public comments against this proposal. Letters should go to: Rail Carrier Docket No. CNAC 79-01; Office of Noise Abatement and Control (ANR-490); U. S. Environmental Protection Agency, Washington, D.C. 20460.

Post Office Box 179
Augusta, Georgia
4 June 1979

United States
Environmental
Protection Agency
Office of Public
Awareness (A-107)
Washington, D. C. 20460

Gentlemen:

This will acknowledge receipt of your Environmental News for immediate release Wednesday, May 30, 1979 relative to Comment Period Extended On Interstate Rail Carrier Noise Regulations.

I would like to take advantage of this extended time and submit my comments as follows:

The place in question is Asheville, North Carolina. While I have not heard any complaints of noise around the rail yard facilities in Asheville does not mean that there isn't any. However, after the locomotives leave the yards to the main lines through Biltmore, North Carolina is where the noise begins.

79-01-081

Biltmore is in a valley surrounded by mountains and the acoustics is such that the slightest noise can be heard.

The normal noises of a locomotive and its train might not be so bad but the whistle blowing is enough to damage ones hearing. It appears that the engineer wants everyone in the little village of Biltmore to know he is coming through. And if you happen to be talking to someone or trying to get some much needed sleep, you might as well give up until the train is out of ear distance.

I cannot understand why the people there haven't complained before now. Then, again, they may have and the and city fathers ignore their complaints.

I like trains and I like to hear them. I also like good music but I dont want it so loud it will damage my hearing ability.

Again, I want to thank you for permitting me to be a part of EPA.

Sincerely,

John E. Cutshall

John E. Cutshall

CC: City Manager, Asheville, N. C.

JUN 79 10:
814

May 21, 1979
Rail Carrier Docket # ONAC 7901.
U. S. Environmental Protection Agcy,
Washington D.C. 20460

We object to truck impact crushes, day and night, hours of sleep disturbed.
Why not allow local government to make Rules covering night time switching? Allow at least six hours curfew during the night?

Thank you for any consideration given to home owners on Eldridge Avenue in Bellingham, Wash.

Albertine P. Daub
(Mrs. Walter K.)
2811 Eldridge Ave.
Bellingham, Wash. 98225

BOARD ANR-493
25 MAY 79 9:46

DEETS' POLLED HEREFORD RANCH

Ranch address: 3068 Lampman Road, Ferndale, Wash. 98248
Home address: 2107 Eldridge Ave., Bellingham, Wash. 98225

May 21, 1979

Office of Noise Abatement & Control
U.S. Environmental Protection Agency
Washington, D.C. 20460

79-01-048

Dear Sir:

I have lived at 2107 Eldridge Ave. for over forty years, and as time goes on and we are placed under more and more restrictions, I have found that there are those that do not have to adhere to any restrictions at all.

The city of Bellingham has a noise control ordinance which sets a 55 decibel limit for residential districts, but it seems as tho the railroads are exempt from this restriction.

The railroads should be forced to limit the switching of railroad cars to daytime hours, they should not be alowed to switch at night. They should also be forced to limit the noise control decibel to 55, and if they are unable to do so, they should be forced to move their switching outside the city limits. The railroad owns a great deal of property that would be suitable for swithcing, if they were made to use it. They also switch 15 to 20 cars of inflamable material in town nearly every day. These cars are hit so hard when switched, they almost buckle and leve the tracts. It is only a matter of time until they have a serious accident.

I am very much opposed to the way the railroads are alowed to operate in residential districts.

Sincerely yours,

H. C. Deets

H.C. Deets.

[illegible] Bellingham Herald [illegible]

EPA proposes rules for rail yard noise

It is probably bad news for Eldridge Avenue residents that the federal Environmental Protection Agency has proposed noise-control regulations for the nation's railroad yards.

The railroads got to the EPA before the people did. The agency issued the rules in response to a court order won by the Association of American Railroads. The railroad industry sought the order to establish federal noise standards to head off a multiplicity of state and local rules that it feared would hamper operations in rail yards.

EPA's proposed rules won't exactly impose silence on rail yards. Under the proposal, noise from rail yards is not to exceed 70 decibels as measured in nearby developed areas, averaged over 24 hours, beginning in 1982. During any single daytime hour, the noise level is not to average more than 84 decibels, and during any single nighttime hour the average is to be limited to 74 decibels.

The 70-decibel average is a noise level somewhere between the sound of a dishwasher and a car passing 20 feet away. The 74-decibel level is about the sound of a light truck at 20 feet, while the 84-decibel level is that of heavy traffic at 25 to 50 feet.

By comparison, Bellingham's noise control ordinance, which is in the process of being adopted, sets a 55-decibel limit for residential districts and 57 decibels for commercial districts. In anticipation of the federal control over railroad yards, the local ordinance doesn't mention railroad switching noise.

EPA Administrator Douglas Costle said stricter national rules were rejected because they would have cost the industry "several billion dollars per year." As federal environmental rules normally preempt state regulations, he added, "there will be little recourse for the citizens" who seek tougher local standards.

It looks like the only recourse open to Eldridge Avenue residents will be to invest in heavy wall insulation and double-glazed windows. Perhaps they can get an income tax write-off as thermal insulation. Noise insulation doesn't count for much with the feds.

[illegible] TO REPORT

Page 1. [illegible]

Page 2. Letter from [illegible] of the Eldridge Area

Page 3. [illegible] the Pettibone home built in [illegible], 1719 Eldridge Ave.

Page 4. [illegible] pictures: [illegible] trestle [illegible] Pettibone home on the right above the trestle, [illegible] Eldridge Ave., the slide was on the property next door, [illegible] Dr. Van Zandt home who came with the [illegible] Colony from [illegible] in [illegible].

Page 5. Copy of [illegible]

Page 6. Herald reporter's story of [illegible] Eldridge Ave. and [illegible] of Mrs. [illegible]

Page 6. Letter from [illegible] "NOISE" problems

Page 7. Excerpts from Bellingham Herald

Page 9. Some of [illegible] from Seattle PI

Page 10. Site selected by City Council for [illegible]

FEB. 79

The Eldridge District Historical Newsletter is published by the Eldridge Historical Society, the historical committee of the Eldridge Area Residents Association.

It is free to residents of the district, and will be mailed to others who provide a stamped, self-addressed envelope.

Material for publication should be submitted in writing by the 20th of the month to 1807 Eldridge Ave.

NEW TREES AT COLUMBIA

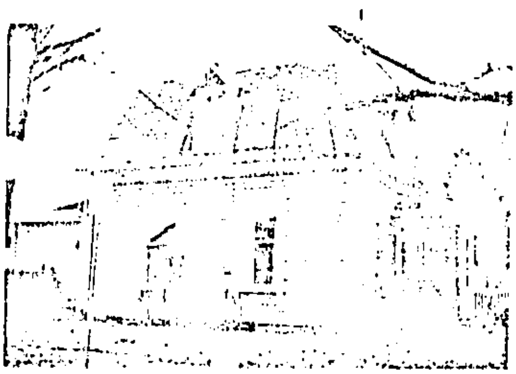
The EARA and Columbia Parents Assn. have planted five early blooming cherry trees beside Columbia School. Watch for the blossoms.

LOBE PARK PLAYGROUND

The EARA executive board met Jan. 22 and voted to eliminate the closure of Henry St. from the park renovation plan. The plan is shown on a separate sheet.

MYSTERY HOUSE

Last month's mystery was solved quickly by many people; our letterhead is copied from the eaves of the Loggie House at 2201 Utter St. Now, what can you tell us about this house?



HISTORY RESEARCH

Pre-1910 information is sought. If you have things to show or tell or would like to help gather history, please call:

Naomi Eastwood - 734-2257 or
Barbara Davidson 734-8782

- NOTES -

Last month's stained glass workshop at Paula and David Cook's was interesting. The Cooks are current owners and renovators of the Austin house, a fact we left out last month. Sorry folks.

\- - -

Power failures happen...and when a disaster occurs, power is cut off to prevent fires. Are you prepared with a flashlight and battery operated radio?

.. .. .. *Coming Events* .. .. ..

Tues., FEB 20th SLIDE SHOW * HISTORY & HUMOR FROM TOMBSTONES OF WHATCOM CO.
7:30 pm at 1717 Eldridge Ave. (The historic Van Zandt House)
Presented by Col. Earle H. Christenson who was instrumental in compiling the 5 volumes of Cemetery Records published by the Whatcom Genealogical Society.

Mon., FEB. 26th - PLANNING MEETING FOR FOURTH ANNUAL EARA HISTORIC HOME TOUR
10:00 am at 1504 Washington St.

This year's tour will be Oct. 13 & 14. If you are interested in planning and helping, come join us. At this meeting we will be selecting committee heads and their committee members.
For more information, call: Paula Cook 734-6114

Tues., FEB 27th - WALLPAPER WORKSHOP
7:30 pm at 2701 Eldridge Ave.
Maintenance, historic patterns, tools, techniques and encouragement.
Presented by Barbara Smith of Bellingham Sash & Door.

Sat., JUNE ~~2nd~~ 23 - ALL DAY FESTIVITIES celebrating our nomination as a National Historic District. The Walking Tour Brochure will be used by many visitors to explore our district between Eldridge Ave. and North St.

The success of this celebration depends on everyone's cooperation.
YOU can help with:

* beautifying your block
* special attractions in the parks

RE:
[illegible] EPA NOISE [illegible]
ELDRIDGE HISTORICAL [illegible] BELLINGHAM WA [illegible]

In behalf of the Eldridge Historical [illegible], I am submitting the following [illegible] for [illegible] study.

The EPA has "LUMPED" the NOISE [illegible] into one [illegible]. Our case is different.

PLEASE NOTE: This area is the oldest residential [illegible] in Bellingham Wa. [illegible] July 28th [illegible] the [illegible] National Register, [illegible] will be in the National [illegible] soon.

Eldridge Avenue district nominated

The Eldridge Avenue Historical District in Bellingham is among the nominees to be included on the National Register of Historic Places this year.

Inclusion on the register can provide certain tax benefits and federal help to maintain and restore structures. A site or area placed on the register also carries some protection against future development of that site or area.

In notification of pending nomination, [illegible] by by the BN tracks. I am en[illegible] one of our [illegible] ing one of our oldest houses, built in [illegible]. Again this house is shown in a picture on top of the [illegible] the switch yard.

I live in an historical house built in 18[illegible], one of the oldest on the bay-side of Eldridge Ave. I am a professional music teacher, and my large Mason Hamlin Grand Piano has been moved to the farthest end of my living room closest to Eldridge Ave. During my teaching time which is usually after school and Sat. mornings, my students have a difficult time with the noise from the [illegible], and many times are so startled from the impacts they jump off the piano bench.

I first came to this house in 196[illegible], each year the noise is worse, and from the violent impacts and the springs [illegible] on my property, I have lost 54 ft. from slides, according to the survey done by BN engineers in 1977. This spring, several property owners lost ground, the last bad slides were in 1971 and 1977.

I am the Historian and present Director of the Eldridge Historical Society, formed in Aug. 1975. I am sending items that are relevant to our SITUATION.

(Mrs.) [illegible]

Eldridge Historical Society
1807 Eldridge Ave.
Bellingham, WA 98225

ELDRIDGE DISTRICT HISTORICAL NEWSLETTER

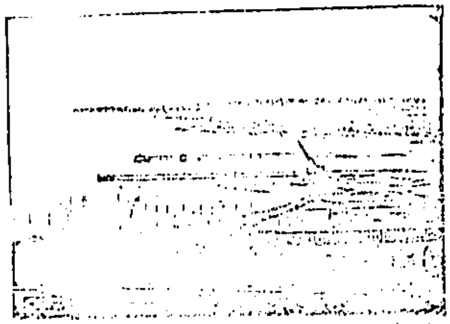
see house on bluff, next page

THE HISTORIC A. W. PETTIBONE HOUSE
(Present Barnes Home)

The Pettibone house at 1711 Eldridge Avenue is directly associated with the most important yet tangled series of legal hassles in Bellingham's early history. The home was built in 1886 by Alfred W. Pettibone and his wife Flora. Flora was the sister of Russel V. Peabody who, along with Henry Roeder, were the first settlers on Bellingham Bay. The two men staked the first donation land claims in the county on ground which became the heart of the downtown area. In doing so, they each gave one third interest in their claim to the other intangling themselves in what became the struggle of the "Peabody Heirs."

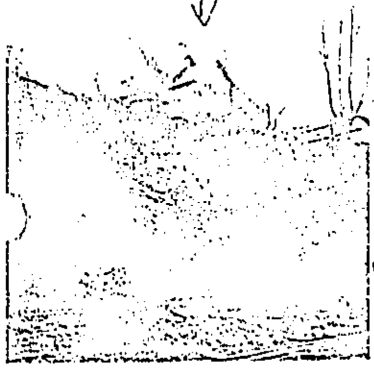
Russel Peabody's claim, which included the mouth of Whatcom Creek, passed to his brother upon his death in 1868. When his brother died in 1873, it became the property of their three sisters, two of whom had married Pettibones and the other a man named Hamlin Briggs Williams. (Williams Street is named for him.) The three women lived in the midwest and took no interest in the land until Roeder got a group of settlers to come out from Kansas and build a sawmill at the mouth of Whatcom Creek. This group arrived in 1882 and among them were several people who built homes in the Eldridge district. The Austins, Inks, Van Zandts, and Collins all came west with the Kansas-Washington Colony. Based on a legally questionable agreement between the heirs, Roeder, and the Colony, a mill was built at the mouth of the creek on ground which the colonists believed was theirs. Its success however, coupled with newspaper articles that claimed that Bellingham Bay was to become the Puget Sound railroad terminus, caused the heirs to back out of the agreement. Then Russel Peabody's half native son, Frank, surfaced with a claim as did William G. Utter. The Pettibones moved west to dispute a solution to the problem which had been reached in June 1883. The quarrel spread to the community and even divided the heirs. John Stenger, the superintendent of the mill, had his house blown up. The local newspaper announced that the heirs were greedy outsiders. Henry Roeder lost all ownership to the site of the original Roeder mill. And in the middle of it all the Pettibones built a house on Eldridge Avenue.

By 1900 the house was owned by lumberman George Cooper. He brought the sapling from England that has grown into the Beach tree in the front yard today. The house was later owned by the Bugge, Pemberton and Youngquist families. The Barnes family has owned it since 1925. The historical significance of the Pettibone house, while not particularly unique within the district, displays the far from commonplace role many neighborhood residences played in the area's past. The graceful home with its curving stairway, leaded glass windows and ballroom basement was host to much social life in the early days.



RR in 1971 - Picture take about 1995

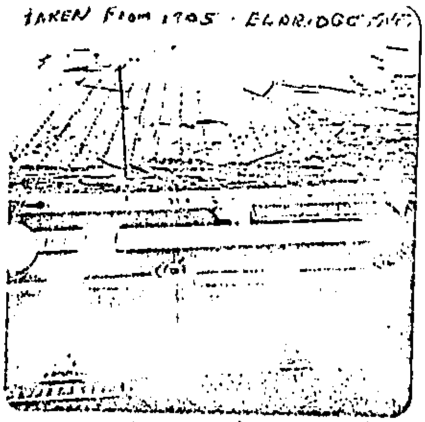
Pettibone Harris 1711 Eldridge



1717 Eldridge
1971 Slide
Dick Van Zandt

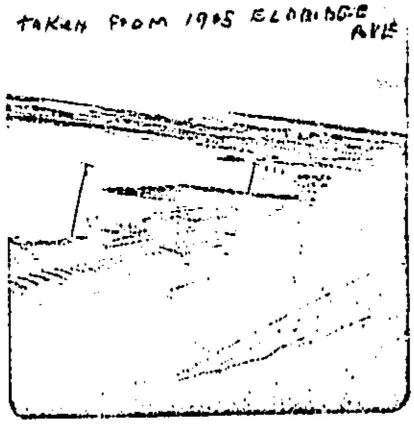
1971 Slide
2300 Block Eldridge

Taken from 1705 Eldridge Ave



Crowded Switchyard (?)

Taken from 1705 Eldridge Ave



Tank Cars 2
tracks

HEALTH AND WELFARE of the ELDRIDGE AREA RESIDENTS

NOISE....POLLUTION.....FEAR

HISTORIC NOTE: In answer to the question who was here first, houses or the RR especially on the bay-side, there were many homes built before the RR was constructed on "fill" below the bluff.

1. NOISE !!!!! Lots of it...day and night..We have true records of RR switchings to prove it.
   SWITCHING....DAY and NIGHT...
   REFRIGERATOR CARS...left on the tracks, motors running for days and nights...
   Engines left to idle for hours and hours, and days. Not only do they create NOISE but vibrate windows etc. in the houses above the tracks.
   REVVING SWITCH ENGINES, day and night
   GRINDING AND SQUEALING BRAKES.....

2. POLLUTION: When engines "REV", one to four of them, the smoke spews out and penetrates our houses, also the fumes from the diesel refrigerator cars creates a health problem.
3. VIBRATION: The road bed was constructed on fill over springs in 1902, it is constantly needing repairs, even with the best they can do, the freight cars sway dangerously from side to side, spikes are loose, and there are constant derailments.
4. FEAR!!!
5. FIRES, many

EXPLOSIONS....CRASHES..... from humping and "FLY" switching
Difficult for students to study, or hear on the telephone, radio and T.V....houses shake, pictures fall off walls, dishes break. windows and wlls crack and one can't tell the difference from a train and an earthquake. Our earth is sand and clay, no rock to absorb the blows.
Even the "FAST" thru trains whose speed has been clocked at 58 miles per hour are doing damage. Half way down the bluff are springs on BN property, the fast trains along with the terrible impacts from SWITCHING have caused many slides, some residents have lost as much as 50 ft.
Homes and propery are valued up in the millions, perhaps billions of dollars along the bluff of Eldridge Avenue.

This Report: "TRAIN OPERATION OBSERVATIONS" is a partial record of the BURLINGTON NORTHERN activities in the crowded switching area 77 years after its construction at the base of the bluff in 1902.

This was made for the ICC

[illegible] Eldridge Avenue [illegible] all it's cracked up to be

By MICHAEL [illegible]
[illegible] Staff Reporter

[illegible] had known then what they [illegible] Ken and [illegible] Lyste would [illegible] have bought their Eldridge Avenue house.

[illegible] were completely ignorant [illegible] what was going on," recalls [illegible] at the time they were [illegible] They ended up buying [illegible] Eldridge Ave.

[illegible] they had themselves one of [illegible] families living on the avenue's [illegible] which overlooks a railroad [illegible] yard.

[illegible] was a good salesman," Mrs. [illegible] said of the real estate man who [illegible] their deal. She explained [illegible] salesman pointed out all the benefits of the neighborhood, but neglected to mention the bad part of it all — the switch yard.

The Eldridge area is a beautiful residential neighborhood, they said. But when it comes to the switch yard, Lyste adds, "Actually, if we would have known, we wouldn't have bought the place."

For those who have never lived under such conditions, Nancy Doering, 1915 Eldridge Ave., explains, "It's like having earthquakes every day."

Residents have petitioned the Bellingham City Council and others for action. More than 350 persons have signed the letter.

Petitions ask that the railroads put a muffler on their operations, correct a poor drainage condition, install a bulkhead to stop landslides, slow down the trains and, in general, go elsewhere.

The drive for action isn't anything new or unique, but only a renewal of past campaigns which ended the same way. Each previous citizen and city effort failed miserably.

In January, 1966, the lead paragraph in a Bellingham Herald story read: "The city council wants someone in city government to sit down sometime, somehow and talk to somebody with Great Northern about something that's been bothering Eldridge Avenue residents for years."

That "something" is still bothering the Eldridge Avenue householders.

"A lot of people have been working on this all their lives and never seem to get anywhere with it," Mrs. Doering said.

Her family has lived on Eldridge Avenue only three years, but she said her difficulties are no different from those of the old-timers in the area.

"We think positive, and this time we're determined to get action," Ken Lyste said confidently.

He added: "We're taxpayers and our house is going over the bank. We want something done about it and it's not a small thing."

But the [illegible], they maintain, take the [illegible] lightly and show little sign of concern for the residents' problems.

"You just can't imagine how loud it really is. It's got to be pretty fantastic here if it can be heard two blocks down," Mrs. Lyste said.

When the trains are being put together or [illegible] in the switchyard along Roeder Avenue, Mrs. Doering said, her house "just shakes and vibrates."

Continuously idling train engines don't make life any easier as the diesel fumes filter into the houses whether windows are closed or not.

Diary tells of life with the railroad

A diary kept in 1971 by Edith Lowman, of 2311 Eldridge Ave., gives a description of life above the railroad switchyard along Roeder Avenue.

Mrs. Lowman wrote:

—Sept. 10 at 10 a.m.: heavy switching on Burlington Northern railroad caused window vibration and loud noise.

—Same day at 4:05 p.m.: repeated noise and switching. The house shook.

—Sept. 12, shortly after midnight at 12:50 a.m. loud crashing of freight cars, house vibrated. No more sleep for hours.

—Same morning, Sept. 12 at 4:35 a.m.: awakened by some switching crashes and windows rattled.

—Same day at 1:05 p.m.: same noise and more vibration lasted for a half hour or more.

—Sept. 16, 6:35 p.m., repeated crashes from switching, windows shaken.

—Sept. 20, 11:35 a.m.: a half hour of heavy switching, noisy crashes.

—Sept. 26, 5:25 p.m.: crashing of freight cars shook sofa in living room on which I was resting. Continued until about 6 p.m. or later.

Sept. 27, switching — felt the house shake.

-16-

The noise, odor, [illegible] and everything else makes sleeping difficult if not impossible.

"It's really hard on the nerves [illegible] live here. I never get a night's sleep all the way through," Mrs. Lyste said.

Mrs. Lyste said she's a light sleeper but Mrs. Doering [illegible] little difference to her.

"I always warn my friends," explained Mrs. Doering. She told of [illegible] day she forgot to tell a guest from Seattle. The visitor was in the house alone for an afternoon and [illegible] Mrs. Doering returned the guest [illegible] of the earthquake that rocked the household.

In reality, the earthquake was the switching on the railroad system.

Mrs. Lyste is worried about her father's heart condition when he visits. Unfortunately, she said, her father is hard of hearing. But on the other hand, that has its benefit as he can't easily be disturbed by the commotion on the tracks below.

The actual peak car-switching period is at night, the residents say. The operation tends to begin about dinnertime and run into the early morning hours.

"This happens daily," Mrs. Doering said, dispelling any thought the disturbance is a rarity.

For the railroad officials and others who maintain the complaining residents are only over-reacting, Mrs. Lyste challenged: "I'd like to see them sleep here one night with the trains going through like normal."

Eldridge Avenue residents on the bayside have indicated they would help cover the costs of upgrading their property. The hillside, they say, is slipping away.

Several years ago, the railroads installed pilings at the foot of the hill. Those pilings, they said, don't correct the problem but they do keep dirt off the tracks.

"It's no point in filling in the top and letting the whole thing slide out from under," Lyste said.

Eldridge residents aren't out to run railroad switching out of business, but they don't believe it belongs bordering the residential district.

"Most of these homes were built before the railroads were in," Lyste said.

"We've put a lot of money and a lot of work into our house. We don't want the value going down because of the railroads," Mrs. Doering said.

The Lystes have also made improvements since they moved in about two years ago.

Unless there's a change in the railroad situation, they won't be making any more improvements because, as Lyste said, it's not worth the trouble.

February
1975

Mrs. WILLIAM L. CARTER
1901 ELDRIDGE AVENUE
BELLINGHAM, WASH. 98225

Mrs. Carter has lived on the "Bayside" of Eldridge Avenue for fifty-five years

We have lived on the "Bayside" of Eldridge Avenue for fifty-five years. Seven of them at 1807 and 48 at 1901 Eldridge where I now reside.

It seems that there have been slides along this area since the right-of-way was given to the R.R. Co. We have lost about twenty-five feet from our lot. The largest one occured about 1929. I cannot be sure o the date, since I no longer have the file which contained a great deal of information on the slide situation. This slide covered both railroad tracks for about half a block. It carried all the trees and every growing thing there.

Our property line between us and the R.R. right-of way is about half way down the bank. It seems the slides, especially the larger ones have been caused by an under-ground spring and seepage which we think is below the dividing line. We have endeavered to help save our bank by planting willows, poplars and vines, only to have them washed away.

At one time the R.R. Co. sought to appease us by putting in a row of not too tall piling, just across the ditch. It ended up with the only ones being helped was the R.R., as it kept some of the soil and debris from going on the tracks; There were four property owners as I recall who were"stuck" for half of the cost.

For some reason much of the switching of cars is done in this area. You would never believe it, unless you heard it, the terrific banging and crashing and bumping that takes place. Much of it seems to be in the middle of the night. Our house is very well built, but it shakes like an earth-quake is taking place. It is this excessive jarring that we believe causes many of the smaller slides.

Many nights the diesels and refrigerator cars are left chugging all night. It not only disturbs our sleep, but gives off an odor, so that we have to keep our windows closed. To continue my"tale of woe", just a few years ago, our whole bank was stripped by a raging fire that would have burned our house if it had not been for the quick action of two passers- by that got our hoses and the neighbors going until the Fire. Dept. arrived. The back of our garage was burned, also all of the shrubbery and trees on the back of our lot.

There was damage to the houses on both sides of us. It was believed that this was started by a passing train. Part of the piling was burned too.

To sum it all up, we are not only constantly losing some of our precious land, but have the noise and air pollution, and vibration and shaking of our house. You may wonder "WHY" do we stay? We have an investment and most of all it is HOME.

Respectfully,

Mrs. W. L. Carter

5

KGMI BULLETIN

Wednesday, March 30, 1977

Concerned Eldridge Avenue citizens have told the city council safety committee of dozens of railroad cars carrying deadly chemicals being switched almost daily on the tracks below their homes. The residents are asking for cooperation in limiting train speed, violent switching and extended periods of parking the potentially explosive carriers. Emergency procedures and clear labelling of chemical tank cars is another goal to be explored.

Tuesday, August 23, 1977 ....BULLETIN KGMI

Attorneys for the Burlington Northern railroad have told the city of Bellingham it faces a lawsuit if attempts are made to restrict switching between 9 p.m. and 7 a.m.

Sept 20 /77

Switching ban ordinance voted

An ordinance to prohibit nighttime railroad switching activities along Roeder Avenue was cut back and given preliminary approval by the Bellingham City Council Monday night.

The proposal was to prohibit switching in Burlington Northern's Roeder Avenue yard from 9 p.m. to 7 a.m., to reduce noise which long has disturbed residents of Eldridge Avenue above the switching yard.

The only railroad switching experts are probably employed by the railroads, Councilman Charlie Lancaster said. "Maybe you can find some retiree who wants to get even," he suggested.

The ordinance passed on a 6-1 vote, with Councilman Fred Veroske in opposition. If final approval is given in a few months, Brock has predicted the city will face a court battle over the regulation.

May 26

"Monday night, it must have been about a quarter after 11, it was just like thunder!" according to Ruth DeMerritt, 1807 Eldridge Ave. "I don't know what it's like anymore to really sleep."

Tuesday night the noise from switching train cars was so great, one of her neighbors ran into the street, expecting to see flames from the train yard below, she said.

Residents complain of "fly switching," in which cars are turned loose to bang into other cars. Their major worries, they say, involve the cars marked propane or chlorine.

May 7, 1975

Eldridge plight

Editor, The Herald:

The residents along Eldridge Avenue are concerned about a number of problems affecting their neighborhood and would like to inform your readers about these problems and seek their help.

What can we do about:

—the fact that Burlington Northern refuses to do anything, and has refused for 50 years, to do anything about (a) the day and night switching noises, (b) the pollution from the engines, (c) providing drainage for underground springs and run-offs along the bank, (d) providing a bulkhead to prevent land slippage, and (e) reducing the speed of trains to the legal limit to stop the vibrations which shake the homes adjacent to the tracks day and night.

Eldridge residents have been working on these problems, some for many years, and now we are setting up a citizen organization to save our neighborhood. We are fighting to put people and neighborhoods first in Bellingham. If anyone would like to join us, or has ideas on how to solve these problems, just let us know.

Eugene Hogan
1621 Eldridge Ave. PXD

Ec [illegible] on Poverty ? April 1979

1976

BN building new Colville sawmill

COLVILLE (AP) — A new sawmill that will eventually have a production capacity of about [illegible] million board feet a year will be constructed here, The Burlington Northern, Inc., says.

The BN said Tuesday it has budgeted $73 million this year to begin preliminary engineering, but "the date for starting construction will depend on lumber market conditions."

The plant will replace the former Del Shoat Sawmill, purchased by BN in 1973 and destroyed by fire in May 1974.

The mill will be operated by the company's timber resources subsidiary, Plum Creek Lumber Co.

[illegible] 1977

LAND PURCHASED-Three large tracts of land in Whatcom County have been purchased by the Glacier Park Co. of Seattle, a subsidiary of Burlington Northern Railway.

A 57-acre parcel located on the corner of Grandview and Jackson Rds. was bought for $2,500 from Leonard Unruh, Rt. 1, Blaine. The company also purchased a 35-acre farm belonging to Walter Weibe, Rt. 1, Blaine, for $1,700. It is located on Grandview Road between Point Whitehorn and Jackson Roads. Another 38-acre parcel in the same area was purchased from Pete Wittenberg, Blaine, for $152,600.

Whatcom County
near Bellingham

Some of their
investments

[illegible] OF [illegible]
1979

Burlington Northern

Despite cold weather which pushed operating expenses [illegible] percent higher than a year ago, Burlington Northern has [illegible] a first-quarter earnings increase of [illegible] percent over the same period of last year.

For the quarter ended March 31, the St. Paul company earned [illegible] million, or [illegible] per share, compared to last year's [illegible] million or [illegible] per share. Revenues increased [illegible] percent to [illegible] billion in 1979, compared to [illegible] billion in the prior year's quarter.

Other Burlington Income

LOS ANGELES — (AP) — Burlington Northern [illegible] Inc., known mostly for its railroad [illegible] is [illegible] [illegible] about a [illegible] of its [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] the firm's chief executive says.

[illegible] W. Meck [illegible] Burlington Northern [illegible] said he would [illegible] the base built in [illegible] [illegible] areas grow to [illegible] or more of the concern's income.

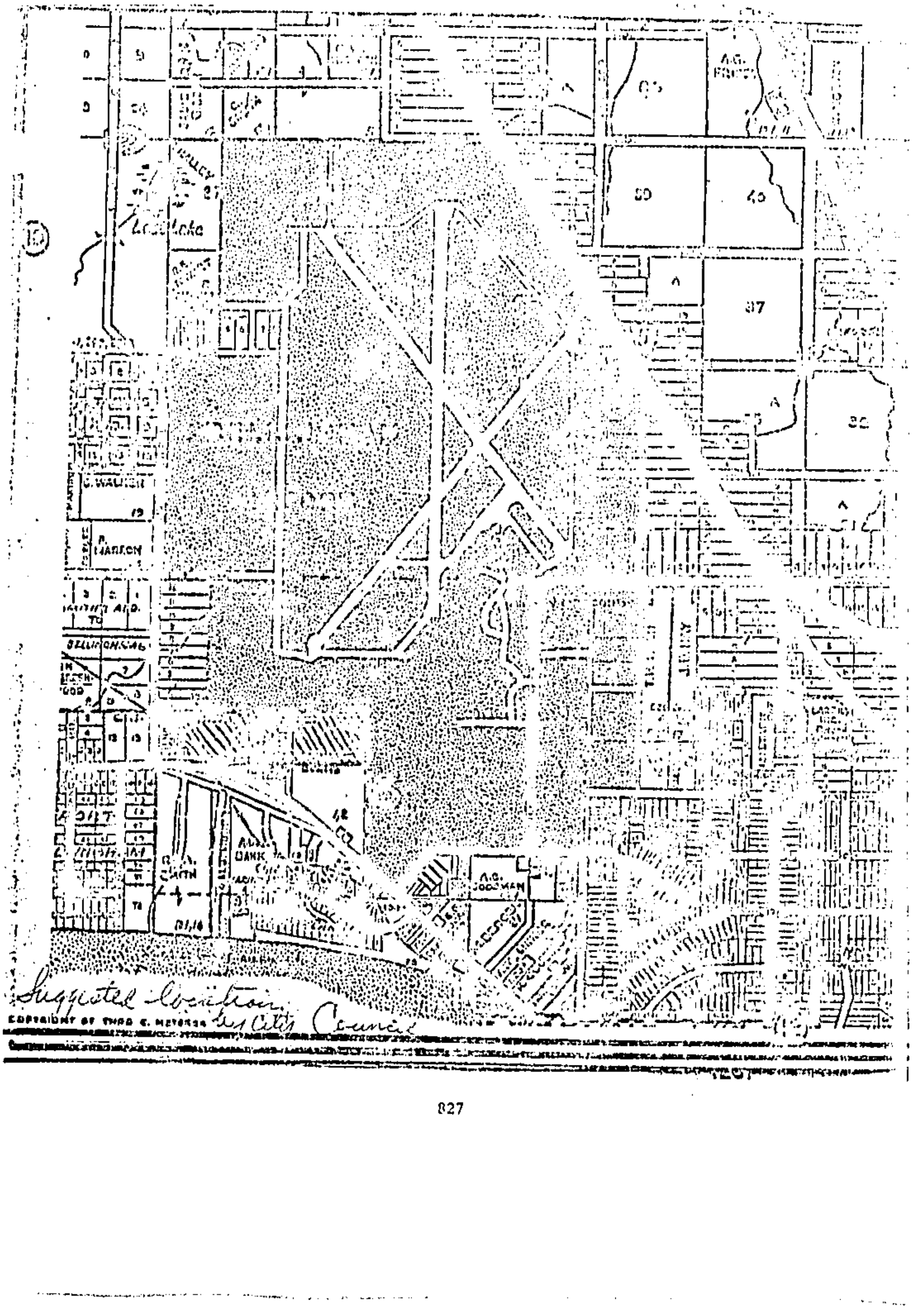
The company already has an [illegible] investment in the [illegible] recreational development, headed by former television newscaster Chet Huntley.

Meck said he envisions further investments in ski resorts, planned communities and shopping centers.

BN to Build In Minneapolis

MINNEAPOLIS, Minn. — (AP) — Burlington Northern, Inc., said it will spend between [illegible] million and $[illegible] million to develop a proposed [illegible]-acre redevelopment area in downtown Minneapolis.

Burlington officials announced at a news conference the project could be under construction within three years and completed in 10 years.


Lost Lake
A.G. PRITZ
C. WALKER
A.G. GOODMAN
Suggested location
by City Council
COPYRIGHT BY THEO C. METSKER

THIS CONCERNS YOU!!!

(Please read all the article)

- MAY 30, 1979 - QUEEN ANNE NEWS

More noise could assault residential areas here

Residents of Queen Anne and Magnolia who live anywhere near the Burlington Northern railroad yards in Interbay may be in for more noise from those railroad yards than they've known till now.

The Environmental Protection Agency has proposed a new regulation for noise from railroad yards. According to Curt Horner of the Seattle-King County Health Department, the maximum permissable noise levels established in the new regulation will "allow more noise from railroad yards than has ever existed before in the Seattle area."

The regulation does not discriminate between the types of property that will be impacted. Car coupling, retarders and refrigerator cars will be allowed to emit as much noise in a residential area as in an industrial area. Noise from the Interbay yards reaches residential areas both to the east and west.

These residents, says the Health Department, "will find less protection from railroad noise with the new regulation than from currently existing regulations."

In addition to reduced protection from noise, the new regulation mandates some very technical equipment and methodology to measure railroad yard noises.

"Enforcement of the new regulations will require a higher level of expertise than current monitoring criteria," said Department spokesman Horner. "The expense of enforcing new regulations may be crippling to noise control programs that are barely surviving now."

Horner said the new regulations will not aid in maintaining high environmental quality and "may actually be degrading."

Public comment will greatly affect the outcome of the newly proposed legislation. The Seattle-King County Health Department Noise Control Program urges public comments against this proposal. Letters should go to: Rail Carrier Docket No. CNAC 79-01; Office of Noise Abatement and Control (ANR-490); U. S. Environmental Protection Agency, Washington, D.C. 20460.

"MORE NOISE............

"Public comment will greatly affect the outcome of the newly proposed legislation."

"The Seattle-King County Health Dept. Noise Control Program urges public comments against this proposal. Letters should go to:

Rail Carrier Docket No. CNAC 79-01

Office of Noise Abatement and Control (ANR-490)

U.S. Environmental Protection Agency,

Washington, D.C. 20460."

WRITE A LETTER -- NOW!

YOU,

YOUR NEIGHBOR,

YOUR FRIENDS,

And/or write your Senator, Representative, (in Washington, D.C.)

"MORE NOISE........" -- we do not need.

June 8, 1979

Rail Carrier Docket No. ONAC 79-01
Office of Noise Abatement and Control (ANR-490)
U.S. Environmental Protection Agency
Washington, D.C. 20460

79-01-098

Sirs:

Refer to the enclosed article from the Magnolia-Queen Anne News in Seattle.

This subject affects thousands of residents on both sides of the Interbay area which contains the Burlington Northern railroad yards. There are absolutely no buildings on either side of the yards to buffer the noises. The noises are of very high intensity and persist or are intermittent noise during 24 hour days and seven day weeks. It is so loud and persistent as to be very damaging to the nervous system and so very damaging to health....ask my doctor.

We have gone to the Seattle office of Burlington Northern to explain our problem and learned they are well aware of it, but they are afraid it would take quite a lot of money to correct!

Over the months and years Kurt Horner of the Seattle-King County Health Dept. Noise Control Program has held out hope that regulations would be changed to give us all some welcome and much needed relief. Now he reports that your department is about to approve a new regulation that would allow more noise to help ruin the nerves of thousands of taxpayers who surely are entitled to more out of life than this.....INTOLERABLE!!

Please deny this regulation and work on a new one that will give us the relief to which we certainly are entitled.

Hopefully yours,

J. K. Fraser

J. K. Fraser
2215 W. [illegible] St. [illegible]
Seattle, Wa. 98199

ANR-490
14 JUN 79 15: 48

More noise could assault residential areas here

...ts of Queen Anne and ...agnolia who live anywhere near the Burlington Northern railroad yards in Interbay may be in for more noise from those railroad yards than they've known till now.

The Environmental Protection Agency has proposed a new regulation for noise from railroad yards. According to Curt Horner of the Seattle-King County Health Department, the maximum permissable noise levels established in the new regulation will "allow more noise from railroad yards than has ever existed before in the Seattle area."

The regulation does not discriminate between the types of property that will be impacted. Car coupling retarders and refrigerator cars will be allowed to emit as much noise in a residential area as in an industrial area. Noise from the Interbay yards reaches residential areas both to the east and west.

...se residents, says the Department, "will find ...protection from railroad noise with the new regulation than from currently existing regulations."

In addition to reduced protection from noise, the new regulation mandates some very technical equipment and methodology to measure railroad yard noises.

"Enforcement of the new regulations will require a higher level of expertise than current monitoring criteria," said Department spokesman Horner. "The expense of enforcing new regulations may be crippling to noise control programs that are barely surviving now."

Horner said the new regulations will not aid in maintaining high environmental quality and "may actually be degrading."

Public comment will greatly affect the outcome of the newly proposed legislation. The Seattle-King County Health Department Noise Control Program urges public comments against this proposal. Letters should go to: Rail Carrier Docket No. CNAC 79 01; Office of Noise Abatement and Control (ANR-490); U. S. Environmental Protection Agency, Washington, D.C. 20460.

2715 Eldridge Ave.
Bellingham, WA 98225
May 20, 1979

Office of Noise Abatement & Control
U.S. Environmental Protection Agency
Washington D.C. 204060

Dear Sirs:

We strongly protest the proposed regulations governing noise levels in railway switchyards. They are not strong enough.

We live in a National Historic District. Most of our houses were built before the railtrack was switched from a trestle in the bay to the land under the bluff where our homes are located.

The new regulations are detrimental to the quality of life in our neighborhood. Already the noise levels are very high and the new regulations give the railroads free rein to make more noise.

Our local community has set a standard of 58 decibels. That is where it belongs. Please do not undermine local government. We know and understand the situation here as Washington D.C. officials cannot.

We are not protesting the noise levels of the trains that run on the track, although they are quite high. We are protesting the unnecessary noise due to switching. The rail personnel can take care in switching and considerably reduce the noise. This has been proven to us as we have protested this matter and with the help of our city government have reduced the noise levels somewhat. Now you are in effect telling the railroads they do not have to respond to public pressure.

On the one hand the federal government asks us to preserve our historic neighborhood by granting us historical district status. On the other hand it takes away the protection we need to keep this neighborhood a decent place to live.

Through the efforts of our neighborhood organization and local officials, we have turned this neighborhood around in the past 5 years from an older neighborhood sliding into a slum to and attractive desirable place to live. Now with the likelihood of excessive noise levels again, people will once again seek to flee the area. Has big indeustry shafted the people again? Please amend your regulations to let local standards apply.

Sincerely

Mr. & Mrs. J.W. Freudenberger

Mr. & Mrs. J.W. Freudenberger

MAGNOLIA MICROSYSTEMS

3214A ~~W. McGRAW SUITE 7~~ SEATTLE, WASHINGTON 98199 (206) 285-7266
New address: 2812 Thorndyke Avenue West

May 30, 1979

Rail Carrier Docket No. CNAC 79-01
Office of Noise Abatement and Control (ANR-490)
U. S. Environmental Protection Agency
Washington, D. C. 20460

I live and work in an area near the Interbay railroad yards in Seattle. I understand that the proposed noise regulations allow noise in excess of that currently permitted under local regulation, and will not make any distinction for the character of the neighborhood in which the railroad yard is situated. Since this will have an effect on my life very close to 24 hours a day, I strongly protest any situation which will allow an increase in the amount of noise I will be surrounded by.

I would hope that the regulations promulgated would not in any way restrict the rights of local communities to regulate more tightly, and by methods which are currently in use in this and other local communities. A regulation which places limits on the amount of noise allowable is of significant value in areas where limits do not already exist. However, the regulation should not limit the rights of local communities which already have more stringent regulations for the protection of the health and welfare of it's citizenry as well as to preserve the character of existing neighborhoods. This should allow the continued enforcement by local communities of noise pollution ordinances by whatever means have been found to be satisfactory in the locality.

It would indeed be ironic if the result of actions taken by your agency increased the amount of noise that surrounds us in our homes and offices. I sincerely hope that you will be able to avert that result.

Sincerely,

Bradley Keith Gjerding

cc: Curt Horner, Seattle-King County Health Department

79-01-0782

RECEIVED ANR-490
6 JUN 79 14: 33

K.L. COLLINSON GJERDING

ATTORNEY AT LAW

~~3214A W. McGRAW SUITE 6~~ SEATTLE, WASHINGTON 98199 (206) 285-7270

New address: 2812 Thorndyke Avenue West

May 30, 1979

Rail Carrier Docket No. CNAC 79-01
Office of Noise Abatement and Control (ANR-490)
U. S. Environmental Protection Agency
Washington, D. C. 20460

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Sincerely,

K.L.C. Gjerding

K. L. C. Gjerding

79-01-067

BOARD ANR-490

5 JUN 79 15:52

833

June 8, 1979

U.S. Environmental Protection Agency
Office of Noise Abatement and Control
ANR 471
Washington, D. C. 20460
ATTN: Surface Transportation Branch

Dear Sirs:

I am concerned with what seems to be a problem of excessive noise made by certain railroad diesel electric locomotives. I am concerned about this noise not only in my role as a railroad employee (which would possibly concern OSHA), but on behalf of the public at large. I am sure there are thousands of Chicago area commuters as well as others who have wondered why the engines that pull their trains must make so much noise (with the main diesel engine reving at full RPMs even with the train sitting still at various stops and in the downtown stations under the train sheds). Because the public at large comes into the proximity of all this noise, I am not speaking of just an occupational annoyance or hazard.

79-01-047

I inquired at the Federal Railroad Administration Office in Chicago and was told their jurisdiction in the matter. A Mr. George Butaud explained to me the jurisdiction of his agency on this matter as follows: His agency regulates railroad companies and their equipment only; not manufacturers of railroad equipment or locomotive builders or their products before purchase by a railroad company. When I saw him, Mr. Butaud had just returned from making an inspection of one particular locomotive about which a complaint had been made concerning the very thing I am concerned about. His inspection had found the locomotive within legal limits for noise based on the criteria for noise that his agency must use. I gathered that this locomotive he inspected was just barely legal. I wish to make the point that with a lot of similar equipment in use - every unit being barely legal - the sum total constitutes quite an annoyance or hazard.

As a railroad employee, perhaps I can shed some light (for a layman's understanding) on why newer commuter train engines as well as Amtrack engines must maintain full RPMs when the train is standing still as well as underway under full power. You see, these particular engines are coupled to newer type commuter coaches and/or newer Amtrack equipment such as Amfleet or Superliner coaches which are equipped with all-electric accesories such as heat, air-conditioning, lights, automatic door openers, and other devices for which a source of power is needed throughout the train - for the comfort of passengers.

The main diesel engine (which is used to move the whole train) is also used to turn a generator (or alternator) which supplies power at a constant voltage for the auxilaries mentioned above in the coaches. The necessity to maintain a constant voltage for the auxilaries is the reason for the constant high RPM of the main diesel; even though while the train is stopped, the main diesel is under very light load (not driving the train, but only powering the auxilaries). This is a good system except for the constant noise and perhaps excess fuel being burned maintaining that high RPM.

I want to strongly suggest that all this constant noise is not necessary; that the main diesel engine could be idled down to a much lower RPM when not under full power (moving the train), and still maintain the proper voltage and power necessary for the auxilaries. I am not an electrical engineer or a cost expert, however I feel the technology must exist and some cost would be worth it to install a device such as a voltage regulator in the auxilary power system to allow the main diesel RPMs to be variable. After all, my 1972 automobile has a solid state voltage regulator about the size of a pocket calculator which allows my automobile engine and alternator to vary in RPMs from very fast at highway speeds to idle speed at a stop sign, while still maintaining a constant voltage for the lights and other electrical things on my automobile to operate properly. With a railroad diesel electric locomotive, the power required for the auxilaries is much, much greater, but still small when compared to the main use of the diesel engine - to move the train.

Do you think your agency could investigate the feasability of a voltage regulator type device for use in locomotives to alleviate the constant noise problem? I'm suggesting that locomotive builders,such as the Electro-Motive Division of General Motors at LaGrange, Illinois, could be saving some cost to themselves or to the buyers of locomotives by not installing such devices irrespective of the noise people must put up with anywhere in the proximity of these locomotives.

Yours Very Truly,

Dennis M. Hale

Dennis M. Hale
5347 S. Merrill Ave.
Cudahy, Wisconsin 53110

June 7, 1979

Rail Carrier Docket No. CNAC 79-01
Office of Noise Abatement & Control (ANR-490)
U.S. ENVIRONMENTAL PROTECTION AGENCY
Washington, D.C. 20460

Gentlemen:

This is in regard to the newly proposed regulation governing noise from rail yards. I strongly urge you to reconsider and not allow the adoption of this proposed regulation. As one who lives west of the Interbay yards in Seattle I'm fully aware of the present noise pollution in the neighborhood. While it is generally a very desirable area in which to live, any increase in noise pollution from the rail yards would certainly be a detriment to the environmental quality.

At this point in time when there is so much public concern regarding environmental quality it seems to me that it would be very thoughtless and insensitive to permit a higher level of noise. In my opinion it would be backward step.

Yours very truly,

D.L. Holce

Ms. D.L. Holce
2223½ W. Armour
Seattle, WA 98199

79-01-094

NOTES: June 11, 1979

Dear Sirs—

I am a concerned citizen writing to you in regards to the proposed new regulations for noise from railroad yards.

I am presently living 3 miles from a busy railroad yard that emits a very uncomfortable level of noise. I am against any sort of pollution—including noise pollution. It greatly affects the well being of the human mind.

I am urging you to reconsider such proposed regulations that would allow for an even greater noise level.

Please.

Thankyou.

Sincerely,

Shawn Hubbard
1131 Olympic Way W.
Seattle, Washington
98119

ONAR-79-01-223

HENNEPIN

MEDICAL CENTER
701 Park Avenue South
Minneapolis, Minnesota 55415

11 May 1979

Rail Carrier Docket ONAC 79-01
Office of Noise Abatement and Control (ANR-490)
US Environmental Protection Agency
Washington, DC 20460

re: Proposed EPA Revision to Rail Carrier Noise Emission Regulations

Dear Sir:

Thank you for the opportunity to express my views relating to the proposed alteration in regulations so as to remove railroad noise sources from local control. Please understand that the views expressed are my own and do not necessarily reflect those of the Medical Center or the County of Hennepin.

79-01-014

It is my feeling that fixed noise sources remain in specific states and should be regulated (or not regulated) according to the local noise control prerogatives. This position is consistent with that of the EPA prior to the US Court of Appeals (DC Circuit) ruling that required EPA to develop the new proposal (this revision).

Rather than take away local regulation for those states having noise control rules, it would be preferrable to ask Congress to allow states to have jurisdiction over fixed noise sources, whether for railroad noise sources or whatever. A letter to this effect has been sent to my Minnesota Congressional Delegation and to the President; a copy is enclosed. A rationale is developed in more detail in that letter.

Sincerely,

David Johnson

David Johnson, MS, MA, CCC
Audiologist
Dept. of Otolaryngology

enclosure

-S&HD ANR-490

17 MAY 79 13: 45

HENNEPIN COUNTY

an equal opportunity employer

HENNEPIN

MEDICAL CENTER
701 Park Avenue South
Minneapolis, Minnesota 55415

Copy Directed to Minn. Cong. Delegation and to the President

May 11, 1979

Dear :

RE: EPA vs Local Prerogatives for Railroad Noise Control

As an audiologist concerned with the hearing health care of my patients, I take especial interest in noise control, simply because we are literally bathed in sound from the moment of conception. "Sometimes the water gets too hot!" We have all experienced unwanted sounds that we do not appreciate, just like scalding water. That lack of appreciation probably reflects a myriad of physical problems induced by noise, ranging from the physical destruction of the hair cells of the inner ear to things like blood pressure changes, mental fatigue, and the like, or even dizziness. As an audiologist, I am not only interested in helping the hearing impaired to better hearing acuity but I am also interested in their and our quality of life. This includes concern over the quality of sound in the environment. This concern relates to an issue which I will address here and which perhaps only you as a legislator can deal with. Please understand that the views expressed here are my own and do not necessarily represent those of the Medical Center or the County of Hennepin.

Background. The Congress in the Noise Control Act of 1972 set in motion a number of actions which attempted to control noise sources in the environment. Section 17 specifically required EPA to deal with railroad source noise. EPA ultimately promulgated rules relating to locomotives and rail cars as noise sources, interpretting its role as one relating to noise control of interstate rolling vehicles and the role of localities as one of jurisdiction over local noise problems such as crossings, car yards, and other fixed physical facilities.

The Association of American Railroads on behalf of the rail industry brought the rules to court arguing that the rules were not stringent enough. The railroads called on the court to order EPA to develop rules which cover local geographical noise problem areas as well as those traveling noise sources already covered by previous EPA regulation. The effect of such a national rule would be to give uniformity across the country to noise control efforts for all railroads equally, but at the same time would be to limit localities from enforcing sometimes more stringent local standards of noise control since EPA rules would supercede local ordinance or state statute. The US Court of Appeals (DC Circuit) ruled in favor of the Association of American Railroads in August 1977.

Present Situation. After several delays, the EPA has come up with proposed rules to accomplish precisely what the Association of American Railroads asked. The EPA has essentially come up with standards for all rail yards including hump yards. The allowable noise levels under the proposed standards are of course open to criticism since community standards of noise and location of major rail yards vary across the country. This is precisely the problem: Minnesota standards for noise very well may differ from those of Wyoming or New York or California or Texas or whatever, simply because our population density and our state's sophistication in noise control may differ from other states. Yet, EPA's action by court order will eliminate our state's control over our noise sources. In addition, EPA in distant Washington, DC, will be responsible for enforcement in Minnesota and in all other states--a big job!

Legislative Relief. Unlike some today, I am not necessarily opposed to big government when it can adequately serve the people. But, I am opposed to the federal monolith when it cannot deal as effectively with local problems as can the individual states themselves. The recent Three-Mile Island affair with nuclear control by the federal bureaucracy, the problems with the FDA lowering our Minnesota standards of hearing aid health care by bureaucratic decree and eliminating Minnesota control over charlatans in the process, and similar federal agency actions which have actually prohibited our local governments from dealing with our local and very real problems, demonstrate that Congress and the President need to act to preserve local prerogatives for local government control over local problems.

It is my feeling that the EPA is justly and appropriately concerned over interstate noise sources. At the same time it is my feeling that the EPA should not have jurisdiction over railroad noise sources of the switching yard or hump yard variety. I believe that legislation is needed to modify the Noise Control Act of 1972 so that local prerogatives for noise control and enforcement remain at the state level. Such a belief is also consistent with keeping the costs of government down during this time of continuing inflation. As a Minnesotan concerned in these matters, I would encourage you and your staff to evaluate this situation and propose appropriate legislative remedy as indicated.

Sincerely,

David Johnson, MS, MA, CCC
Audiologist
Department of Otolaryngology

DJ:bb

8821 Tweed
Houston, TX 77061
May 1, 1979

Rail Carrier Docket ONAC 79-01
Office of Noise Abatement and Control (ANR-490)
U. S. Environmental Protection Agency
Washington, DC 20460

Gentlemen:

Thank you for the opportunity to have some input into the proposed noise amendments for railroads.

My only experience has been with the Atchison, Topeka and Santa Fe Railway; and I can say that if all railroads operate the same way that this one does, many people in the United States have had their lives made miserable and their property destroyed.

In the early 70's the Santa Fe Railway purchased property on the south side of the Allen Farms Subdivision in HOuston, Texas. They built a piggy back and containerized freight depot across Brisbane Street, a street which had homes on the north side of the street. Actually, the freight depot is approximately a city block off Brisbane in some points, though the parking area for the trucks which haul the freight comes right up to Brisbane at some points.

These people installed a diesel powered hoist to lift the freight from the flat cars and onto 18 wheelers. This thing is very noisy and runs all night long. In addition, there is the banging of the cars as they switch and the squeeling of the wheels.

A Mexican American family, the Cadenas, owns 4 acres north of Brisbane, which abuts the Santa Fe property. This MESS is built right up against their property. How they ever get any peace is unknown to anyone. The railroad people have tried to drive them from their property so that they would have a solid piece of property not divided by anyone else's property. I understand that they have offered to buy the Cadena property, but he has owned it for many years and does not wish to sell, Therefore, they have shown him no mercy.

Neither have they shown any mercy to the rest of us. They could easily have developed this area so that it would not interfer with the residential neighborhood, but they have done everything so that it disturbs to the utmost.

I first requested in 1974 that they construct some sort of noise barrier or do something to curtail the noise of the deisel hoist. They have done nothing. They have said that they wish to be "good Neighbors"; yet they have continued to disturb us to the maximum.

We are unable to open our windows at night. We must run air conditioning when there is no need for it because the windows cannot be open because of the noise generated by this freight depot. We have reported this to the city of Houston, but their noise control ordinances are very weak and individuals in that department seem to be unwilling to face up to the railroad.

We have suffered a loss of about $40,000 in the value of our property as opposed to what it would take for us to replace it on Houston's home market today.

In addition to the hoists that operate at the containerized freight and piggyback freight depot, there is another hoist that lifts cars from the trains and onto the trucks of Auto Transport.

In the event that you may be interested in the total scope of the damage done to the Allen Farms Subdivision by the Sante Fe Railway, I am sending a copy of a letter I wrote earlier to the local office of the EPA. I do not beleive that the document under consideration will cover everything mentioned in the earlier letter, but perhaps there are some more items there that should be considered.

Sincerely,

Wanda Kirby

Wanda Kirby
(Mrs. Bill Kirby)

8821 Tweed
Houston, TX 77061
January 23, 1979

Environmental Protection Agency
6608 Hornwood
Houston, TX

Gentlemen:

My home is located at the corner of Tweed and Brisbane Streets in Southeast Houston. My husband and I have resided in it since June, 1960. There are 6 homes on Brisbane, which extends for a distance of 3 blocks off 8800 Telephone Road.

Of the other five homes, two are inhabited by original residents of the subdivision, which is about 30 years old. One of the other owners has been in the home about 10 years, and the other owners have been there a shorter period of time.

The name of the subdivision is Allen Farms.

Some years ago, the Atchison, Topeka and Santa Fe Railway began acquiring parcels of vacant property surrounding the subdivision on 3 sides. They first constructed some industrial plants on the north side of the area. Strangely, they began their construction at the nearest point to the subdivision, not in the hundreds of vacant acres a further distance away.

Then, in the early 70's they acquired the large tract of land on the south side of Brisbane Street, a narrow asphalt street, which deadended at the third block off Telephone. The railroad then ran a track from Mykawa Road to Telephone and constructed a freight terminal. They widened Brisbane for a short distance off Telephone and made an entry into their freight facility. Since construction began on that facility, there has been nothing but continual disruption of the lives of the people who live along Brisbane Street--and to a lesser degree to the other residents of Allen Farms.

To unload containerized freight from the trains, they make use of a large diesel contraption. This thing runs all night long and makes a loud noise. In addition, freight cars bump all night long. Since bedrooms are generally on the south side of homes, sleep is virtually impossible. In addition, trucks running across the shell-surfaced area cause a cloud of white dust, which covers cars, houses, plants, pools, etc.

During the years I have registered many, many protests with the local railroad people, with my councilman, with the city council as a body, and with every possible government agency that I could think of. My husband and I have talked with the EPA on at least two occasions, but we were unable to get much help there. However, we now believe that there may be stronger environmental standards that may give us some relief.

I did not think that the situation could be made any worse than it was with the freight terminal; however, approximately two years ago, I was proven wrong. In the fall of 1976 construction began on the widening of Brisbane Street, installing of curbs and gutters, and paving with concrete. (This work was under the auspices of the Santa Fe Railway. Some have said that it was a joint project of the City of Houston and the railroad. I do not know what the financial arrangements were, but that might be an interesting story in itself.)

The sole purpose of the widening of the street was to use that street (formerly a strictly residential street) for access to a large tract of land at the end of Brisbane, which the railroad had leased to Auto Convoy Company.

It took residents some time to discover the reason for the street widening as everything was always done on a hush, hush basis. <u>At no time did any representative of the Santa Fe Railway every consult with any of the residents of Allen Farms to get any input into any sort of a plan to preserve this residential area.</u>

Please understand there were hundreds of acres through which an access could have been constructed and which would have not been destructive to the residential environment. Therefore, this was a case of gross insensitivity on the part of the decision makers at the railroad.

In August, 1978, I counted the number of 18-wheelers that passed my home from 6 a.m. to 11 p.m. and discovered that there were 106 of them. They pass within 20 feet of my home. These trucks begin rolling as early as 4 a.m. or even earlier. Sometimes they run all night. Their parking area is so close that they are shifting gears as they pass our bedrooms on the south side of our home. We are awakened every morning by this sound. The heavy weight of these loaded trucks--They are loaded with autos and trucks and probably weigh at least 50,000 pounds--causes our house to vibrate. Our bed quivers; the desk at which I am typing this letter shakes.

We have had considerable structural damage to our home as a result of the vibrations caused by these trucks Within the past two years, we have been plagued by cracking walls, sticking doors, etc. In addition, the market value of our home has decreased. At the same time, the cost of other housing has increased drastically in the Houston area.

Drive-out crews employed to drive autos to local dealers cause a considerable problem by throwing litter in the yards and along the street. The drivers drive the cars out of the Auto Convoy lot at the end of Brisbane. They park along Brisbane and wait for their entire group to assemble; they then leave in a convoy. While they wait, they eat snacks, drink sodas, and throw their debris on the ground. During the summer they get out of the cars and sit in the shade of the trees in the yards. We residents have been unsuccessful in our attempts to get this problem corrected. There are other routes out of the industrial area, which do not pass houses. They could use those streets, not Brisbane Street.

After many letters and phone calls to the local people at the Santa Fe Railway, I finally wrote the president, Mr. Larry Cena, 80 East Jackson Boulevard, Chicago, Illinois 60604. I wrote him on July 16, 1978. He replied that he was ordering an investigation; however, no relief was forthcoming. In fact conditions worsened to the point that they were totally unbearable. In August, 1978, new construction began. In October construction was going on around the clock. Dump trucks roared up and down Brisbane Street all night long. We were eating tons of dust; everything was covered with it--cars, plants, houses, boats--everything.

I phoned Mr. Gibson of the Houston office. He told me the first full truth that I had ever heard from anyone connected with the Santa Fe Railway. He said, "It is not going to get any better." He stated there would be more and more truck traffic on Brisbane Street. In desperation I called Mr. Cena on Saturday, October 14. He asked what I wanted him to do, and I suggested that the railroad buy the houses along Brisbane. He seemed very receptive to that suggestion. I thought our problem was solved.

The next week, however, Mr. Fitzgerald of Amarillo and Mr. Grader of the Houston office came to our home. They used all of the usual terms that one hears from the railroad. Primarily, We want to be good neighbors.

Mr. Tom Plant, Director of Real Estate, at the Chicago address was given the task of resolving the problem. He seemed to be genuinely sincere in his efforts to try to alleviate the problems that had been caused by the railroad. On several occasions we discussed the possible remedies to the problem. Among the things he mentioned as possible solutions were the following:

1. Purchase the homes on Brisbane and construct some sort of a noise barrier there to buffet the rest of Allen Farms.

2. Move the homes on Brisbane to alternate locations and construct the noise barrier as mentioned above.

3. Close Brisbane to truck traffic and construct a noise barrier on the south side of Brisbane to buffet the subdivision from the train and loader noise.

A noise and vibrations engineer was hired by the railroad to make studies of noise and vibration levels. They would supposedly use his study as a basis for their decision as to which of the remedies above to use.

Incidentally, they also had this engineer to make studies of the airplane noise from Hobby Airport. At the time he came out the main runway was being worked on--it still is--and traffic was unusually heavy at the runway that causes the most noise in Allen Farms. This is a temporary situation.

On Tuesday, December 19, Mr. Plant called to say that the engineer had been hired to do this study. His name is Jerry M. Cottingham, 2011 Crescent Shore Drive, LaPorte 77571. Mr. Plant promised to get back with us to let us know what the railroad's next step would be. We have heard nothing further from him.

On Monday, January 22, my husband called Chicago to talk with Mr. Plant. He was out of his office and did not return the call. On Monday evening, Mr. Grader, our good neighbor from the Houston office called to see what Mr. Kirby wanted. He said that Mr. Plant was leaving the railroad, so there was no further reason for our talking to him. I told him that we wanted to know what the railroad planned to do to alleviate the problems on Brisbane.

According to Mr. Grader, this is what the railroad plans to do about our declining property values, our cracking walls, our failure to get any sleep at night, our inability to open our windows ever because of all of the outside disturbance:

1. Ask the city to remove a stop sign at the corner of Brisbane and Tewantin. This stop sign was requested by my neighbor, Mrs. McLean, to try to slow down the traffic which uses Brisbane for a racetrack since it was opened into that industrial development.

2. Ask the city to set a speed limit of 20 miles per hour on Brisbane.

3. Ask the Auto Convoy truck drivers to observe the 20 mph speed limit.

As you can see, the Santa Fe and the Auto Convoy Company have no plans to take steps to inconvenience themselves in any way to attempt to restore some of the peace and tranquility that was enjoyed by the residents of Allen Farms before they invaded our area. They plan to continue to grind us under their heels as they have in the past.

One of my neighbors tells me that my Henry Thomas of the EPA, from an out-of-town office, addressed himself to this very problem with the railroads in Houston when he spoke on one of the midday news programs on television a couple of weeks ago. She said that he was in town for some sort of a seminar that was being held at the Shamrock. If you can supply me with his address, perhaps he has some ideas that can help me in this situation.

If you can give me any help in this matter or can direct me to any agency that can, I shall appreciate hearing from you. I cannot believe that somewhere in these United States there is not someone that will be sensitive to the problem of big business destroying the lives of individuals.

Sincerely,

Wanda Kirby
(Mrs. Bill Kirby)

cc: Larry Cena
Lynn Ashby, Houston Post

1 JUNE 1979

Rail Carrier Docket #ONAC 79-91,
Office of Noise Abatement and Control (ANR-490),
US Environmental Protection Agency,
Washington, DC 20460

Gentlemen:

If there needs to be a change in the amount of noise allowed from railroad yards, it should be to allow LESS noise.

There is no excuse for having a train go Tooooot-Tooot-Toot-Tooot for 15 minutes solid as it backs and forthes across an intersection, particularly when the intersection is over a mile away and the sound is loud enough to drive me up the wall.

The national passenger train agency has even louder horns, which is why I consider the proper pronounciation to be Damntrack.

I grant you the roar of backing trains and coupling cars is offset by passing jets, private planes roaring over residential areas while they practice take-off and landing, and the HOOOOOOOOOOT of the Ferry (I think the Spokane has a crush on one of the Damtrack trains), but because something is bad is no excuse to make it worse. The petroleum shortfall should start reducing the aircraft in the forseeable future, but trains are going to keep on running.

And if the trains are going to keep on running, it would be appreciated if at least some of their technological breakthrus are in the field of quieter operations.

79-01-066

Sincerely,

Lynn Kohner

Lynn Kohner
PO Box 9333
Seattle, WA 98109

234-4517

Oklahoma City, Okla.
May 16, 1979.

Rail Carrier Docket ONAC 79-01
Office of Noise Abatement and Control (ANR-490)
U.S. Environmental Protection Agency
Washington D.C. 20460.

Dear Sir:

It was the intent of congress for the U.S. Environmental Protection Agency to establish standards on all types of noise pollution that is injurious to the health and well being of the public.

Train whistles at railroad crossings that are protected by drop-gates and signal lights, cannot be justified, as adequate warning has been given to automobiles approaching such crossings.

Persons who live near railroad crossings that are protected by adequat drop-gates and signal lights, suffer needlessly from insomnia nervousness, and any physical condition they presently have is aggravated by needless noise pollution from train whistles. Most people that are affected are low to moderate income people and cannot move away from this type of noise pollution that is injurious to their health.

It is recommended that the office of Noise Abatement and Control with the U.S. Environmental Protection Agency be suspended and closed for their failure to set standards for train whistles at railroad crossings protected by drop-gates and signal lights, as they stated in the Federal Register / Vol.44, No 75 / Tuesday April 17, 1979 / Proposed Rules page No 22963

"We do not intend therefore to set standards affecting these devices through this regulation".

Sincerely
Beril F. Leeth
Beril F. Leeth
136 S.E. 26th
Oklahoma City, Okla. 73129

● Horns, Bells and Whistles: Horns, bells and whistles and other warning devices produce a form of noise intended to be heard for safety reasons, instead of being an unwanted by-product of some activity. We do not intend therefore to set standards affecting these devices through this regulation.

-BSRD ANR-490
25 MAY 79 11:04
851

1241 Warren Ave.
Seattle Wa. 98109
June 1, 1979

Rail Carrier Docket No. C NAC 79-01
Office of Noise Abatement + Control (ANR-490)
U.S. Environmental Protection Agency
Wash., D.C. 20460

I urge you not to relax noise control regulations to permit more noise from the Burlington Northern railroad yards in Interbay area, Seattle. There is already too much noise from the railroads around here, plus airplanes, trucks and autos. Why do you want us to have more? What purpose does your agency serve if not to control noise? If you don't do your job, your agency should be eliminated.

Mr. R. Landau

RECEIVED ANR-490
7 JUN 79 14:37

852

May 19, 1979

Mrs. Sue Lyste
1905 Eldridge Ave.
Bellingham, Wa. 98225

Rail Carrier Docket Number ONAC 7901
Office of Noise Abatement and Control (ANR-490)
U.S. Environmental Protection Agency,
Washington, D.C. 20460

Dear Sir:

We would like to point out:

1. We live 50-100 feet from a switch yard, (4 tracks)on top of an embankment so measurements can't be met. Testing by the State indicates that current levels average below E.P.A. regulations. Our situation is intolerable now, if these levels are allowed to increase, then what? We can't sleep now; are constantly harassed by sounds like explosions; can't speak normally to neighbors outside or over on the phone inside. It is definitely affecting our health and welfare now.

2. Engines and refrigerator cars are parked as close as 50 feet from our house now, running and revving, fumes entering our home. The regulation will not protect us from this sleep interference.

3. We have had many derailments, and slides are caused by the terrible impacts. We have very little land left because of this. These are large, beautiful, and valuable historic homes that were here before the railroad constructed their tracks on landfill below us. WHY is there no non-degredation clause? The regulation is totally unacceptable without it. Without one it will be a license for the railroad to degrade the already intolerable situation.

4. Why is there no PENALTY for excessive number of impacts? Especially at night? The regulations should allow local government to propose a curfew at night, for six hours at least, from the switching. The terrible impacts that we endure do not show up in the measurements like Leq and Ldn, and they disrupt our sleep to put it mildly.

5. We have kept detailed diaries for two or more years (during waking hours). They indicate the impossibility to get more that 3 or 4 hours of sleep at any given time. I am enclosing just one 24 hour period and a few other exerpts. This may explain a little.

We are totally opposed to this regulation. It is not nearly stringent enough.

Yours truly,
Sue Lyste

Hours of Train Observations Near Depot
April 13-1978 (for my personal records)

12:05-AM- [illegible] [illegible] explosion south of here ([illegible]) [illegible] engine entering the [illegible]

2:45-AM- Switch engine [illegible] [illegible] [illegible] tank cars, then [illegible] to 3rd track (3)

3:21-AM- Heard [illegible] noises, went to window at back. Same as last night, long freight north-bound carrying ten [illegible] tank cars [illegible] (10)

8:58-9 AM- Woke to loud crashing noise freight is being switched on 3rd track. Sounded like cars were striking. Tank cars from last night still sitting but being switched around now - 9:30 AM.

1:34-PM- Freight entered carrying (one) [illegible] - (1)

1:37 PM- Just jumped in my chair as the above entered tank car was slammed into another tank car on 2nd track.

2:00-PM- Freight entered - stopped to switch - as far I can see one tank car, then engine pull four tank cars off 3rd track, [illegible] [illegible] [illegible] (2:3[illegible] PM) - (7)

2:12-PM- Milwaukee Rd. north - carrying (5) tank cars while B.N. runs south on inside track. (5)

5:50-PM- Loud crashing [illegible] tank cars for some time now, then engine entered with (3) tank cars (3)

* Note - While working in yard saw the end of a freight (5:15 ?) was moving but I saw (2) tank cars (2)

6:40 PM- Freight entered with (3) [illegible] tank cars - stopped again to switch. (3)

[illegible]:30-PM Milwaukee entered (1) [illegible] tank car [illegible] out 12 other tank cars (don't know what they carry) (12) cont. 2.

11:45 PM - Freight on 2nd track suddenly started moving south. (engine running, 12-15 minutes ago) 13 tank cars have been parked on that track 2 weeks, but switching around every day [illegible]

April 13 - 11:45 PM - A crash just shook the house, loud enough to wake the dead. This is just terrible! - and switching continues!

April 24 - 8:55 PM - (Switching with six (P.G.) tank cars) Switching back to middle track & there was a loud, hard impact (crash) that shook the house really bad.

May 15 - 12:35 AM - Loud terrifying crash! made me run to window, my heart was pounding. Engine was then already 1/2 mile from tank car it had flying switched (with freight) into seven other tank cars on 2nd track, hard enough to move them all a long way down tracks. These are hard crashes!

June 2 - At 8:35 PM - Locomotive was idling directly below us. At 10:30 PM I called Glen Halloran (Air Pollution Authority). Wasn't home, I left a message. Very hot night, had to have one window open, fumes entering bedroom. Tried all B.N. RR offices for something. Finally got someone. They knew nothing about it, said it must be Milwaukee RR. Told me to close windows. I said we would have to leave the house, it was too hot. I said I had called Glen Halloran. I had been told they could not identify a locomotive, but upon mentioning Mr. Halloran (cont.)

They said they would 3 more it [illegible] to [illegible].
Later I heard loud screams. At app. 11:15 PM
it was turned off.

I have about 2½ yrs of [illegible]. Then later,
they put (hog-tied) [illegible] and
they jump on them. [illegible]
cars, loud music, [illegible]
as long as #3 [illegible] only [illegible].
[illegible] of [illegible]
blowing [illegible]
count. Have left [illegible]
[illegible] (it [illegible]
away) all night. [illegible].
Much more could be said.

0.24

ROBERT D. MARCOTTE
3568 Dodge Street
Omaha, Nebraska 68131
402-342-4175

Insurance Consultants, Inc.
R. D. Marcotte & Associates, Ltd.
Marcotte Insurance Agency, Inc.

April 19, 1979

Rail Carrier Docket ONAC 79-01
Office of Noise Abatement and Control (AWR-490)
U.S. Environmental Protection Agency
Washington, D.C. 20460

Gentlemen:

To begin with, let me tell you I have nothing whatsoever to do with the railroads, or the unions, or anyone who works for the railroad. I am interested in railroads and have been since I was a boy, and visit the yards and shops occasionally out of curiosity. I have also visited the large Union Pacific "hump" yards at North Platte, NE.

Quite frankly, I am appalled at this attempt by the bureaucrats to extend their tentacles into every facet of our daily lives. The only reason I can see that the EPA wants to pass this regulation is so that they can hire more people for more jobs, and raise everyone in the department to a higher pay level. The Federal government is not needed in the railroad "hump" yards of this nation. As a tax payer and interested citizen I protest this extension of the Federal government's authority into a matter which should be properly controlled by the state.

When are you social planners and bureaucrats going to quit interfering in the private lives of citizens?

Sincerely,

Robert D. Marcotte

Robert D. Marcotte

ms

857

Rail Carrier Docket
ONAC 79-01
Office of Noise Abatement and Control
ANR-490
U.S. EPA
Washington D.C. 20460

May 30, 1979

To Whom it may concern:

The proposed regulations of 70 decibels for noise levels from rail cars can't come too soon.

I live in the Highland area of St. Paul, Minnesota in a classified R-1 residential area. For two decades the people in this area have known the roar from diesel engines idling for hours in the residential area while they wait for the Ford Motor Company to load rail cars with automobiles and trucks ready for shipment. The switching from one track to another, the humping of cars create noise and vibrations which shake the homes so violently that one's bed actually moves across the floor.

I have attended meetings which have been for the purpose of trying to arrive at some sort of relief from the Noise for the neighborhood people. The Ford Motor Company listens to frustrated people, but they offer no sound solution to the problem. As a matter of fact, I do not think they intend to do one thing except make their appearance at these meetings. Also, the toxic diesel fumes

2)

envelop the entire area. I suffer severe asthmatic attacks from this air pollution. Asthma, bronchial disease and severe allergic conditions result from this toxic health hazzard.

I have written to Senator R. Boschwitz and Senator D. Durenberger concerning this matter, I have also been in contact with the Mayor of St. Paul, Mn., and the Southwest Council about the problems created by the Ford Motor Company in this fine, high taxed residential community

I sincerely hope that there will be strict regulations in this area of noise pollution and designed plans for the monitoring of these regulations. Without these tools, such large corporations as the Ford Motor Company will never comply.

Why doesn't the EPA set rules and regulations that electric engines must be used to hookup cars in residential areas to lessen pollution from the diesel engines now used? The Ford Motor company at St. Paul have their own generating electrical power. They could convert to this system very easily.

above all monitor the regulations.

Sincerely,
Helen Mair
2044 Itasca Ave,
St Paul, Minn.
55116

Carrier Docket # CNAC 79-01
Office of noise Abatement and Control
(ANR-490) U.S. Environmental Protection Agency
Washington D.C. 20460

As a resident on the west side of Queen Anne Hill in Seattle, Washington we protest the proposed new regulation for noise from railroad yards allowing more noise!

We need legislation to give us less than the existing noise.

79-01-083

Sincerely,
Mrs. Marjorie Meyers
Raymond W Meyers
1121 9th AVE, WEST
SEATTLE WASHINGTON
98119

ARD ANR-490
12 JUN 79 11:11

ENVIRONMENTAL PROTECTION AGENCY,
FICE OF NOISE ABATEMENT & CONTROL,
DEAR SIR,

I STRONGLY PROTEST ANY NEW REGULATIONS THAT WOULD ALLOW MORE NOISE TO COME FROM A RAILROAD YARD. WE LIVE ABOUT A THIRD OF A MILE FROM ONE HERE IN SEATTLE. THE AREA IS CALLED INTERBAY – SITUATED BETWEEN QUEEN ANNE HILL AND MAGNOLIA BLUFF, TWO VERY NICE RESIDENTIAL AREAS.

THE AMOUNT OF NOISE COMING FROM THAT MARSHALLING YARD IS PLENTY, ANY MORE WOULD MAKE THIS ANYTHING BUT A NICE PLACE TO LIVE IN.

SINCERELY YOURS,

Osborn M[illegible]

2301 - W. LYNN APT. 301
SEATTLE, WN. 98199

79-01-080

~ENHD ANR-490

7 JN 79 14: 42

79-01-110

RAIL CARRIER DOCKET (ONAC 79-01)
OFF. OF NOISE ABATEMENT + CONTROL (AW-490),
E.P.A., WASH. D.C. 20460,

I STRONGLEY PROTEST ANY EASING OF NOISE CONTROLS, PARTICULARLY IN RAIL-ROAD MARSHALLING YARDS.

IN THE AREA OF SEATTLE THAT MY WIFE AND I RESIDE IN THERE IS SUCH A YARD. IT IS CALLED THE INTERBAY YARD, AND IS LOCATED BETWEEN MAGNOLIA BLUFF AND QUEEN ANNE HILL. THESE ARE TWO VERY NICE RESIDENTAL AREAS, AND FOR THE PEOPLE IN THESE AREAS TO BE SUBJECTED TO AN EVEN GREATER NOISE LEVEL THAN THE LEVEL TO WHICH THEY ARE NOW SUBJECTED IS MOST INTOLERABLE.

MAKE NO CHANGES IN THE REGULATIONS.

SINCERELY YOURS,

[illegible]

2301- W. LYNN- APT. 304
SEATTLE, WN. 98199

RECEIVED AER-490
21 JUN 79 15:54

Timbergrove Manor Civic Club

P. O. Box 7149
Houston, Texas 77008

1015 Shirkmere Road
Houston, Texas 77008
May 22, 1979

Rail Carrier Docket No. ONAC 79-01
Office of Noise Abatement and Control (ANR-490)
U. S. Environmental Protection Agency
Washington, D. C. 20460

79-01-030

Gentlemen:

The Board of Directors of the Timbergrove Manor Civic Club (representing 1,000 homeowners in northwest Houston), have instructed me to compile and forward to you our comments on the Proposed Interstate Rail Carrier Regulations, that were published April 17, 1979, in the Federal Register.

Since many of our homeowners are, and have been for some time, subjected to very high noise levels from the nearby Eureka RR Yard, this civic club has taken an interest in the EPA's efforts to promulgate noise standards for railroad yards. We wish at this time to reinforce and commend the EPA's position, that the public's health and welfare related to noise should be a factor in setting these standards. The Association of American Railroad's argument that the public interest should be totally absent from consideration, is typical of their blatant disregard for efforts to improve the environment.

We appreciate this opportunity to review these proposed regulations and to offer our attached comments.

Sincerely,

Jerome Moore

Jerome Moore, Chairman
Noise Abatement Committee

JM/jc
attachment as noted
cc: JM file

29 MAY 79 10: 53
BARL ANR-490

TIMBERGROVE MANOR CIVIC CLUB MAY 19, 1979

COMMENTS ON PROPOSED CHANGES TO

40CFR, Chapter 1, Part 201

NOISE EMISSION STANDARDS FOR TRANSPORTAION EQUIPMENT; INTERSTATE RAIL CARRIERS

Subpart A--General Provisions

Section 201.1, Definitions.

paragraph (v) "Day Sound Level"

We wish to point out that many children and elderly persons are retired for the night by 9:00p.m. Therefore, we believe that the "Day Sound Level" should be reduced from the 15-hour time period from 7 a.m. to 10 p.m. (0700 to 2200 hours), to the 14-hour time period from 7 a.m. to 9 p.m. (0700 to 2100 hours).

paragraph (gg) "Night Sound Level"

For the same reason listed above, we believe that the "Night Sound Level" should be extended to the 10-hour period from 9 p.m. to 7 a.m.

paragraph (jj) "Railroad Facility Boundary"

We believe that this paragraph should be expanded to include that portion of the tracks (mainline or spur) that leave the facility in any direction, for a distance of one-half mile past where the yard tracks spur off. Exemptions could be granted after on-the-site inspection by EPA officials for special situations. We believe that the inclusion of a portion of these peripheral tracks is essential to effect a reduction of noise levels emitted by those facilities. As a matter of course, many railroad engineers consistantly use those peripheral tracks in their normal switching operations concerning longer trains.

Subpart B--Interstate Rail Carrier Operations Standards

Section 201.15, Standard For Car Coupling Operations

We strongly believe that the following sentence should be deleted from the paragraph. "The car coupling requirement can be alternatively met by demonstrating that the car coupling operations are not performed at speeds greater than 4 miles per hour at point of impact."

As your own field testing has shown, car coupling speeds are directly related to the noise levels emitted upon impact. If empty hopper cars (for example), cannot meet the A-weighted sound level limit of 95 dB at 30 meters at an impact speed of 4 miles per hour, then the speed of impact (3½ mph, 3 mph, etc.) necessary for noise level compliance should be determined by the railroads involved; and they should be held responsible for requiring adherence to the impact speed, determined necessary for that particular class of RR car, by their employees.

4.0 Rational for Standards Selection

Need for Health and Welfare Analysis:

We feel the public health and welfare related to noise should be of primary importance to the EPA in promulgating these standards to comply with The Noise Control Act of 1972, 42 U.S.C. 4901 et seq.

Overall Standard for Facilities and Equipment:

We wish to take issue with the EPA deletion of Horns, Bells and Whistles from these noise regulations. Conceding the fact that these devices are also used as warning devices intended to be heard for safety reasons, we wish to point out that these devices are frequently used excessively and frivolously by the RR engineers (indeed the way an engineer uses his horn or whistle is considered his 'trademark'). With the modern electronic technology available today, there should be no need for audible noise devices to be used for the historic type of communications between train engineers, brakemen, switchmen or conductors. All existing or proposed railroad grade crossing in urban areas should be required to be signalized with automated barricades that go down across the roadways when trains are approaching. Audible warning devices used on trains in urban areas should be limited in use to situations of clear and present danger, where loss of life or property damage is imminent.

We feel that the elimination of use in urban areas of these audible signal devices on the trains should be a goal of these regulations within a reasonable time frame, based on technology and available funds.

Day-Night Sound Level (L_{dn}):

We agree that the $L_{eq(24)}$ descriptor recommended by the AAR should not be used to characterize rail facility noise, because it does not account for the greater degree of intrusiveness by nighttime noise. the L_{dn} descriptor used by the EPA to correlate with known effects of the noise environment on an individual and the general public, is definitly preferable.

L_{dn} Standards:

We feel that an L_{dn} of 65 for hump yards is a reasonable standard that could be quickly acheived by the installation of sound barrier fences, limiting car coupling speeds to 4 mph, etc. However, we also feel that this same standard of L_{dn} of 65 should be set as a long term (10 year) goal for flat yards also. After all, the mere installation of a properly designed continious sound barrier fence on the RR R.O.W. lines, can effect a 7 to 12 dBA drop in the noise levels to adjoining properties.

Implementation Dates:

We would object to the proposed implementation dates (Jan 1982 and Jan 1985) as being too far into the future. We would suggest that July 17, 1980 and July 17, 1983 as implementation dates that would be more in the interest of the health and welfare of the citizens, without placing undo hardship on the railroad industry. After all, how long does it take to do a noise study, design and build noise barrier fences, and slow down the car coupling speeds to 4 mph?

TIMBERGROVE MANOR CIVIC CLUB MAY 19, 1979

COMMENTS ON PROPOSED CHANGES TO

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TIMBERGROVE MANOR CIVIC CLUB MAY 19, 1979

COMMENTS ON PROPOSED CHANGES TO

40CFR, Chapter 1, Part 201

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Attorneys
HITCHCOCK & PINKSTAFF
P.O. BOX 57
419 EAST 6th STREET
McMINNVILLE, OREGON 97128
(503) 472-9318
John W. Hitchcock ∴ *John C. Pinkstaff*

May 31, 1979

79-01-070

Rail Carrier Docket (ONAC 79-01)
Office of Noise Abatement and Control
(ANR-490)
U.S. Environmental Protection Agency
Washington, D.C. 20460

Re: EPA Proposed Revision to Rail Carrier
Noise Emission Regulations

Dear Sirs:

As a cooperating NEDC attorney, I have become concerned with noise problems caused by certain Southern Pacific diesel locomotive operations within the City of McMinnville during the last several years. I would request the above mentioned regulations in their final form include the following:

1. A non-degradation clause, providing that in areas with noise levels below the general standards on the date of adoption, that nothing in the regulations permits noise levels which exceed those lower ambient noise levels.

2. Standards relating to unnecessary engine idling in or near residential areas within city limits.

3. Standards relating to noise buffers needed to reduce noise levels in residential areas within the city.

4. Specific provisions for waiver of preemption by the Administrator with respect to state or local regulations which he "determines to be necessitated by" special local conditions and not in conflict with regulations published by EPA pursuant to the Noise Control Act of 1972, Section 17(C)(2).

5. Regulations specifying EPA's preemption interpretation. It is important for EPA to clarify the scope of preemption so as to be of guidance on complex legal and technical subjects in the absence of which state and local governments may be discouraged from taking action within their power, and further to set up a unified thesis for judicial interpretation in an area traditionally reserved for the courts, and finally, to assure an early,

RCVD ANR-490
5 JUN 79 15:56

central, authoritative and orderly resolution of legal issues without engaging in many lower courts over many years.

6. Lower noise level standards. Both the twenty-four hour and the one-hour proposed regulations are not protective of public health and welfare and are inconsistent with our national noise strategy. I agree with the position of the Regional Administrator of the U.S. EPA, Region X, that there is no justification for such high levels as contained in the proposed regulation, and the recommendation that more reasonable levels be established.

Thank you for your consideration.

Very truly yours,

HITCHCOCK & PINKSTAFF

John C. Pinkstaff

John C. Pinkstaff

JCP/jmb

xc: Ms. Marsha Halvarsson
638 E. 5th
McMinnville, OR 97128

Ms. Heidi Heidcamp
Northwest Environmental Defense Center
Lewis and Clark Law School
Portland, OR 97214

Mr. John Hector
Dept. of Environmental Quality
1234 SW Morrison St.
Portland, OR 97205

Ms. Deborah J. Yamamoto
Region X
1200 Sixth Ave.
Seattle, WA 98101

GEORGE RACE
587 GOODWYN COVE
MEMPHIS TENN 38111

21 APRIL 1978

DEPUTY ASSISTANT ADMINISTRATOR FOR NOISE ABATEMENT
EPA, 401 M STREET, SW, WASHINGTON, D. C. 20460

DEAR SIR: I AM SURE YOU RECEIVE MANY LONG-WINDED "NOISE/COMPLAINTS" SO I SHALL TRY TO MAKE THIS SHORT.

I LIVE AT THE CORNER OF GOODWYN COVE AND SOUTHERN AVE. IN MEMPHIS. THIS IS CENTRAL-CITY. SOUTHERN AVENUE IS LINED WITH ATTRACTIVE, INTEGRATED, MIDDLE-CLASS HOMES.

SOUTH--ACROSS SOUTHERN FROM MY HOME--ARE TRACKS OF THE SOUTHERN RAILWAY SYSTEM. ABOUT 100 YARDS WEST IS THE MARSHALLING AREA. ON TWO SETS OF TRACKS ACROSS FROM MY HOUSE, SOUTHERN DOES ITS SWITCHING AND "HUMPING" FO 24 HOURS A DAY. HUMPING CAN KNOCK ME OUT OF BED. THE QUADS OF DIESELS--BOOMING, BLOWING, WHISTLING, SNORTING--RATTLE DOORS, DISLODGE HANGINGS, CRACK FOUNDATIONS IN HOMES FAR DISTANT FROM THE TRACKS. CLOSE: MURDEROUS

ABOUT 300 YARDS ALONG SOUTHERN, DOUBLE TRACKS NARROW T A SINGLE LINE THAT CUTS ACROSS MAIN NORTH/SOUTH STS, CAUSING INCREDIBLE TRAFFIC TIE-UPS. FARTHER ALONG, THIS SINGLE LINE BISECTS THE OTHERWISE BEAUTIFUL CAMPUS OF MEMPHIS STATE UNIV. STUDENTS MUST SCRAMBLE ACROSS IT. ONE WAS KILLED. NOW CONTEMPLATED: TUNNEL COSTING ½ MILLION, UNDER THIS SINGLE TRACK!

THIS SITUATION IS AN ABOMINATION, DESTRUCTIVE OF ALL AROUND IT. IF EVER THERE WAS AN ENVIRONMENTAL BLIGHT, THIS IS IT. YET, IF THIS SINGLE LINE WERE CONVERTED TO A RAPID TRANSIT SYSTEM, RUNNING FROM THE SUBURBS, PAST THE UNIVERSITY, THROUGH MID-TOWN, TO DOWNTOWN AND THE RIVER, IT WOULD BE THE SALVATION OF MEMPHIS.

ECONOMIC FEASIBILITY MUST BE CONSIDERED. THE SOUTHERN SERVES MEMPHIS, WELL. BUT I BELIEVE THIS OBSOLETE YARD IN THE CENTER OF THE CITY, AND THESE FEW LINES THAT DISRUPT THE CITY, COULD BE COMBINED WITH EXISTING LINES AND A MODERN YARD, OUTSIDE THE CITY.

I HOPE YOU AND YOUR DEPARTMENT WILL INVESTIGATE THIS VERY VITAL PROBLEM.

SINCERELY,

G. Race

GEORGE RACE

+ Frisco

4-07-04

Commuters' Tempers Heat Up As Trains Choke Off Traffic

From Page 1

which his office used to receive the most complaints were Poplar and Perkins and Southern and Highland, both locations crossed by the Southern Railway.

"It's the age-old problem, but I think we are receiving fewer complaints because of cooperation from the railroads." Hutchinson said.

But that doesn't stop East Memphis motorists from complaining to each other about traffic tie-ups along Poplar and Southern.

Sandra Abel, who works in a store on Mendenhall just south of the railroad tracks, estimated that 10 or 15 trains a day, some with more than 100 cars, cross Mendenhall, which sometimes causes "traffic to stack up around the curve."

Elane Rogers, who used to have to deal with trains in reaching her Midtown job every morning from her home in the Quince and Perkins area, said she was caught by a train between 8 and 8:30 a.m. about 3 mornings a week.

"Normally, I would try to cross on Goodlett, but if the train was there, I'd try to outrun it to Highland," Mrs. Rogers said. "If I couldn't get across there, I'd go down to one of the underpassses further west. They were sometimes so stacked up, though, with people with the same idea that I would have to go all the way to Air-'ys to get across the tracks.

\nother way trains cause problems, ,en when they are not stopped across an intersection is when they stop just past an intersection. On a recent Friday a Southern Railway train that had only taken two minutes and 37 seconds to cross Mendenhall stopped just west of the Ridgeway and Park intersection. It was not actually blocking the crossing, but it had stopped close enough to activate the flashing red lights. The more cautious motorists stopped and blocked traffic and others sped through the intersection, together creating confusion.

ICG railroad official Robbins explained that some trains must stop and inadvertently block traffic, because of emergency situations which require the train's crew to walk the entire length of the train checking for problems.

According to Nathan Ficklin, the Tennessee Department of Transportation has initiated a feasibility study for a overpass of the crossing at Southern and Highland.

"I'm not aware of any plans for other crossings," he said. "All raisings or lowerings of the tracks are extremely expensive, running into millions of dollars."

"If you are in a hurry three minutes is a long time," he said. "Any delay is objectionable. But we live in the real world, we have to recognize the fact that they (the trains) have to go through."

He added that trains were running along the tracks a long time before the commuter filled roads were built.

"They were here first," he said.

Ficklin added that all the safety precautions possible have been taken, which allow traffic on streets not blocked by the trains to continue. Poplar at Mendenhall has a flashing traffic light when trains are passing, to allow traffic through if it is safe, he said.

"At other locations we have done everything that is feasible." he said Ficklin added that he has no knowledge of long range plans for railroad over or underpasses.

The study on the Southern and Highland crossing just started, he said. The start of construction "won't be soon," Ficklin added.

The consultant has to approve the feasiblity of work and determine what method to use in building the over or underpass. The consultant was charged to come up with as many as nine methods, Ficklin said.

097

cimitar EAST Shopping Guide

BRUARY 16, 1978

Edited by CANDY JUSTICE

as Trains Halt Rush-Hour Traffic

By CANDY JUSTICE
Press-Scimitar East Editor

Blocked railroad crossings apparently are among the most frustrating problems for East Memphis drivers despite what police describe as "cooperation" from the railroads.

"It's most definitely an irritation," said Tom Sampson, who works in Midtown and drives down Broad Street on his way home to Bartlett. "I get stopped by a train at least two times a week going home. I don't believe I've ever waited less than 5 minutes and I have waited as long as 20 minutes. I know that for a fact, because I timed it."

Sampson said his wife, Kay, who works downtown, refuses to drive the Broad Street route, because of the train problem, which is aggravated by the fact that there are two sets of tracks, one-tenth of a mile apart, between Scott and Collins. The eastern set of tracks is used by four railroads — Louisville & Nashville, Illinois Central Gulf, Cottonbelt and Missouri Pacific, which only uses them part of the year.

Between 4:30 and 5:30 p.m. on a recent Friday a stopwatch was used to time three trains that crossed Broad on the eastern tracks. About 4:45 p.m. a train of about 60 cars passed the crossing in two minutes and 55 seconds and 75 autos were stopped by the train. Eighteen minutes later, another train with about 35 cars blocked 67 autos for two minutes and 16 seconds. An 84-car train came through 15 minutes later and blocked about 80 vehicles for five minutes and four seconds.

The following Monday, four trains passed Broad within just 30 minutes from 5 to 5:30 p.m. and the traffic consequences were much greater than they had been the Friday before.

About 5, the lights began flashing at the western track crossing, and at least a dozen cars sped across the tracks, which have no cross-bars to stop autos. The train was only seven cars long and delayed only 19 autos for one minute and 18 seconds.

Two minutes later, however, a train of about 85 cars came along on the eastern tracks and took five minutes and 35 seconds to clear the intersection. Two lanes of traffic going east were backed up more than three blocks and about 150 vehicles going both directions were brought to a halt. Before the train reached the crossing, several motorists drove between the crossing barriers to beat the train to the intersection. Even after the barriers were lifted, because of the traffic signals at Bingham and Scott, it took more than 8 minutes for the traffic to begin to roll fairly smoothly again.

About 20 minutes later, on the west track a 16-car train stopped 30 autos for about a minute. Within three minutes, another train had come along on the eastern tracks causing a two-minute, 29-second tie-up of about 50 autos.

Jenny Platkus, an employe of a business which is located just west of the railroad tracks, said the back-up is "unbelievable at rush hour" morning and evening every day.

"You can sit there for 15 or 20 minutes waiting for the trains to pass," she said. We've watched the traffic hardly budge for half an hour after a long train has passed. The east track is the really bad one."

Charles Robbins, an Illinois Central Gulf office manager, said the railroad would prefer to never block a crossing, but sometimes it cannot be avoided.

"It's hard to get over to the public that we can't avoid those delays. I know how it feels. I've been blocked by my own railroad before," Robbins said. "A lot of people think we can avoid blocking an intersection at rush hour, but what they don't understand is that if we released Broad, for example, we might have to block Hollywood."

Some people complain that the railroads could at least make the trains shorter at rush hour, but Robbins said the railroads have to consider the economics of such a move. It takes almost as many people to staff a short train as a long one, and Robbins said the railroads would often lose money if they had to pay a whole crew just for a few cars.

According to the city attorney's office, railroads can lawfully block traffic for only five minutes unless the train is moving or switching. If a train took 20 minutes to cross an intersection it would not be violating the law as long as it was m[oving] or switching cars.

George Hutchinson, traffic comma[nder] for the Memphis Police Department, said his office has seen a decrease in complaints from citizens about blocked crossings during the past few months.

"We do periodically get complaints about trains blocking traffic, and we always notify the railroad and check the complaint out ourselves," Hutchinson said. Every few months, Hutchinson said, he and other city officials meet with railroad officials to discuss the complaints and what can be done about them. He said some tickets have been issued to engineers over the years, but he doesn't remember such a case in the past year. Hutchinson said the two East Memphis locations about

Turn to Page 3 —
COMMUTERS' TEMPERS

1618-9th Avenue West
Seattle, Washington 98119
June 2, 1979

Rail Carrier Docket No. ONAC 79-01
Office of Noise Abatement and Control
(ANR-490)
U.S. Environmental Protection Agency
Washington, D.C. 20460

79-01-074

Dear Sirs:

Recently I learned that you are considering a new regulation for noise from railroad yards, which would allow more noise than before. I want to go on record as being opposed to this new regulation. It is difficult enough now to get to sleep in Seattle with the present noise levels from the railroad yards. Any new regulation ought to diminish, rather than augment, permissible noise levels. Another factor against this new regulation is its difficulty for being monitored. More delicate and expensive equipment will be needed, and because of this very expense, it will probably not be purchased. Please reconsider this new regulation.

Thank you.

RCVD ANR-490
6 JUN 79 14:34

Yours truly,
Virginia Ramm
Virginia Ramm

Kathleen M. Rasmussen
1814 Magnolia Way West
Seattle, Washington 98199
206-283-4698

May 31, 1979

Rail Carrier Docket No. ONAC 79-01
Office of Noise Abatement and Control ANR-490
U.S. Environmental Protection Agency
Washington, D.C. 20460

To Whom It May Concern:

Regarding the proposed new regulation for noise from railroad yards:

I am appalled that the present noise levels are allowed in a highly populated and very desirable city living area, let alone that increased decibel pollution may occur here.

Returning to Seattle last year, we purchased a home on the Southeast slope of Magnolia, and were soon kept awake by the switching and banging of railroad cars. This noise, coupled with the occasional reversal of flight patterns, is enough to unnerve any city resident. It is disturbing enough for us knowing that railcars with explosive chemicals are often parked and passing through the Interbay area. It is unthinkable that city workers, such as ourselves, should be subjected to these hazards after hectic, productive workdays in the downtown area.

With the prices of these city homes, and our ever increasing taxes, we have a right to safety and quiet in our neighborhoods.

Sincerely,

Kathleen Rasmussen

Mrs. John R. Rasmussen

cc: Mr. Steve Nakashima
Seattle/King County Health Department
Noise Control Program

79-01-068

RECEIVED ANR-490

5 JUN 79 15:53

JOHN T. REBANE
ATTORNEY AT LAW
614 McKINLEY PLACE
MINNEAPOLIS, MINNESOTA 55413
TELEPHONE 612-331-6330

June 19, 1979

Rail Carrier Docket ONAC 79-01
Office of Noise Abatement and Control
ANR-490
U. S. Environmental Protection Agency
Washington, D.C. 20460

RE: Federal Register Document 79-11707

Dear Sir:

In my own behalf and on behalf of other persons, all residing in proximity to a railroad switchyard located within the city limits of Minneapolis, Minnesota, I urge you to strengthen the requirements relating to noise emanating from railroad switchyards.

Since the federal regulations are to be preemptive, I note that the otherwise more effective noise limitations imposed by the State of Minnesota and the City of Minneapolis will become useless. Even with the existing regulations, control of the subject switchyard is difficult.

I further urge you to consider shock values as far as noise regulation. Although difficult to measure, it is equally as difficult to determine average readings during the course of any period. Especially annoying are intermittent thrashes of switchyard equipment and of the coupling devices when cars are switched during the hours of darkness.

Even under the regulations as proposed, the permissible noise levels emanating from railroad switchyards in many areas will increase. Any attempt by the Association of American Railroads, CONRAIL, or others to further defeat existing or proposed restrictions should be, in my opinion, vigorously opposed.

Respectfully,

John T. Rebane

kt

79-01-117

BOARD ANR-490
27 JUN 79 10:45

1009 W. Blaine
Seattle, Washington
98119
June 10, 1979

Dear Environmental Protection Agency:

It was with considerable incredulity that I read in the neighborhood paper (Queen Anne News) that consideration was being given to allowing even more noise than we have at present in the railroad yards near here. As it is the squeeling and occasional thunking of the trains is enough to disturb sleep and interrupt study, both of which I have need to do at my home on top of the hill, a good half mile away from the yard. I beg you not to let the noise become even louder and more intrusive than it already is.

Sincerely,

Jerome Richard

REF: Rail Carrier Docket No. CNAC 79-01

79-01-096

RECEIVED ANR-490 18 JUN 79 14:18

878

RECEIVED ANR-490 18 JUN 79 14:18

122 Shadow Court
Dover, DE 19901
May 24, 1979

Rail Carrier Docket ONAC 79-01
Office of Noise Abatement and Control (ANR-490)
U. S. Environmental Protection Agency
Washington, D.C. 20460

Dear Sirs:

As one of more than 800 families living near the Conrail marshalling and switching yard adjoining New Burton Road in the City of Dover, Delaware, I wish to take strong exception to the Proposed Noise Emission Standards for Transportation Equipment; Interstate Rail Carriers published in the Federal Register, April 17, 1979. My objections and comments are summarized as follows:

79-01-044

HEALTH AND WELFARE

The proposed regulations are not protective of public health and welfare and are inconsistent with your own findings, your own national noise strategy, and the intent of the Noise Control Control Act of 1972. In your 1974 studies you have identified an outdoor Ldn value of 55 dB as the level of noise which is "still protective of health and welfare with an adequate margin of safety." And you have established the fact (which we can verify from experience here in Dover) that about four million people in this country are already exposed to day-night average levels of 75 dB, or greater from rail facility noise sources. And you know that this high noise level annoys, disturbs, injures or endangers the comfort, response, health, peace or safety of persons living in proximity to railroad noise sources. And you realize that such impacts do not become negligible until outdoor values of 55 Ldn are reached. Nevertheless, none of your proposed standards is below an Ldn value of 65 dB, and many of your standards are even much higher than average current rail facility levels. For example, your standard for car coupling operations is "an A-weight sound level of 95 dB at 30 meters" (201.15), and your standard for mechanical refrigerator cars under stationary condition is "an A-weighted sound level of 78 dB at 7 meters" (201.14).

Instead of offering relief and promoting "an environment for all Americans free from noise that jeopardizes their health or welfare" (Noise Control Act of 1972), these proposed regulations stop far short of the degree of protection clearly needed and mandated by the Congress.

Your final version of these regulations should adopt the Ldn 55 dBA criterion for all railyard noise sources and a maximum hourly Leq of 60 dBA (day) and 50 dBA (night).

PREEMPTION AND STATE AND LOCAL ENFORCEMENT

Because these proposed standards are also totally preemptive, you will be prohibiting State and local governments from enforcing their own more stringent standards which are now or could be protective of public health and welfare. State/local freedom to independently solve railroad noise problems will be essentially eliminated and control of railroad noise sources at the local level will be allowed only to the degree and levels allowed under your own final regulations. Isn't this an added reason for you to re-examine the high noise levels you have allowed in these regulations and reducing them at least to outdoor values of 55 Ldn?

Moreover, your measurement criteria are extremely complex and will result in little, if any, enforcement by State and local noise control agencies. Adoption of identical regulations at the State/local level will be a lengthy, if not impossible, task. No State or local noise control agency will be able to enforce them. They are too complex and require sophisticated techniques and equipment which State and local programs can little afford. A more simple statistical measurement procedure with less sophisticated equipment should be developed instead.

And the final regulations should also include procedures to operationalize the "waiver of preemption" provision which the Noise Control Act permits if a local rule is necessitated by "special local conditions" and is "not in conflict" with Federal regulations. Although your agency has given some attention to this provision, you are apparently reconsidering your current guidelines and you have apparently not settled on a procedure and a method for judging any such waivers. Otherwise, you would have responded by now to the waiver petition which the City of Dover filed with your agency on October 31, 1977. Shouldn't these regulations, therefore, also establish once and for all your procedures for initiating action on the waiver provision?

FLAT YARDS AND SUBCATEGORIZATION

These proposed regulations do not recognize the fact that railyards vary in size, shape, and special characteristics, and that the noises produced there are diverse. Moreover, they do not recognize that the communities which neighbor these yards are equally diverse, varying in distance from the yards and land zoning, population density, and distribution. I, therefore, believe an appropriate subcategorization of flat yards should be made so that at least some of these yards could be required to attain an Ldn of 55 or lower. This possibility is referenced on page 22,964 of the April 17th Federal Register, and I believe it could reasonably be made to offer some additional relief to a larger number of persons currently affected by noise intrusion from these yards. Possible criteria for such a subcategorization could include distance variations between receiving "developed" property and rail yard facilities and the number of people in proximity to the yard. In other words, lower Ldn levels should be required in yards that are closer to residential property and/or larger numbers of people. The Conrail yard here in Dover, for example, is only 100 feet from several residential developments that include about 800 families. Allowable noise levels from a yard this close to a large number of people should certainly not be as high as a similar yard which exists within a large industrial park complex, or is located near only one or two houses.

AVAILABLE TECHNOLOGY FOR NOISE ABATEMENT

The techniques for noise abatement prescribed in these proposed regulations seem to preclude the use of other controls, such as refrigerator and idling locomotive relocation, or shut down requirements, or the possibility of rescheduling of night-time activities. In my judgment, these are also workable and reasonable techniques and should be recognized and published for use by the railroads and enforcing agencies as part of the final regulations. The allowable noise levels should be lowered based on the assumption that these kind of controls are both available and reasonable.

EFFECTIVE DATE/EXISTING PRACTICE

While I do not concede that something you have identified as "existing practice" is in fact the case, I do believe that there should be an immediate effective date for compliance with any standards which merely codify existing practice. For example, if in fact the car coupling standard will not result in additional costs to rail carriers, nor the application of new technology, then that specific standard requires no lead time and should be complied with on the date on which you publish the final rules on this matter.

HORNS AND WHISTLES

Your decision not to set standards affecting these devices through this regulation is based on the assumption that horns and whistles are "intended to be heard for safety reasons." While that may be the purpose for having these devices, it is not always the purpose for which they are utilized. Here in Dover, for example, the whistle is simply used to communicate with a worker on the ground or to simply "wake up the community." Two-way radio hook-ups are available and inexpensive, but the local Conrail operation does not use them here. Moreover, we have heard and watched some operators simply sit in the yard and operate the whistles on their locomotives repeatedly without any reason that we can determine, except to disturb us. That may seem unbelieveable to you, but it is a fact to us.

I would, therefore, recommend that you propose some standard to control these devices in situations where safety reasons are absent.

PUBLIC PARTICIPATION

Although there is a statement in your "Background" document that you "consulted with over 100 local officials to gain a better perspective of railroad noise problems as they directly affect the public," there is no documentation that you have in fact implemented Executive Order No. 12044, and afforded all interested parties an opportunity at a very early stage to participate in the development of these regulations. I know of no State or local official or citizen in Delaware whom you have contacted about these regulations prior to their issuance, in spite of the fact that you were obviously aware of the fact that the City of Dover was relegated "to the rulemaking process as a means of achieving its relief" by Judge Steel in the U.S. District Court for the District of Delaware on April 26, 1978, in its case with Conrail concerning the Dover switch yard. I would, therefore, urge you to seek still a further extension of the date for final promulgation of these regulations to allow for participation by interested parties.

CONCLUSION

It is apparent from these very limited proposed regulations and from what has occurred to date in the matter of your attempting to implement the railroad noise section of the

Noise Control Act of 1972, that your agency should take responsibility for preparing appropriate recomendations for amendments to the statute for consideration by the Congress. You will hopefully get that process started now, and especially address the question of the total preemption provisions of Section 17, as it has been interpreted by the U.S. Court of Appeals (D.C. Circuit) so that State/local governments might once again be free to set their own standards for railroad equipment and facilities.

Sincerely,

Eugene B. Ruane

Eugene B. Ruane

EBR/ed

cc: The Honorable William V. Roth, Jr.
The Honorable Joseph R. Biden, Jr.
The Honorable Thomas B. Evans
The Honorable Pierre S. du Pont
The Honorable Austin P. Olney
The Honorable Kermit Justice
The Honorable Edwin D. Steel, Jr.
The Honorable Charles L. Legates
The Honorable Robert D. Bewick, Jr.
The Honorable Joseph McDonough

May 30, 1979

Rail Carrier Docket
ONAC 79-01
Office of Noise Abatement and Control
ANR-490
U.S. EPA
Washington D.C. 20460

To Whom it may concern:

The proposed regulations of 70 decibels for noise levels from rail cars can't come too soon.

I live in the Highland area of St Paul, Minnesota in a classified R1 residential area, for two decades the people in this area have endured the roar from diesel engines idling for hours in the residential area while they wait for the Ford Motor Company to load rail cars with automobiles and trucks ready for shipment. The switching from one track to another, the bumping of cars create noise and vibrations which shake the homes so violently that one's bed actually moves across the floor.

I have attended meetings which have been for the purpose of trying to arrive at some sort of relief from this noise for the neighborhood people. The Ford Motor Company continues to frustrate people, but they offer no concrete solution to the problem. As a matter of fact, I do not think they intend to do one thing except make their appearance at these meetings. Also, the topic about former

2)

envelop the entire area. I suffer severe asthmatic attacks from this air pollution. Asthma, bronchial diseases and severe allergic conditions are all from this type health hazard.

I have written to Senator [illegible] and Senator D. Durenberger concerning this matter. I have also been in contact with the Mayor of St. Paul, Minn, and the Southeast Council about the problems created by the Ford Motor Company in this fine, highly rated residential community.

I sincerely hope that there will be strict regulations in this area of noise pollution and designed plans for the monitoring of these regulations. Without these tools, such large corporations as the Ford Motor Company will never comply.

Why doesn't the EPA set rules and regulations that electric engines must be used to protect cars in residential areas to lessen pollution from the diesel engines now used? The Ford Motor company at St. Paul has their own generating electrical plant. They could convert to this system very easily.

Above all monitor the regulations.

Sincerely,
Helen Mayer
3044 Thomas Ave,
St Paul, Minn
55116

Rail Carrier Docket No. ONAC 79-01
Office of Noise Abatement and Control (ANR-490)
U.S. Environmental Protection Agency
Washington, D.C. 20460

We oppose the Environmental Protection Agency's proposed new regulation for noise control from railroad yards.

It is our understanding the proposed regulation will permit more noise to emanate from railroad yards, and in addition apply the same criteria to residential areas as are applied to industrial areas. This is unacceptable.

We also oppose the proposed legislation requirements for technical equipment and methodology to measure noise. It is possible the expense involved would prohibit any measurement.

NAME	ADDRESS	CITY
[illegible]	2233 [illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	
Betty V. Linhardt	2209-12th Ave W	Seattle, 98119
[illegible]	[illegible]	Seattle 98119
[illegible]	22[illegible] - 12th [illegible]	[illegible]
		Seattle 98119
Katherine S. Lindy	2230 - 13th W	Seattle 98119
[illegible]	2227 - 12th W.	Seattle 98119
[illegible]	2516 13th W	
[illegible]		
[illegible]	2245 - 13th West	Seattle 98119
Marielle Farrell	2253 12. W.	Seattle 98119
Myrtle B. O'Connell	2230 12th W	Seattle [illegible]
Neil O'Donnell	2230 - 13th W	Seattle 98119
[illegible] Jones	2242 - 12th W	Seattle 98119

ONAC-SAHD 27 JAN 79 4:31

Rail Carrier Docket No. RCNC 79-01
Office of Noise Abatement and Control (ANR-490)
U.S. Environmental Protection Agency
Washington, D. C. 20460

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We also oppose the proposed legislation requirement for technical equipment and methodology to measure noise. It is possible that the expense involved would prohibit any measurement.

NAME	ADDRESS
Verna C. [illegible]	3245 - 12th Ave. West
Mary T. Bill [illegible]	3238 - 12th West [illegible]
Emmett E. Day	2232 12th West [illegible]
Margaret T. [illegible]	3252 26th Ave. West [illegible] 98199
[illegible] F. [illegible]	3252 26th Ave. West [illegible] 98199

[illegible] ANR-490
27 JUN 79 12 31

William A. Sternad, M.E., P.E.
Consulting Engineer
P.O. Box 8, Wayzata, Minnesota 55391

Controlled Systems (612) 473 4700

June 25, 1979

Rail Carrier Docket Number ONAC 79-01
Office of Noise Abatement and
Control (ANR-490)
U.S. Environmental Protection Agency
Washington, D.C. 20460

Reference: EPA 550/9-78-207

79-01-143

TECHNOLOGY FOR REDUCED RAILYARD NOISE

As the holder of U.S. Patent 3,756,159 RAILROAD CAR HANDLING AND CLASSIFICATION APPARATUS I wish to inform you of a new system which efficiently classifies cars with greatly REDUCED NOISE and ENVIRONMENTAL IMPACT (see enclosed map). This system eliminates all free movement of railroad cars and takes over the function of switching engines thus minimizing coupling, retarder and locomotive noise. It can be retrofitted to existing yards without disrupting operation or installed in new classification yards.

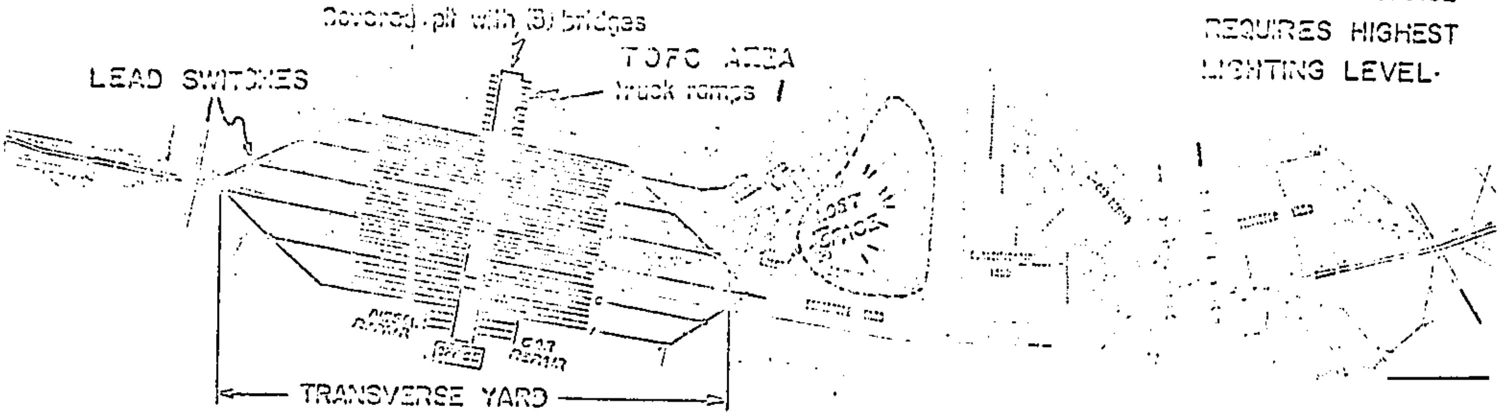
This technology was not previously considered by EPA in determining noise regulations. It offers major improvement and should be of use in deciding what noise levels can be feasibly attained.

Sincerely yours,
William A. Sternad
William A. Sternad

WAS:ws
Enclosures: yard map
Summary of Potential Merits
cc: Senator Rudy Boschwitz

onto a typical HUMP YARD a TRANSVERSE YARD is superimposed
Concentration of activity under a WELL LIGHTED ROOF
greatly improves working conditions, SAFETY, & operations.

NOTE:
LOST SPACE
REQUIRES HIGHEST
LIGHTING LEVEL.



	TRANSVERSE	vs.	HUMP YARD	
ENERGY CONSUMPTION	2000 H.P.		6000 H.P.	(exclusive of ENGINES)
POLLUTION	NONE		AIR, LIGHT, & NOISE	
LAND USE	1	/	3	
PRODUCTION		SAME		
COST	\$10 M		\$30 M	

RAILROAD CAR HANDLING AND CLASSIFICATION APPARATUS

Summary of Potential Merits

U. S. Patent 3,756,159

Every feature herein described advances urgent objectives of our economic priorities which can be classified:

1. ENERGY CONSERVATION - direct savings are possible in classification yard operation for two reasons:

a. Cars are moved minimally, under computer program, to achieve the required assembly process.

b. Since the equipment is electro-hydraulic, the dynamic energy of moving vehicles is recovered during the braking phase of every movement..

- indirect savings can be very significant. If our national railroad network were improved to provide better service, much highway traffic could be replaced. Steel wheel on steel rail is about five times as efficient as rubber tires on pavement.

2. POLLUTION ELIMINATION - the direct result of the substitution of electrical energy for liquid fuel is the complete absence of any air or water pollution in an existing facility. Obviously, some pollution will emanate at the electrical generation source, but, the absolute quantity will be only 5 to 10% of that currently experienced. Noise is not generated because there is no humping or free movement of cars with this controlled mechanism.

- it follows, if highway traffic is reduced, air, noise and water pollution will be proportionally decreased.

3. HUMAN FACTORS - work in a railroad yard under many weather conditions is difficult. Having all operation under cover of a roof offers tremendous improvement for the workers.

- Safety: all car movements are made from rest to rest--there is no need for people to jump on and off moving vehicles or to ride them--

there are no free-moving cars at any time. With activity limited to a much smaller space, a well lighted working area replaces the dim light of present yeards.

- Employment: Since this system is more efficient, less manpower is needed to handle a yard operation. However, it is predictable that total railroad employment would increase with improved service. Not only would the quality of work be upgraded, but the number of jobs would increase.

4. SOCIETAL BENEFITS - Productivity is vital in the economic world. As a nation, it is imperative that we continually strive to produce more at a lower cost of resources.

- Land Use enhancement of both railroad property value and that of surrounding neighborhoods certainly follows pollution elimination. Furthermore, the actual area needed to accomplish necessary switching might be reduced 50 to 70 percent, and thus release real estate to higher use. It is not unlikely that useable commercial space might be constructed over existing yards. A unique quality of this concept is that it could be retrofitted into most existing yards without disruption of service.

- Community Improvement: It is not unusual for many towns to have roadway crossings "tied-up" for uncomfortably long periods by railroad operations. This would be eliminated because all activity would be in the center of the yard instead of at the ends.

- Improved Transportation Service can only serve to make America more successful in a competitive world.

5. MANAGEMENT CONSIDERATIONS - Control and Communications are fundamental to the optimum operation of any human activity. Simply concentrating all activities into a reduced space improves the ability to manage an operation. Computer control of mechanical activities makes a viable system feasible. In any human endeavor, physical remoteness aggravates human interaction.

- Car Utilization is improved when time spent by cars standing in yards is reduced.

- Loss & Damage is absolutely eliminated when cars are always moved from rest to rest with each movement. Security of yard operation is improved by having activities confined.

- Inspection is greatly improved when it can be done in a "factory-like" environment. Further, the mechanism inherently determines the "rollability" of each car. This better inspection could significantly reduce over-the-road mishaps.

- Service and Repair such as clean-out, weighing and B'O' handling can be expeditiously implemented.

- Track & Switch Maintenance is greatly reduced because all activity is in the center of the yard. Lead switches need only be used to direct arriving and departing trains.

- Engine Maintenance is eliminated with the elimination of the need of classification switch engines.

- Miscellanous Savings many small details are obviated by this more efficient apparatus, like the need for a rover car and clerk to determine remote conditions, batteries for lanterns, walkie-talkies, etc.

IMPROVED SERVICE = INCREASED BUSINESS

is axiomatic. Tremendous improvement of intermodal transportation can be achieved by employment of this equipment. Dockside operation improvement as well as facilitation of TOFC and COFC activities is inherent to a transverse movement of rail cars. With the integration of the powerful data handling systems currently being employed, the railroad industry has the potential to serve the American economy with a new and increased vitality.

June 25, 1979

Office of Noise Abatement and Control (ANR-490)
U.S. Environmental Protection Agency
Washington, D.C. 20460

Re: Rail Carrier Docket No. CNAC 79-01

I recently learned that you have proposed a new regulation governing noise from railroad yards that will allow railroads to make as much noise in residential areas as in industrial areas.

I live on Queen Anne Hill above the railroad yards at Interbay in Seattle and I oppose the regulation. The noise level coming from the yards is already high: I have been awakened from a sound sleep on many nights by the current level of screeching and banging.

79-01-128

As do many people in the Queen Anne and Magnolia areas of Seattle, I have a substantial investment in my home. That investment takes into account the overall environment, including the noise level. My neighbors and I have a legitimate expectation of peace and quiet in the neighborhood.

A regulatory agency like the EPA, designed to protect the populace from noise pollution, should be attempting to reduce the noise levels around residential neighborhoods, not raise it to the level allowed in industrial areas where expectations of peace and quiet are reduced.

If I had a vote in the matter, I would resoundingly vote no. Please take my views, and those of my neighbors, into consideration.

Sincerely,

Evelyn Sroufe

Evelyn Sroufe
2553-12th West
Seattle, Wa. 98119

5/19/79

Rail Carrier docket No ONAC-7901
Office of Noise Abatement and Control
ANR-490
U.S Environmental Protection Agency
Wash. D.C 20460

Dear Sirs!

The noise and jarring of our property by the railroad below us at times is unbearable, we have a expensive home and a extra heavy construction, and it still at times shakes our home, with the heavy banging of the cars.

We are about 250 ft from the track, and the same distance from where a lot of the switching is done.

ONAC ANR-490

24 MAY 79 10:51

There was as I understand it a agreement with the city that they were not to switch after a certain hour at night.

But the last few nights around 1 and 2 A.M. we were woke up by those awful crashes of the [illegible].

We know that the trains must run but we believe the can be a lot more carefull in their switching.

We are nearing our 80 yrs of age and would like to get our sleep. If something can be done to stop this awful noise, we all along our street would be very greatful

Sincerely
A J Samel
1615 Eldridge Ave
Bellingham Wash
98225

2567 Eldridge Ave
Bellingham, Wa 98225
May 23, 1979

Rail Carrier Docket Number ONAC 7901
Office of Noise Abatement & Control (ANR. 490)
U.S. Environment Protection Agency,
Washington D.C. 20460

Dear Sirs:

State testing indicates current levels of decibals average below standard proposed in the new E.P.A. regulations. This effects our health, with lose of sleep, also impacts from switching shake our beds; they also leave parked running engines refrigeration cars below our home. 79-01-044

I think regulations should allow local government to make curfew during the night to resident free from switching

I have resided in the area four years + from the constant ground shaking I have noticed the soil shaking down.

Sincerely

Jane Tretwald

Office of Noise Abatement
& Control
U.S - EPA
Washington, D.C. 20460

Re: Docket Rail Carrier # ONAC-7901

Gentlemen:

We have lived at 2015 Eldridge Ave. Bellingham, Wa. for 16 years. Our home is located on a bluff approx. 50' back from the bluff, & the railroad tracks are directly below the bluff or embankment. The above docket # would greatly influence our health & welfare as humans!

Our sleep is constantly interrupted now with the constant night switching. Our house shakes & the stance effect both day & night is tremendous, similar to an earthquake. Every new guest comments, how we tolerate this noise & trembling effect.

79-01-043

043

SPRD ANAL 31 MAY 79

The excessive speed of the switching machine no wonder when a L.R.I car will be involved in a derail-ment & possible accident.

The engines & refrigerator cars they leave running at night & if in the close proximity of ones home can be heard & felt over the sound of the blowing & the refrigeration cars hum that penetrates your head with a high hum is almost a form of torture.

We have hauled in gravel for our flower beds along the embankment every year due to the sifting effect of the constant ground shaking from the trains.

State testing indicates 043
current levels of decibels average below standards

proposed in new E.P.A. regulations. Though unbelievable as it seems, if the rules are implemented we won't get any sleep at all.

The degradation clause is totally ridiculous. It will give the railroads license to degrade what is already an impossible situation.

We believe our local government should be allowed to make a curfew during the night prohibiting refrigeration [illegible] from parking, engines to idle, [illegible] running & switching before residences to allow 6 hours of uninterrupted sleep.

We have a bad problem with bank slippage along Eldridge Avenue. [illegible]

043

whether its is due to
underground springs or
whatever the constant
heating does it help
the situation.

Regarding LP&G case
We discussed the situation
with our local fire
Chief Mr. Bennett & there
is no plan in case of
an accident except
a warning whistle
on top of the Court
House which none of
us would hear at
night due to the high
noise levels we are
accustomed to in order
to get any sleep. Why is
there no penalty for 093
excessive monthly
impacts (crashes or
switching)?

A reply would be
appreciated

Mr. & Mrs. R. Tretwold
2015 Eldridge Ave.
Bellingham Wash
98225

1515 28th Avenue W
Seattle, WA 98199
May 31, 1979

Rail Carrier Docket No. CNAC 79-01
Office of Noise Abatement and Control (ANR-490)
U.S. Environmental Protection Agency
Washington, D.C. 20460

79-01-071

Gentlemen:

I would like to go on record as opposing the new regulation for noise from railroad yards which is presently being suggested by the Environmental Protection Agency.

This new regulation will allow more noise from railroad yards than has ever existed before in the Seattle area. We are home owners in the Magnolia area of Seattle and at the present time find the noise from the railroad yards of the Burlington Northern railroads in Interbay intolerable. Our sleep is disturbed at night and it is annoying even in the daytime. We would not welcome an increase in the noise from the railroad yards and will appreciate anything you can do to lessen it rather than increase it.

Thank you for your consideration.

Sincerely,

Mildred Weaver

Mildred Weaver

901

448 Sinclair Ave., N. E.
Atlanta, Georgia 30307
June 25, 1979

Rail Carrier Docket Number ONAC 79-01
Office of Noise Abatement and Control (ANR-490)
U. S. Environmental Protection Agency
Washington, D. C. 20460

Gentlemen:

After a review of the proposed expanded noise emmission regulation for the interstate rail carriers, I submit the following comments:

1. The regulation is generally based on L_{dn} noise levels which is the best overall noise impact evaluation measure. This measure does not take into consideration the impact of a single high-level noise event. The regulation is correct to include the L_{dn} regulation, but it should also include a maximum noise level measured in dBA, for a single event, particularly during the night hours as defined in the regulation.

2. Horns, Bells and Whistles: The EPA has incorrectly assumed that these "devices produce a form of noise intended to be heard for safety reasons". To clarify the intent, the regulations should state that the noise restrictions do not apply to "emergency warning devices". However, maximum single blast noise levels should be set for all other uses of horns, bells and whistles, for example shift change whistles. These maximum limits should be respectful of day/night response.

3. Equipment Noise: Apparently, this noise control is in addition to the property line standard. It should be clearly stated that this is the case, so that point source noise comes under the most restrictive limit. In this way a refrigerator car meeting the 78 dBA limit could not be parked near a rail carrier's property line unless there are additional noise control methods to meet the property line standard.

79-01-126

Thank you for the opportunity to comment on the proposed regulation and I would appreciate being sent a copy of the final regulation.

Sincerely,

Walter L. Wheeler

Walter L. Wheeler

June 18, 1979

Noise Abatement & Control

Washington, D.C.

23 JUN 79 11:16

RECEIVED ANR-490

Gentlemen!

A notice in our local newspaper states that de-control of noise abatement is being considered by the Environmental Protection Agency. We are shocked!

Our residential areas of Magnolia Bluff & Queen Anne Hill are bisected by acres of railroad tracks that service the enormous shipments of Datsuns and Toyotas from Japan. In addition, the same area has a Cargill Grain Elevator that is filled from grain cars both day and night.

We live on one of several apartment buildings just above and across from the elevator. The noise of trains moving and coupling makes sleep at night almost impossible.

Please do not reduce whatever control there may be at present! (2)

Sincerely,

Mrs. Glenn W. Whiteman
521 5th Ave. West   Apt. 1102
Seattle, Wa.
98119

EMPLOYEE BENEFIT SERVICE CORPORATION
3150 Bank of California Center
Seattle, Washington 98164
(206) 624-4894

May 1, 1979

Rail Carrier
Docket No. CNAC 79-01
Office of Noise Abatement & Control(ANR-490)
U.S. Environmental Protection Agency
Washington D.C. 20460

79-01-088

Re: More noise

Gentlemen:

We are definitely against "more noise" as suggested by the May 30, 1979 Magnolia News (copy of which is attached).

We have a young child who already has developed strong anxiety and "night terrors".

Often times he awakens convinced that the train noises and coupling of cars are already on our front door step.

Yours very truly,

Joe C. Whittle

Joe C. Whittle

cc: Senator Henry Jackson
Senator Warren Magnuson
Honorable David Moen
Honorable Joel Prichard
Honorable Joe Taller

-SAND ANR-490
12 JUN 79 11: 11

More noise could assault residential areas here

Residents of Queen Anne and Magnolia who live anywhere near the Burlington Northern railroad yards in Interbay may be in for more noise from those railroad yards than they've known till now.

The Environmental Protection Agency has proposed a new regulation for noise from railroad yards. According to Curt Horner of the Seattle-King County Health Department, the maximum permissable noise levels established in the new regulation will "allow more noise from railroad yards than has ever existed before in the Seattle area."

The regulation does not discriminate between the types of property that will be impacted. Car coupling, retarders and refrigerator cars will be allowed to emit as much noise in a residential area as in an industrial area. Noise from the Interbay yards reaches residential areas both to the east and west.

These residents, says the Health Department, "will find less protection from railroad noise with the new regulation than from currently existing regulations."

In addition to reduced protection from noise, the new regulation mandates some very technical equipment and methodology to measure railroad yard noises.

"Enforcement of the new regulations will require a higher level of expertise than current monitoring criteria," said Department spokesman Horner. "The expense of enforcing new regulations may be crippling to noise control programs that are barely surviving now."

Horner said the new regulations will not aid in maintaining high environmental quality and "may actually be degrading."

Public comment will greatly affect the outcome of the newly proposed legislation. The Seattle-King County Health Department Noise Control Program urges public comments against this proposal. Letters should go to: Rail Carrier Docket No. CNAC 79-01; Office of Noise Abatement and Control (ANR-490); U. S. Environmental Protection Agency, Washington, D.C. 20460.

Paper drive at Magnolia School

Magnolia School PTA is holding its fund-raising newspaper drive Friday, June 1, through Tuesday, June 5. Papers, tied or in a large grocery sack, may be brought to the collection van behind the school building. Attendants will be on hand each weekday morning, 8:30 to 9:30 a.m. and Saturday, 9 a.m. to one p.m. To have papers picked up, call Mrs. Phillips, 284-3217, Mrs. Simon, 283-6297, or leave a message at the school's office, 587-5022. Different delivery times can also be arranged.

Air-Conditioning and Refrigeration Institute
1815 NORTH FORT MYER DRIVE • ARLINGTON, VIRGINIA 22209 • TELEPHONE 524-8800
Area Code 703 Telex 89-2351

June 1, 1979

Rail Carrier, Docket Number ONAC 79-01
Office of Noise Abatement and Control
(ANR-490)
U.S. Environmental Protection Agency
Washington, D.C. 20460

SUBJECT: Proposed Rule for Noise Emission Standards for Transporation Equipment; Interstate Rail Carriers U.S. Environmental Protection Agency - Docket No. ONAC 79-01

79-01-059

Gentlemen:

The Air-Conditioning and Refrigeration Institute (ARI) is a national trade association whose members manufacture more than 90 percent of all U.S.-made air-conditioning and refrigeration equipment, as well as the components and materials used therein. The Scope of the Mobile Refrigeration Section of ARI includes mechanical-refrigeration systems designed for installation in railway freight cars, trucks, trailers and containers.

ARI appreciates the opportunity to comment on the "Proposed Rule for Noise Emission Standards for Transportation Equipment; Interstate Rail Carriers, " as it appeared in the April 17, 1979, Federal Register.

Covered Noise Sources

The proposed Rule is stated in Section 201.10(a) to apply to all locomotives (with stated exceptions), all rail cars in motion, all mechanical refrigeration cars when stationary, all car coupling operations, and all retarders. Sections 201.14, 201.15, and 201.16 are included to establish standards for mechanical refrigeration cars, for coupling operations, and for retarders. Section 201.26 establishes procedures for the measurement of retarder, car coupling, and mechanical refrigeration car noise.

It is apparent, therefore, that the Proposed Rule is not applicable to all of the noise sources listed as being significant in the Supplementary Information. We suggest that only those noise sources to which the Rule is to be applied should be listed.

The Supplementary Information to the Proposed Rule lists "trailer on flat car, container on flat car (TOFC/COFC)" as being a significant noise source associated with railyards.

We note that the EPA "Background Document for Proposed Revision to Rail Carrier Noise Emission Regulation" (EPA 550/9-78-207, February 1979) did not identify TOFC or COFC as a major noise source. (See Section 4, Page 4-1 of the Document.)

Data in Appendix B to the Background Document report that for a number of the railyards investigated, the noise sources of piggyback operations are the facility equipment, including the tractors loading and unloading the trailers on the flat cars, the wheel/rail noise of flat cars moving to and from the TOFC tracks and various banging noises which occur during the process of loading and securing the trailers onto the flat cars. These banging noises result from the raising and lowering of the flaps on the flat cars, which are used to hold the trailers in place. Other noise sources in some railyards are cranes used for loading and unloading trailers and containers onto rail cars.

ARI is concerned that the Proposed Rule will inadvertently be interpreted to include trailers and containers that may be loaded on flat cars. We do not believe that it is the intent of the Proposed Rule to do so. We urge that the EPA clarify this point in the final rule and specifically exclude trailers and containers.

Receiving Property Line Limits

The proposed Standard calls for L_{dn} 70 or less for all facilities and equipment measured at the receiving property line adjoining the railyard effective January 1, 1982, and L_{dn} 65 for hump yard facilities and equipment effective January 1, 1985. The proposed refrigerator car noise standard effective on January 1, 1982, is 78 dBA.

The Proposed Rule needs clarification on what additional noise abatement treatments, if any, are required for refrigerator cars in order to achieve the 5 dBA reduction in property line levels between 1982 and 1985. Clarification should be given as to whether it is safe for manufacturers of refrigerator equipment to assume that meeting the 78 dBA standard for refrigerator car noise will fulfill all requirements and that the property line standard will become the sole responsibility of the yard operator.

Compliance Cost

Section 5 of the Background Document discusses noise control technology and on page 5-8 makes reference to a report* which was submitted to EPA in 1976 but which has not been released or subjected to review and comment on technical content. It is in the public file and has been examined by at least one ARI member.

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* Noise Control Technology for Truck-Mounted Refrigeration Units, BBN Report No. 3264, submitted to the U.S. Environmental Protection Agency, March, 1976.

Based upon this report, the Background Document states, "The required technology for reducing noise emissions from mechanical refrigerator cars has been applied to truck and trailer-mounted refrigeration units. It contains a better muffler for the diesel engine and the application of sound-absorptive foam".

ARI is concerned that certain technical assumptions used in that report may not be correct, and that attempts to apply some of the noise control techniques described will be either ineffective or harmful to the equipment. For example, the use of techniques which reduce condenser air flow and increase engine operating temperatures are unacceptable. The refrigeration equipment may be damaged and its capability to refrigerate the car will be impaired. The BBN report should be released for review by EPA and comment by equipment manufacturers and other technically competent persons should be sought before the report is used as a basis for regulation.

The cost estimate given in Table 4.3 for noise abatement of refrigerator cars by means of mufflers and fan treatment are valid only to the extent that the BBN assumptions and analysis are valid. As noted above, we question their validity.

Refrigerator Car Test Procedure

The Proposed Rule stipulates the microphone position for the refrigeration car test is "..... any location 7 meters from the centerline of refrigeration car track, and between 1.2 meters above the ground and the height corresponding to the top of the refrigeration car." It does not specify if another rail car is to be coupled to the rail car under test and it states that the measuring position can be anywhere along the car. This specification is unacceptably vague.

If the rail car under test is coupled to another refrigeration car and the microphone, though located within the length of the rail car under test, receives sound from the coupled refrigeration car, the measured sound level may be higher than that which would be measured if sound only from the rail car under test were being picked up. We suggest, therefore, that the measurement criteria for the refrigeration car test specify that the rail car under test shall not be coupled to another rail car.

Specifically defined microphone locations are essential if both manufacturers and users of refrigerated rail cars are to be confident that the noise level developed by their products are within the prescribed limits They are also required if EPA expects to verify claims of conformance to the rule. We suggest that several microphone locations along the length of the rail car under test and at two heights at each location be specified, and that the resulting measurements be averaged. The results of such a test should represent accurately the sound generated by the refrigeration unit and its power supply.

ARI also suggests that the final rule take into consideration inconsistencies that may result because of yard layout and usage regarding the 78 dBA measured at 7 meters and the 70$L_{dn(24)}$ at the receiving line.

ARI hopes the above comments will be helpful to the EPA in the development of the Final Rule.

Sincerely yours,

John P. Reardon

John P. Reardon
Assistant Director of Public Affairs -
Federal Regulation

JPR/za

BANGOR AND AROOSTOOK RAILROAD COMPANY

Northern Maine Junction Park RR 2 Bangor, Maine 04401 (207) 848-5721

May 30, 1979
MF 96.1.1

Rail Carrier Docket Number ONAC 79-01
Office of Noise Abatement and Control (ANR-490)
U.S. Environmental Protection Agency
Washington, D. C. 20460

79-01-064

Gentlemen:

The Bangor and Aroostook Railroad hereby offers comments relative to Environmental Protection Agency's proposed Rail Carrier Noise Emission Standards.

We are aware of the legislation mandating the regulations and the effect of AAR's suit in expanding the standards initially promulgated by EPA. In this regard, we commend EPA for a reasoned and reasonable approach to the complex problem of railroad noise. It appears, however, that time limit pressures may have precluded a more specific analysis of railroad noise pollution in other than urban areas.

At risk of contradicting AAR's position, we must assert our strong belief that noise emissions from the Bangor and Aroostook Railroad have minimal adverse impact on the health and welfare of the citizens we serve. Conversely, compliance with the proposed regulations would have a significant impact on the financial health of this Company and ultimately have a negative effect on our ability to provide necessary economical rail service to the people of Northern Maine.

One must recognize that railroad noise is a significant problem in many parts of the country. The problem is not uniform, however, and a uniform national solution places an unnecessary compliance burden on carriers operating in lightly populated, rural areas.

The EPA background document indicates that six of this carrier's yards will be affected by the regulation. The six towns in which the yards are located have a combined population of approximately 30,000. BAR's two major switching yards are located in Hermon, Maine (population 2,500) and Oakfield, Maine (population 800). We estimate that fewer than 1,000 residents of the six affected towns have any auditory awareness of railroad switching operations. Recent noise measurements by FRA at crew sleeping quarters in these same locales lead to a conclusion that none of our neighbors are exposed to 65 Ldn or Leq from railroad switching operations. It appears, therefore, that we are now in compliance with the parts of the regulations dealing with receiving property noise limits.

Though BAR does not use retarders, it is suggested that the nature of this noise source does not differ from other fixed facilities within yards and should not be treated differently. Noise measurements at 30 meters from a car retarder are valid only when the retarder is located within 30 meters of receiving property. The same argument can be made in opposing a distinct and separate car-coupling noise standard. There does not appear to be a need for the specific standards at locations where noise from retarders and car coupling does not affect receiving property.

This Company's primary concern with the proposed standards is the expensive and, we believe, inefficient retrofits mandated for mechanical refrigerators and switching locomotives. BAR owns 331 mechanical refrigerators and 45 locomotives. All locomotives are commonly used in switching operations. EPA's estimates of costs of retrofit are as unrealistic as the estimated fuel costs of 32 cents per gallon. Without making a detailed analysis of the data, we believe the true costs of retrofit would likely be double EPA's estimate.

The methods suggested for quieting refrigerator cars are technologically questionable. Muffler design and associated costs for application to a 34 horsepower diesel engine appear to have been extrapolated from applications involving much smaller engines and are of doubtful validity. The mere addition of a more absorbent muffler to refrigerator car engines is expected to greatly increase maintenance costs attributable to altered back-pressure in the exhaust system. Similar objections can be made to proposals to apply mufflers to switching locomotives. The result would be increased fuel consumption and maintenance costs.

We suggest that locomotive noise standards be applied only to new equipment. This would allow noise control to be engineered into units for a more efficient result with far less financial disruption to the industry. Similarly, the standards for mechanical refrigerator cars could apply to new units or when new or rebuilt diesel engines are installed.

That part of the proposal dealing with load-cell testing seems to be directly at odds with previous EPA noise regulations. The previous regulation seemingly requires load-cell testing in a clear field situation; the new regulation contemplates enclosing the operation.

This Company must object to the conclusions reached by EPA's study relative to economic and employment impact on our modest operation. With identical data and considerable experience in railroad economics, we are unable to arrive at conclusions similar to those reached by EPA. Increased revenue needs with attendant rate increases may, indeed, divert traffic from rail to truck but we doubt that this effect can be quantified, as EPA has attempted to do. The history of econometric modeling clearly demonstrates the unreliability of predictions based on this process.

Assume that, as predicted, the nation's railroads do lose business to trucks as an indirect result of this regulation. EPA's broad goals and the interests of the public must be adversely affected. The energy efficiencies and minimal air and noise pollution of railroads compared with truck transportation must be recognized. Solutions to railroad noise problems which ultimately divert traffic to highways are backward environmental steps.

The enforcement aspect of the regulations contradicts and is inconsistent with providing a national solution to railroad noise emissions. EPA doesn't have the enforcement capability while FRA doubts its ability to monitor compliance. We are left with local and state agencies who will selectively inspect and enforce compliance. This enforcement scheme has been tried before with generally disappointing results.

Sincerely yours,

L. W. Littlefield
Vice President-Operations

AWD/jhb

BURLINGTON NORTHERN

LAW DEPARTMENT

176 East Fifth Street
St. Paul, Minnesota 55101
Telephone (612) 298-2121

June 29, 1979

Rail Carrier Docket Number ONAC 79-01
Office of Noise Abatement and Control
(ANR-490)
U.S. Environmental Protection Agency
Washington, D.C. 20460

Re: EPA Proposed Noise Regulations

Gentlemen:

Enclosed for filing are five (5) copies of Comments by Burlington Northern Inc., Colorado & Southern Railway Company and Fort Worth & Denver Railway Company in the above captioned proceeding. In addition to these comments the above referenced railroads support the comments of the Association of American Railroads.

Sincerely,

Ralph S. Nelson
Attorney

RSN:hk

Enc.

79-01-150

~RCVD ANR-490
3 JL 79 11:32

915

In the matter of

Environmental Protection Agency

Docket No. ONAC 79-01

Comments on Proposed Revision
to Rail Carrier Noise Emission
Regulations

Burlington Northern Inc.
Colorado & Southern Railway Company
Ft. Worth & Denver Railway Company

June 29, 1979

Burlington Northern Inc.; Colorado and Southern Railway Company
Fort Worth and Denver Railway Company
Comments on Proposed Revision
To Rail Carrier Noise Emission Regulations

After a review of the Environmental Protection Agency's Notice of Proposed Rulemaking for noise standards for railroad equipment and facilities and the associated Background Document, several questions and comments became apparent. The EPA's understanding of railroad operations and the railroad industry as a whole has improved since the outset of their rulemaking process. However, from comments and assumptions put forth in the Background Document, the EPA still lacks a total grasp of the industry's situation and problems in implementing the proposed noise standards.

EPA's General Approach

Major flaws exist in the EPA's analysis. These flaws weaken the foundation on which the regulations have been based. The most obvious of these flaws include an overestimation of the impact of railroad noise sources on the population, oversimplification of railroad yard facilities in the modeling techniques, and gross underestimation of the cost of compliance. Underlying these defects is the inescapable conclusion, demonstrated in the EPA Background Document itself and certainly well known to the railroad industry, that certain elements of the proposed standards go beyond available technology and are unattainable, unless the cessation of railroad operation is considered a technological alternative.

From an examination of the EPA's Level Document, there are indications that the EPA has overestimated the impact of railroad noise on the community. In Appendix D of the Level Document, the EPA indicated that the relationship between the normalized outdoor day-night sound level and community reaction appears to be a reasonably accurate and useful tool in assessing the probable reaction of a community to an intruding noise on the community. Nowhere in the Background Document did EPA make any attempt to normalize the proposed standards. A partial application of the correction factors for normalizing the L_{dn} levels is necessary. As will be shown in a following section in this text, "Application of Best Available Technology", the existing technology has a limited ability to reduce the L_{dn} levels. Therefore, applying positive correction factors to the measured L_{dn} will be of no value. With a limited ability to reduce the L_{dn} levels, adding positive correction factors will only produce a conflict situation where the L_{dn} levels are raised even higher than the actual measurements and because of limited technology, little can be done to correct the problem. The application of negative correction factors partially rectifies the EPA's overestimation of the impact of railroad noise on the community. Table D-8 of the EPA's Level Document lends support by indicating that there may be fewer complaints about railroad noise than other noise source types. Since speech interference is also considered a major factor in determining noise impact, the section in Appendix D of the EPA's Levels Document on "Speech Interference in the Presence of Fluctuating Sounds Levels" will apply. This section states, on Page D-6: "It is, therefore, concluded that almost all time-varying environmental noises with the same L_{eq} would lead, averaged over a long period of time to better intelligibility than intelligibility for the same L_{eq} values of continuous noise." The same may also be said for L_{dn}. This would apply to noises such as switch engine passbys, car-car impacts, retarder squeals, etc. Based on these facts, using only the negative correction factors will have very little change in the impact on the population.

Appendix B of the Background Document offers further support that the EPA overestimated the impact of railroad noise. Several studies performed by the EPA regional representatives had sections on "Subjective Impressions." These sections showed that the impact was not as great as predicted and applying an L_{dn} standard without adjustments will not have any major effect on complaints of railroad noise. A typical comment was that there were no complaints from residents nearest the rail yard because the people had become accustomed to the noise and were unaware of it until it was brought to their attention by visitors from outside the neighborhood. Other conditions and situations, as well as other noise sources, were considered much more serious neighborhood problems. Where complaints of railroad noise existed, specific sources of annoyance were cited by the residents. The most common sources of annoyance were car impact during coupling and retarder squeal. Studies in Appendix B point out that the contributions of the car coupling impact and retarder squeal to the measured L_{dn} are minimal. Other noise sources commonly cited as annoyances which will have no effect on the L_{dn} measurement because of their exclusion from the section of regulations, include through trains, whistles and bells.

Similarly, the EPA has overestimated the benefits of the regulations. In measuring the benefits of the regulations, the EPA assumed that lowering the noise level eminating from rail yards and shop facilities would reduce the exposure of the population by the same amount. Where the background noise level is low, this may be true. However, in areas of industrial or commercial operations or where major highways are nearby, this may not be true. Where the contribution of the railroad sources to the sound level at a given point has been brought to about 3dB below the total sound level due to all sources at that point, additional reductions in the railroad component will have little effect on the total noise level. In addition, any noise abatement procedures which reduce shipper demand for rail transportation services, whether because of increased costs or decreased service quality, may well divert traffic to other transportation modes which have a greater noise impact on the community.

Another serious flaw involves the modeling of a "typical" rail yard to determine noise control standards, versus actual existing rail yards which must conform with those standards. As was pointed out in the Background Document, rail yard facilities are complex and the physical characteristics vary considerably depending on the yard capacity and configuration. The EPA as regulator has certain obvious advantages in their modeling techniques. By modeling, the physical characteristics of all rail yards are typified and the configurations of all rail yards are simplified. This makes the job of setting standards much easier. However, the railroad industry in complying with the noise control standards, must deal with the complexities and variations. There are no provisions in the regulations for any problems associated with variations in rail yard facilities. Furthermore, the EPA has made no provisions in setting the standards for error in their sampling and modeling.

As will be shown in a later section, the EPA grossly underestimated the cost of compliance. Based on information gathered in the short period of time for public response to the proposed regulations, virtually all noise control methods will cost much more than indicated. The EPA estimate does not adequately reflect the costs of the releasable inert retarders, land acquisitions, rescheduling night operations, barriers for group and master retarders, spray systems at retarders, mechanical refrigeration car modifications and load test cell enclosures. In some cases, the EPA, did not include operating and maintenance costs and in other cases dated information was used. These errors invalidate the EPA's estimate on the cost of compliance and make the analysis of the economic impact on the railroad industry highly suspect.

Definition of Best Available Technology

A. The most serious fault in the proposed regulations is that the EPA is requiring more than "best available technology" to meet the noise standards which they have proposed. In both the Notice of Proposed Rulemaking and the Background Document, the EPA suggested that a change in operations may be necessary to meet these standards. A curtailment or elimination of certain nighttime operations is the most significant and unreasonable operational change suggested, although not the only such change that would be required. In the main text of the Background Document, the EPA glossed over the serious problems involved in changing operations dealing mostly with the incremental increase in the fleet of switch engines. To assess the expense of operational changes, some adjustments were attempted in Appendix L to quantify the cost of the yard expansion required to maintain current throughput while reducing to a two shift operation. The short period given for comment on the proposed regulations prevented any verification of this data. However, a much larger impact than discussed would result from "Rail service... adversely effected in certain areas due to yard or line bottleneck and congestion. Service effects which are negative could result in loss of business and revenue to water and motor carriers." The EPA made no attempt to quantify such problems which could have a profound effect on the economic impact analysis. The EPA placed too much faith, in what they referred to as "a certain amount of inherent flexibility" in the railroad system. Suggesting that nighttime operations be curtailed or eliminated tampers with interstate commerce and the viability of other industries which are dependent on the railroads for transportation of raw materials and finished products.

B. Another method of noise control mentioned was the extension of property lines beyond their existing boundaries to create a buffer zone for noise control. This is an objectionable approach to noise control and is flawed. The most obvious flaw is that it is prohibitively expensive. The estimated cost of land given by the EPA is low for several reasons. 1.) Currently, in many areas the cost of property of all types is rising at a rate much higher than 10 percent. 2.) The EPA analysis included only the land costs for all land classifications except single family units. These estimates did not include the cost of any structures which could significantly increase the total cost of the property, especially in highly developed urban areas, industrial parks, etc. 3.) Since the railroads would not be purchasing the property on the open market, but rather to satisfy legal requirements, they would likely, as a willing buyer, have to pay substantially above the market value. 4.) Many companies, both commercial and industrial, locate near or adjacent to rail yards because of access to rail transportation. These companies may be reluctant to relocate their facilities, as the cost of moving could be very high and in some cases not affordable. If this cost were passed along to the railroads, the cost of compliance will be further magnified. Related to this, there is serious doubt concerning the ability of the railroads to use the power of eminent domain to comply with noise control regulations.

Land use after purchasing the property will also be a problem. The EPA in the Background Document gave no guidance as to land use for this buffer zone. If the property is to exist in an undeveloped form, the cost of razing buildings must be added. Furthermore, larger parcels of property must be purchased since attenuation from existing buildings will be lost. Rather than putting the property in an undeveloped state, if it were developed as an industrial complex, while being owned or controlled by the railroad, the total exposure to the population in the form of the people hired to work in the industrial complex may, in fact, increase. Since there may be more people working adjacent to the noise source after the enactment of the regulation and redevelopment by the railroad, the total exposure may be greater. Similarly, the total impact in an industrial area may be negative in situations where an industrial plant is displaced and required to locate to an area where it may adversely impact on a residential neighborhood.

C. In the Background Document concerning "other techniques generally applicable to all noise sources..." it was mentioned: "turning off equipment not in use." In another section of the Background Document, the EPA considered the cost of shutting down locomotives not in use as being insignificant. It must be pointed out that locomotives do not have antifreeze in the cooling system because of leakage caused by thermal expansion and contraction of diesel locomotive engines. Requiring locomotives to be shut down during cold weather would cause serious problems. In addition, once shut down, the locomotive engine requires special manual lubrication prior to restart to protect vital engine bearings, requiring time and manpower to accomplish. Currently, several railroads shut-down locomotives whenever possible as an energy saving practice, but only under well-defined conditions which are established to protect the locomotives and the railroads' operations. To shut-down locomotives under other conditions could result in freeze ups of locomotive and serious mechanical damage resulting in substantial expense and loss of availability.

D. The EPA linked the idea of shutting down locomotives with the relocation of idling locomotives. The EPA's statements on this approach are vague. It is unclear whether the EPA is suggesting relocating the locomotives within a shop facility or anywhere necessary away from the shop complex to reduce the L_{dn}. Where feasible, it may be possible to relocate idling locomotives within the shop complex and use existing buildings as shielding mechanisms. To some extent this is done already in response to local complaints. However, at many locations, particularly in urban areas, relocation within the shop area will not be possible. Space restraints for storing locomotives is often a problem even without regard to noise control considerations. Over the life of many mechanical facilities, changes, as well as normal increases in rail traffic patterns have required originally small facilities to expand and modernize using virtually all available space. This is a common occurence and thus, many locations will not be able to accomodate relation of idling locomotives.

Any suggestion to relocate locomotives away from a shop complex is prohibitively expensive and potentially dangerous. Adopting such a course of action would cause problems of immense magnitude. The most obvious problems would include the following: a.) reduction inproductivity which would be particularly severe where large numbers of locomotives and/or large distances between the shop and the idling locomotives are involved b.) coordination of supervision and availability from a remote location, c.) vandalism d.) increased personnel, and e.) particularly in urban areas, there may be no acceptable location for the idling locomotives.

E. The lubrication spray system for the retarders was described in the Background Document as "best available technology". To our knowledge, the lubrication system at the Burlington Northern's Northtown Yard is the only such system in operation for retarders. A limited review of noise studies conducted at Northtown revealed there have been no organized or scientifically designed experiments to verify that the spray system significantly contributes to the noise reduction. The lubrication spray system is only part of an integrated noise control technique used at the master and group retarders. The contribution, if any, of the lubrication system is not known. There was some experimentation, often rather crude, prior to the design and construction of the spray system at Northtown. Since the system has gone into operation, its effectiveness has been based solely on subjective impressions. This is not an adequate basis for qualifying the lubrication spray system as "best available technology" or estimating the achievable reduction in the L_{dn} level.

Cost of Compliance

As was mentioned previously, the EPA understated the cost of virtually all proposed methods of noise control. The short period of time given for the response to the proposed regulations prevented a thorough examination of the EPA's cost estimates. However, the following comments on EPA cost estimates were gathered and are well within the railroad industry's experience.

a. Assuming that upgraded mufflers are available and sufficiently effective, the additional cost of installing upgraded mufflers on mechanical refrigerated cars will be twice as high as estimated by the EPA.

b. The cost of installing barriers at active retarders will typically be twice as high for normal installations as the EPA estimated. For locations where special problems are encountered, the costs will be much higher.

c. As was mentioned previously, the EPA underestimated the cost of land acquisitions. The estimates did not include the cost of existing structures (except for single family units), and if necessary, razing the existing structures. For many locations, the rate of inflation is much higher than 10 percent. This would apply to the land acquisitions for both buffer zones, if required, and yard expansion because of rescheduling night activities, if required.

d. The costs of rescheduling nighttime activities were also underestimated by the EPA. Besides underestimating the cost of land acquisitions for required physical expansion of railroad facilities, the EPA failed to quantify the adverse effect caused by the disruption of rail service and the resulting loss in business and revenue. Also not included were any additional costs and adverse impacts to industries which rely on rail transportation. Lack of time prevented further expansion on these costs.

e. The lubrication system for retarders were determined not to be necessary. However, the following information concerning the operating, maintenance and capital costs for such a system should be pointed out. With the lubrication system, an additional 20 percent of retarder length is required to provide the same amount of retardation. In addition, a collection system to catch the overspray is required beneath the retarders. The retarder would have to be shut down for an extended period of time for the track to be taken up to install the collection system and to extend the length of the retarder. To do this at the master retarder might very well shut down the entire yard.

At group retarders, more than just one track would have to be closed at a time. Safety of the workmen and track clearances would be of prime importance. In these situations cost of downtime in the yard will be a major factor in the total cost of the retrofit project.

A major operational problem exists in the winter. Despite the use of ethylene glycol as an antifreeze, the system is generally unreliable and virtually unusable because of icing problems. The lubricant solution becomes "slushy" in cold weather and as a result clogs the spray nozzles in the system. Piping freeze-ups have also been experienced even with a 50% solution of ethylene glycol and water.

The cost of using the lubricant was also neglected. The lubricant is composed of water, oil and, in cold weather, ethylene glycol. At the BN's Northtown Yard, approximately 33,000 gallons of ethylene glycol is required per year for freeze protection at an annual cost of approximately $84,000. The cost of the oil which must be continually added to the system as a component of the lubricant is also expensive.

An additional capital and operating expense is the treatment of wastewater and overflow from the collection system. Because of the presence of oil and ethylene glycol, a dissolved air flotation wastewater treatment system is required. The capital cost of the wastewater treatment system will add a minimum of $1 million to the cost of the system. Because of the high concentrations and oxygen demand of the ethylene glycol and the presence of the oil, the cost of the wastewater treatment plant operation becomes substantially greater.

Maintenance costs on a spray system are also extremely high. To fully maintain only the spray nozzles requires at least one additional man full-time. Solids picked up in the collection system and accumulated from biological growth in the lubricant mixture plug the nozzles. The use of screens and strainers in the system is not entirely effective. Rancid odors are also a problem from the biological growths, unless properly maintained.

The overspray requires up to 8 hours of cleanup prior to any extensive work on a retarder. Special precautions must be taken to prevent the slippery nature of the lubricant from making the general maintenance of the system a safety hazard to workmen. Disposal of the accumulated solid waste from the cleanup operation is also expensive as well as a problem in finding an acceptable site.

f. The EPA's estimate of enclosing a load test cell is low by a magnitude of five. The EPA's cost estimate does not adequately reflect the engineering and costs required for a load test cell enclosure including special air intakes and exhaust systems and sound proofing.

g. The EPA's estimate of the cost of installing releasable retarders was grossly understated. In the December, 1975 version of the Background Document, a cost of $7,500 per retarder was used for conversion of nonreleasable inert retarders to releasables. This cost did not include labor, downtime or operational costs as was noted in the Background Document. In the February, 1979 version of the Background Document, this cost was increased to $10,000 per retarder to cover inflation and labor. This figure was then used to estimate the major portion of the addition cost of changing the L_{dn} standard for hump yards from an L_{dn} of 70 to an L_{dn} of 65. This technique is totally inadequate and shows a lack of understanding of all that is required to install releasable inert retarders. The EPA's cost increase to $10,000 per retarder is arbitrary and excessively low. The cost used to determine the economic impact did not include any cost for downtime or operation. These factors will amount to a major portion of the total cost of this type of project. Although time restraints prevented developing any meaningful data on downtime and operational costs, a more accurate estimate to install the conversion mechanisms only (material and labor) is $33,000 per inert retarder. Furthermore, to operate releasable retarders in a hump yard, extensive additional controls are required to maintain a safe operating situation. A system is required to tie into a computer, the control of the switch at the headend of each bowl track and its releasable retarder at the pullout end. The controls involve the coordination of the switch at the head end and the releasable inert retarder so that both will not be open at the same time. This prevents cars from being humped into the track and rolling out the pullout end. These safeguards insure that when the releasable inert retarder is open, the head end switch is closed; conversely, when the head end switch is open, the releasable insert retarder is activated. These controls are not considered merely add-on accessories, but rather an integral part of the hump system required for the safety of workmen in the yard and the surrounding community.

The system includes electrical cables connecting the controls at each location (hump tower, head end switch and releasable retarder) and the necessary computer software and hardware. Costs for the computer software and hardware were not available. The cost of installing the cable is a minimum of an additional of $1/ft. for each track.

Application of Best Available Technology

After a thorough review of Appendix B of the Background Document including data gathered at the Burlington Northern's Northtown Yard and Cicero Yard, serious questions arise concerning the ability to meet the L_{dn} standards by applying best available technology. Data submitted to the EPA on the Northtown Yard and included in Appendix B of the Background Document indicate that it is unlikely that hump yards in general will be able to meet an L_{dn} standard of 65dB. Data gathered at Test Site #1 indicated it would be impossible to reduce the noise emitted from humping operations to a L_{dn} level of 65dB. Data from Test Site #1 are cited because Test Site #1 would be typical of a location that might be used to measure L_{dn} from humping operations. According to EPA predictions, the L_{dn} should be below the L_{dn} standard of 65dB. This is based on Table 7-4 of the Background Document. The Burlington Northern Northtown Hump Yard currently uses the following noise control technology, now being relied on by the EPA to meet the new standard:

a. Retarder Barriers
b. Lubrication of Retarders
c. Releasable Retarders

Even with these noise control techniques now in place, Northtown Yard will not meet the 1985 standard for L_{dn}. The location of the microphone was shielded from any load testing by the Diesel Repair Shop. Refrigerated cars would not have contributed a large amount to the L_{dn} readings because, in general, cars do not spend extended periods of time in the bowl tracks and make no contribution to the L_{dn} measurement unless located on the first few tracks nearest the microphone location. If positioned on other tracks, shielding by adjacent cars would minimize their impact. Based on this information, the standard of 65 L_{dn} should have been easily achieved. Yet the L_{dn} measured exceeded the L_{dn} standard of 65dB by 8-9dB. There is no additional technology available that will reduce the L_{dn} measurement. It is safe to assume other yards will have the same difficulty in applying "best available technology."

Data gathered at the Burlington Northern's Cicero Yard revealed a group of noise sources not addressed by the EPA in the Background Document. These noise sources originate from TOFC facilities. The report included in Appendix B of the Background Document indicated the predominant noise source at Site #1 as being the movement of tractor-trailers to and from the loading and unloading facility.

In this case, the railroad has no control over the noise sources. The tractor-trailers may achieve any applicable EPA product standards for trucks and still cause the L_{dn} standard to be exceeded. Furthermore, little can be done to reduce the noise from metal to metal contact in the loading and unloading at TOFC facilities. The EPA also did not address the costs that would be incurred for any noise controls that might be possible at TOFC facilities.

Recommendations

The proposed regulations are the result of oversimplification of the problems of noise control in rail yard facilities. The economic impact of the regulations is invalidated by gross inaccuracies in the cost of compliance. As a result, the proposed regulations are not valid regulation of railroad noise, but rather arbitrary, unsupportable and, in a large part, unachievable standards. The following modifications are recommended.

1. The portion of the regulations covering car-coupling makes the exception for cars traveling less than 4 MPH virtually unusable as a defense in an enforcement action. As written, the railroads must prove that the cars were coupling at speeds less than 4 MPH at some time after the noise readings are taken. This would be virtually impossible. A more acceptable approach is placing the burden of proof on the enforcement agency. The enforcement agency must measure the speed of the freight cars at the time the noise measurements are taken.

2. Allow railroads to use either the same modeling techniques as the EPA or actual noise measurements to determine compliance of existing yards. Where compliance is shown, no further noise control would be necessary. Where existing yards are not shown to be in compliance, allow each existing yard to be studied for adaptability of acceptable technology. This will be necessary because of the complex configuration and the variations in the physical characteristics of rail yard facilities. At each of these existing facilities, the following noise control methods will be considered based on its feasibility for adaptation and the contribution of the noise source to overall noise level (L_{dn}):

   a. Relocating or enclosing load test cell facilities.

   b. Relocating idling locomotives within the same shop complex to shield adjacent property owners using buildings or other structures in the shop area.

c. Installation of retarder noise barriers wherever track clearance and other engineering considerations will allow.

d. Eliminating load tests during the night time period of measurement of L_{dn} (22:00-07:00)

e. Adaptability of ductile iron retarder shoes to existing retarders.

f. Retrofitting existing hump yards with releasable inert retarders.

Technology which would not be considered in the study of individual yards include the following:

a. Spray Lubrication systems associated with active retarders. Because of maintenance and operational problems previously mentioned, this cannot be considered proven technology and, therefore, goes beyond the cost issue.

b. Rescheduling of night time classification of freight cars. This is not a viable noise control technique.

c. The puchase of property as a buffer zone. This not a reasonable alternative.

It is proposed that the definition of "feasibility" for this recommendation be based on a measure of benefit/cost ratio similar to the system used by the EPA in Appendix L of the Background Document. The EPA examined the benefit/cost ratio on a nationwide, industry wide basis. To be equatable to both the railroads and the population, the benefit/cost ratio should be used on a site by site basis when determining the technology noise control to be installed. At locations where additional control measures are required, the additional equipment would only be installed when the benefit of the equipment is 10 times the cost. This ratio was the level predicted by the EPA for the current proposed regulations. As the EPA states in Appendix L, it would be irrational public policy to require large amounts of money to be spent in areas where no one would benefit from them.

3. For existing rail yards, a variance system should be established. Again because of the complexities of existing rail yards, the use of all acceptable, feasible noise techniques as defined above in Item 2 will not reduce the noise level to the standard set by the EPA at some locations. At these locations, compliance will be established by the installation of all acceptable, feasible noise control measures and a periodic review of technology to determine if further control methods have become acceptable and feasible.

4. Proposed yards which are not yet in the design stage one year from the promulgation of the regulations should be required to be designed using modeling techniques to meet the L_{dn} standards set in the final regulations. Because of long lead-time requirements, proposed yards in the design stage prior to one year from the date of promulation of the regulations will be considered to be "existing" and, therefore, Item 3 above would apply.

5. The use of industrial, commercial and agricultural land as well as undeveloped land as a buffer zone without requiring it to be purchased. The L_{dn} method overestimates the impact on these land classifications. Few industrial, commerical or agricultural operations involve critical activities related to annoyance to noise such as sleep and leisure-time recreation. Furthermore, few industrial, commercial or agricultural facilities operate 24 hours a day. They also have their own noise sources which will mask much of the noise from rail yards.

6. Delete from the measured L_{dn} noise sources within the railroad facilities over which the railroad has no control. An example of this would be trucks entering and leaving TOFC facilities.

7. Where applicable, allow the application of the negative correction factors to the measured L_{dn} to normalize the L_{dn} level. Limitations of existing noise control technology to reduce the noise levels make the application positive correction factors useless and impossible to deal

These recommendations are based on information and data that were immediately available. The absence of any comments on other portions of the proposed regulations should not be interpretted as a sign of acceptance of those portions of the regulations and the premises on which they were based. Rather, it reflects a lack of time and resources for further investigation and comment. Further research would be required to evaluate and comment on the EPA's technological claims on noise control methods not covered in this text. However, there are indications that all EPA estimates on the cost of compliance are low. For virtually all noise control methods which were investigated, the EPA's estimate of the cost of implementation are dated and inadequate. The degree of inaccuracy involved invalidates the EPA's analysis of the economic impact on the railroad industry.

Because only a limited amount of technological evaluation was conducted by the Burlington Northern on the noise control methods proposed by the EPA, no attempt has been made in this text to determine the effectiveness of the individual control methods. Without this type of information, achievable levels cannot be determined. However, the technical background data and comments submitted by the Association of American Railroads were reviewed and found to be valid. The intent of this data and comments, in addition to the information submitted by the AAR is to provide sufficient updated information on which the regulations can be revised to reflect econonomic reasonableness and achievable technology.

Respectfully Submitted,

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CONRAIL

RICHARD B. HASSELMAN
SENIOR VICE PRESIDENT
OPERATIONS

79-01-134

July 2, 1979

Rail Carrier Docket Number ONAC 79-01
Office of Noise Abatement and Control (ANR-490)
U. S. Environmental Protection Agency
Washington, D.C. 20460

Dear Sirs:

The Consolidated Rail Corporation (Conrail) offers to E.P.A. the enclosed comments on its April 17, Proposed Noise Emission Standards For Transportation Equipment.

Conrail, the Nation's largest freight rail carrier with over 85,000 employees, appreciates the opportunity to submit comments. This corporation will be significantly affected by E.P.A.'s final rulemaking.

Conrail hopes that the enclosed data and information will be useful to E.P.A. in its final rulemaking. Please contact Mr. Jeffrey Teitel, Director, Regulatory Affairs at (215) 594-4168 if you have any questions concerning these comments.

Sincerely yours,

RBHasselman

RECD ANR-490
2 JUL 79 16:02

CONSOLIDATED RAIL CORPORATION SIX PENN CENTER PLAZA PHILADELPHIA, PA 19104

COMMENTS ON
PROPOSED EPA NOISE REGULATIONS
FOR INTERSTATE RAIL CARRIERS

The Consolidated Rail Corporation (Conrail), the largest freight rail line in the United States with over 85,000 employees and operating in 16 states, appreciates the opportunity to comment on the Environmental Protection Agency (EPA) April 17, 1979 "Proposed Noise Regulations for Interstate Rail Carriers." Conrail believes that uniform regulations are essential to avoid a myriad of conflicting local regulations.

Conrail supports efforts to improve the environment in which the railroad operates. In fact, since April 1, 1976, Conrail has spent several millions of dollars to ensure that its facilities conform with existing regulations.

INTRODUCTION

The following comments reflect Conrail's good faith effort at reviewing EPA's Proposed Noise Regulations. Conrail took a constructive approach by offering alternatives to specific regulations where appropriate or feasible. In many instances, Conrail believed that it was not appropriate to offer suggestions in the absence of empirical, substantive data. Conrail suggested throughout its comments that EPA develop relevant information to establish its noise limitations.

The information and comments offered by Conrail are divided into four chapters addressing public health and welfare, best available technology, costs to comply, and the proposed regulations themselves. Conrail hopes that the following will assist EPA in its promulgation; Conrail expresses its willingness to discuss with EPA any matters relating to the following comments.

I. HEALTH AND WELFARE

Section 2(b) of the Noise Control Act of 1972, P.L. 92-547 ("The Act"), states:

> "The Congress declares that it is the policy of the United States to promote an environment for all Americans free from noise that jeopardizes their health and welfare." (Emphasis Supplied).

Conrail believes that the U.S. Environmental Protection Agency (EPA) has attempted to promote a more noise-free environment as evidenced by its April 17, Proposed Noise Emission Standards for Transportation Equipment for Interstate Rail Carriers. Nevertheless, Conrail submits that EPA has not justified or substantiated a relationship between its noise limitations and thresholds affecting health and/or welfare.

The EPA document providing a basis for its proposed regulations, "Background Document for Proposed Revision to Rail Carrier Noise Emission Regulations ("The Document"), fails to provide data to demonstrate railroad noise impact on health and welfare and to provide a basis for its regulations. The railroad industry has been regulated through most of the history of the United States; its rail systems are geographically pervasive. If none had been collected, EPA should have developed some substantive health data so that rational, realistic and relevant limitations could have been established.

EPA has based the need for and value of these proposed regulations on a model which fails to assess accurately the number of people and the extent to which these people are affected. EPA states that public health (and welfare) benefits may be quantified both in terms of reductions in noise exposures and, more meaningfully, in terms of reductions in adverse effects. EPA cited time exposure of railroad noise as a function of the impact on health and welfare but without relevant data involving railroad noise. Conrail submits that the relative benefits and detriments of noise reduction cannot be assessed without more substantive, empirical data.

Although noise interference effects can reportedly be quantified, EPA states that a lack of time and resources precluded such calculations. Instead, EPA offers "predictive analysis" with reference to some photography and census data. Conrail submits that the model described in the Document cannot substitute for quantified information considering the impact regulations based on this inadequate model will have on the railroad industry.

EPA's basis for the Proposed Regulations includes averages, groupings, estimates, assumptions, etc. which have led to some very arbitrary noise limitations. EPA's reliance on this modeling technique as a result of limited time and resources should have resulted in some flexibility in noise limitations for ambient and point sources. Flexibility in the form of a range of numbers or range-guideline would have allowed for appropriate noise-related variables at different locations and would still be capable of protecting health and welfare.

Frequency or pitch is one technical variable upon which EPA could have focused in a guideline: the human ear discriminates naturally against low-frequency sounds. Therefore, humans can tolerate more low-frequency noise than high-frequency noise. Hearing loss frequently begins when ears become less sensitive to higher frequencies. Sound-pressure levels are not accurate indicators of loudness because frequencies influence the human reaction to the sound. EPA should have considered drawing some distinctions among railroad noise frequencies in its regulations.

EPA in its proposal established a noise measurement indicator stating:

> "This indicator correlates well with overall long term effects of noise on the public health and welfare...."
> (Background Document, Page 6-5).

The reference that EPA cited for establishing the indicators for estimated day-night average sound levels (L_{dn}) and average equivalent sound levels (L_{eq}) and their relationship to health and welfare is "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety," EPA (March 1974). This reference seems less than adequate as a primary resource for developing railroad noise regulations.

This 1974 publication was based on analyses, extrapolations and evaluations of the then-present state of scientific knowledge. On page 7 of the "Foreword," it is stated in part:

> "Not all of the scientific work that is required for basing such levels of environmental noise (to protect public health and welfare, etc.) on precise objective factors has been completed."

This section states that the reference's use of "health and welfare" applies, "[t]o those levels of noise that have been shown to interfere with the ability to hear...." This reference simply fails to address railroad noise specifically; it also fails to cite a single railroad noise study in its 102 listed references. The limited value of this EPA reference as it applies to the Proposed Railroad Noise Regulation is stated on Page 8:

> "The general purpose of this document is rather to discuss environmental noise levels requisite for the protection of public health and welfare without consideration of those elements necessary to an actual rule-making."

Absent detailed health data relating to railroad noise, EPA may have intended to concentrate its protection more broadly on the Nation's welfare. Nevertheless, EPA fails again to present sufficient data or demonstrate which reductions in railroad noises would protect the Nation's welfare.

EPA suggests that the term welfare should include personal comfort arising from disturbances and annoyance. However, annoyance *per se* is not a legal concept; it merely expresses what amounts to a wide spectrum of individual human response and not the cause. Yet the proposed regulations refer to "annoyance" as a legal threshold concept. The Background Document expressly admits "[s]tress, response cannot be quantified." Page 6-2. The Document speculates on the meaning of "stress response";

> "[S]ome of this stress response may be reflected in what people express as 'annoyance,' 'irritation,' or 'aggravation.'" Page 6-3.

Irritating and aggravating disturbances are subjective. Subjective loudness is a function of magnitude or pressure and of frequency; there are different subjective responses to each of the octave bands. EPA's data do not satisfactorily demonstrate the impact of disturbances on the Nation's welfare from railroad noise.

Factually, railroads have been operating in the Northeast more than 125 years, and "discomfort" has not thwarted residential and commercial development near railroad facilities. Nor has EPA cited such as an issue in this development.

EPA states in Part 4, in the "Health and Welfare" section of the preamble to the proposed regulations, "[t]he only utility of noise reduction is the protection of health and welfare." Neither the Proposed Regulations nor the Background Document cite or focus on economic data related to railroad noise impact on welfare. EPA's mathematical model for predicted impact from railroad noise is based upon many inaccuracies, omissions and unfounded conclusions. These criticisms are documented in Chapter 4, "Wyle Research Report," WR 79-10, entitled "A Review of the Railroad Yard Noise Standards as Proposed by the EPA on April 17, 1979," which is being submitted to EPA by the Association of American Railroads.

EPA's calculations in assessing the cost of compliance with the Proposed Regulations are strictly theoretical.

Conrail offers its cost projections beginning on page 21 which are based on compliance costs for all yard facilities. Conrail submits that these costs to industry would have a more direct and immediate impact on the Nation's welfare than the parochial and geographically limited impact of noise regulations on adjacent property values.

EPA should also consider the economic impact on many of Conrail's 85,000 plus employees and its thousands of customers if railroads are compelled to spend excessive sums to comply with these Proposed Regulations. DOT Study 503/901 indicates that railroads in the United States have a rate of return of .86% with a projected capital shortfall between now and 1985 of approximately $13 to $16 billion. Taxpayers are expected to pay more than $4 billion to keep trains operating during this period.

In his State of the Union message in January 1979, President Carter signaled reform of regulation as an important theme for this year. He said:

> "We must begin to scrutinize the overall effect of regulation on our economy .... This year we must begin the effort to reform our regulatory process for the railroad, bus and trucking industries. America has the greatest economic system in the world. Let's reduce government interference and give it a chance to work."

Railroads are over-regulated, treated today as if they were still the monopoly freight carriers that they were 40 years ago. In recognition of the changes in the transportation marketplace, the U.S. Department of Transportation (DOT) is advocating significant rail deregulation, largely because without it the rail industry will not be able to survive in the private sector. The alternative is nationalization, an extremely costly way of preserving essential rail service. The Administration, as represented by DOT, has a definite commitment to a strong, viable, private sector rail industry.

Congress has also evidenced a similar commitment through the passage of the Regulatory Reform and Railroad Revitalization Act of 1976. Congress has authorized and appropriated substantial amounts of money to support rail service, but insisting that these funds be invested in such a way as to enhance the continuation of the rail industry in the private sector.

The public welfare, if evaluated in light of these commitments, is enhanced by rail service. Any new regulations, whether in the noise or any other area, must take into account the impact they may have on the ability of the railroads to meet the public welfare goals set by the Congress and the Administration. The proposed noise abatement regulations, if implemented, would make it difficult, if not impossible, to achieve those goals.

Section 5(a)(2) of the Act states that the EPA Administrator is required to establish criteria for noise and to "publish information on the levels of environmental noise the attainment and maintenance of which in defined areas under various conditions are requisite to protect the public health and welfare with an adequate margin of safety." (Emphasis supplied.)

EPA has not demonstrated empirically that the costs associated with the proposed regulations are commensurate with the alleged benefits. EPA must offer some evidence that the rail operations which they seek to control have adversely affected the public health and welfare.

Conrail urges EPA to reconsider the limitations prescribed in its proposed noise limitations. EPA should review available information and develop new empirical, substantive data that is "[r]equisite to protect the public health and welfare ...." EPA should consider taking all readings at the property line as it is these sound levels which could affect the general public.

II. NOISE ABATEMENT TECHNOLOGY

Section 17(a)(1) of the Act states, in part:

> "[S]uch proposed regulations shall include noise emission standards setting such limits on noise emissions resulting from operation of the equipment and facilities of surface carriers engaged in interstate commerce by railroad <u>which reflect the degree of noise reduction achievable through the application of the best available technology, taking into account the cost of compliance</u>." (Emphasis supplied).

Congress in passing the Noise Control Act of 1972 was concerned over the Nation's quality of life, dissatisfied with the functioning of common law and undesirous of a proliferation of local regulation. Congress wanted to protect the Nation's health and welfare by limiting noise through uniform regulation. Congress intended that best available technology (BAT), a dynamic concept, be used as a technology-forcing mechanism. Neither the Act nor the regulations officially define BAT for railroad noise; EPA was "guided" by a definition in its preamble:

> "'Best available technology' is that noise abatement technology or technique available for application to equipment and facilities of surface carriers engaged in interstate commerce by railroad which produces the greatest achievable reduction in the noise produced by such equipment and facilities."

BAT has been described by EPA in other regulatory noise schemes as that technology which is applicable to equipment and performs the greatest noise reduction. As a matter of record, documentation exists that noise BAT is available to reduce aircraft and motor vehicle noise to protect the approximately fourty-four million affected people and control noise levels to within tolerable limits.

EPA's mis-characterization and incomplete assessment of BAT were products of its testing methodology. As EPA knows, noise resulting from railroad facilities is a complex mixture of sound which may be generated by many noise sources. Existing sound monitoring equipment does not - and did not for EPA - distinguish railroad noises from non-railroad yard noises such as adjacent highway noise and overhead aircraft noise. The timing and positioning of EPA's noise monitoring resulted in sharply differing reported noise levels. EPA's absence of demonstration is obvious.

EPA alleges that the BAT cited in its Background Document is "proven technology" for railroad noise. Conrail submits that EPA's assessment of existing BAT is incorrect; the Agency has not clearly established whether the benefits to be gained justify industry's investment in the purported BAT.

EPA should have demonstrated BAT to be technically feasible and compatible with all safety and environmental regulations to wit, regulations pursuant to the Occupational Safety and Health Act of 1970 and safety and health regulations enforced by the Federal Railroad Administration. For example, the use of load cell sites would result in undesirable employee exposure to exhaust fumes, excessive noise levels and safety hazards associated with confined space and moving locomotives. EPA should have determined also whether the purported BAT would present any operational or maintenance problems.

EPA's testing of noise barriers failed to consider the following variables and consequences: EPA tested barriers using different monitoring locations before and after barrier construction; the controlled microphone monitoring positions used by EPA recorded lower sound levels but EPA's reported 20db reduction from the use of barriers did not reflect in their test results the different barrier orientation or angle in relation to the noise source and property line. More measurements at the same and different locations would have revealed the daily noise-fluctuations and provided for more reliable data and valid assessments.

As documented in Sections 1.3 and 5, "Wyle Research Report," WR 79-10, "A Review of the Railroad Yard Noise Standards as Proposed by the U.S. EPA on April 17, 1979."

some non-absorptive barriers may serve to channel noise toward their open ends resulting in redistributed noise levels; snow would build up between any kind of a barrier creating a maintenance problem and employees working between barrier walls would be endangered in confined areas by moving trains with limited visibility. Barriers are frequently not physically satisfactory or possible for point source or property line noise control in yards due to inadequate space and elevation of humps. There are many locations in the Conrail System where barriers would preclude minimum clearance for maintenance and operation. EPA has not assessed the utility, cost and impact of barriers satisfactorily; they should not fall within the category of BAT based upon EPA's narrow findings. EPA should consider offering noise limitation variances where railroads can show that their facilities are fundamentally different due to technological economic infeasibility or physical impossibility.

Conrail submits that EPA has misrepresented various noise abatement equipment as "proven technology." Major engineering issues arise from EPA's proposed yard modifications as follows:

There is insufficient clearance between tracks in most existing yard layouts to accommodate noise barriers. As a result, the fan layout of the yards would require modification. This is discussed in detail elsewhere in Section III.

- Extensive concrete construction would shut down all or part of the yard if precast concrete sections could not be used. Concrete poured on-site can require from 7 to 28 days to cure to reach its full load-bearing strength.

The operational impact attributable to yard modifications but not readily quantifiable include:

- Delays in traffic due to rehandling (i.e., multiple switching).

- Increased per diem and transportation costs due to less efficient handling and added train miles (out of route).

- Reduced car utilization.

- Deterioration of service (longer transit times, less available equipment).

- Erosion of traffic and revenues.

The accomplishment of hump yard modification would take at least ten years to accomplish, even under ideal conditions. This assumes that Conrail would proceed at the rate of two classification yards per year; it should be noted, however, that in each case, construction would require from one to three years to complete.

As documented in comments submitted by the Association of American Railroads (AAR), only a few railroads have used the BAT that EPA has characterized as "proven" but not without breakdowns or undesirable side effects. Ductile iron shoes to reduce retarder noise tend to break down after short-term use; they are not sufficiently durable for use in daily operations; and they are still in the developmental stage. Similarly, releasable retarders have earned the same reputation based on their poor performance record. Lubricating systems, also used to reduce retarder noise, unfortunately reduces the brake friction or resistance coefficient and create an undesirable oil pollution runoff problem. Generally, the noise abatement technology suggested by EPA to reduce a particular noise source fails to adjust to different activity levels.

EPA may not have cited the following as BAT if it had performed some demonstrations: EPA's quick conclusion of BAT availability for refrigerator cars, based on noise measurements from trucks, failed to consider that trucks emit 1/4 of the accoustical energy given out by refrigerator cars. Wyle Report, Section 1.3. Improved exhaust muffling is not feasible on many of the switch engine locomotives without obscuring the engineer's view because the muffling increases the size of the exhaust pipes on the front of the engine; and even if EPA's suggested BAT - exhaust mufflers, cooling fan treatment or engine shielding - were used, noise attenuation would be de minimis. Whether or not the 5dB reduction cited in Section 5 of EPA's Document from muffler use holds true depends on the locomotive throttle position. BAT for fans and engines is not cost effective since these are non-dominant noise sources except at high throttle settings.

Noise levels from coupling cannot be attenuated by any known durable cushioning materials. The speeds of cars rolling off humps cannot be effectively gauged or controlled all of the time. During Conrail's first quarter in 1979, the 4 mph performance goal, based upon a 15,000 car sample, indicates attainment in only 35.8% of the time:

MPH	Number	%
0-3.9	5,437	35.8
4.0-4.9	3,846	25.3
5.0-5.9	3,656	24.1
6.0-6.9	1,285	8.4
7.0 +	968	6.4
Total	15,192	100.0

The 4 mph goal applies to ideal conditions; facility design, maintenance and existing operating technology require an additional tolerance of 1.0 mph. Conrail plans to delete the 4 mph speed from its operating rules, effective October 28, 1979. Currently, there are other restrictions which discourage "overspeed," 6.0 or more miles per hour.

Alternative noise control options such as the shutdown or relocation of locomotives, reduction in operations and land acquisition for buffer zones are often neither possible nor economically feasible.

It has been standard operating practice on Conrail and most U.S. Railroads to keep diesel-electric locomotives idling when not in actual use. This practice was found necessary because the diesel engine protects itself from mechanical damage and abnormal wear when it remains at operating temperature.

Temperature is important because it insures proper mechanical fit between mating parts and gaskets and provides proper lubrication between moving parts. Water and oil leaks are thereby reduced and the potential for damage through cold start-up is minimized.

When a diesel engine is permitted to cool during a prolonged shut down period, the metal parts contract and water can leak into the combustion chamber (cylinder) and on top of the pistons. When the engine is restarted, the water on top of a piston cannot be compressed and serious mechanical damage results, usually a broken connecting rod, piston cylinder liner, or any combination thereof. Additionally, after prolonged shutdown (8 hours or more), the lubricating oil will drain from the bearing surfaces and into the sump (crankcase). When 40 weight lubricating oil becomes cold it will not flow readily when the engine is restarted. Therefore, moving parts incur extraordinary wear and possible damage when a diesel engine is restarted cold after a shut down.

In sub-freezing temperatures, a shut down locomotive must be protected from freeze damage to its water-activated cooling system. Generally, this protection must be provided from October through April in Conrail's operating territory. Anti-freeze solution in the cooling system is not feasible because of the danger to moving parts if the coolant should leak into the lubricating oil. Anti-freeze can cause damage to bearing surfaces and serious mechanical failure.

Another compelling reason for keeping diesel engines running and at operating temperature is the fact that at relatively low temperature, i.e., below 40°F., it is virtually impossible to start a diesel engine using the locomotive starting batteries. This phenomenon results from the viscosity of the cold lubricating oil, reduced lubrication on bearing surfaces, reduced efficiency of starting batteries at low temperatures, and the inability to achieve firing temperature in the combustion chamber through compression. The use of ether to assist in starting diesel engines is hazardous to both employees and equipment and is expressly prohibited by Conrail policy.

Relocation of locomotives and a change in operations would require more track, land, locomotives, crews, fuel and supervision. Railroad operations and concomitant maintenance activities are continuous and do not decrease with the onset of night. Similarly, traffic patterns are continuously changing. Locomotive relocation or operation curtailment during the night is less feasible and practical for railroads than for trucks and planes, since the continuous rail traffic is confined to movement on available and unblocked rails. These suggested noise abatement alternatives are not tantamount to BAT and clearly indicate EPA's failure to understand the logistics and timing of railroad operations.

EPA should reexamine the technology it has cited as BAT, perform demonstrations where appropriate, consider existing BAT performance records and reassess the technological and economic impacts in the context of actual operating practices and overlapping regulations. EPA should consider a variance where it is technologically not feasible to apply BAT. Finally, EPA should offer its technical findings to the railroad industry for its comment since this is where resides the greatest expertise.

III. COSTS OF COMPLIANCE

a) Summary

1. Capital Investment

Conrail has estimated that a capital investment of $371.7 (in 1979 dollars) would be required, using best available technology, to achieve compliance with the EPA's proposed Noise Emissions Standards for Transportation Equipment. The details of these costs are provided in Apps.II & III included in this document: Appendix II summarizes the costs that constitute the $371.7 million; Appendix III provides more detail on the estimated costs of modifications to yards.

The investments required for compliance with the proposed standard would have a devastating impact on Conrail's capital investment plans - - plans that are considered integral to the company's re-establishment as an economically viable enterprise. The impact of enforced investment would be felt particularly strongly in two of Conrail's capital budgeting categories - - the Additions and Improvements (A&I)

Program and the Non-Revenue Equipment (i.e. locomotives, cabooses, work equipment, etc) Program. Of the $371.7 million investment required for compliance with the proposed standards, $273.5 million, or 74 per cent would replace projects in the A&I Program. The remaining $98.2 million would displace projects in the Non-Revenue Equipment Program. In order to achieve compliance with the proposed standards, the investments would have to be made in the 1980-81 budget years. Since the current Conrail Five Year Business Plan (FYBP) forecasts a total A&I Program expenditure of $283.9 million for the years 1980 and 1981, the investments required for compliance would displace 96 per cent of the prepared A&I Program. Likewise, the FYBP projects a total expenditure of $313 million on the Non-Revenue Equipment Program in 1980 and 1981; of this amount, $92.4 million has been targeted in the FYBP for expenditures on modifications to existing locomotives. The investments in Non-Revenue Equipment required for compliance constitute 32 and 107 per cent, respectively, of the foregoing categories for the combined 1980 and 1981 budgets.

Displacement of planned projects would also result in a significant opportunity cost. The A&I Program, in particular, focuses on savings to be derived from replacement of obsolete and inefficient fixed plant. The estimated savings that would be foregone by displacement of planned A&I projects include a recurring annual saving of $76 million through at least 1984 for investments made in 1980, and a recurring annual saving of $67.2 million through at least 1984 for 1981 investments.

As can be seen from the foregoing discussion, Conrail believes that the cost of compliance is much higher than EPA's initial estimates. We believe that some of the primary reasons for the variance in cost are due to the unique geographical and operational characteristics of the Conrail system, as follows:

- Proximity of classification yards, locomotive terminals, and industrial support facilities to population centers in the industrial Northeast.

- Extent of switching activity associated with a terminal intensive (i.e. many yards) operation in Metropolitan areas.

- Physical characteristics of older yards with steep grades and relatively short distances between the crest of the hump and body of the yard.

- Generally unavailable and prohibitively expensive real estate surrounding facilities.
- Variety of locomotives performing or subject to switching service.

2. Recurring Costs

In addition to the capital investments discussed in the preceding section, Conrail also anticipates significant other costs associated with compliance with the proposed standards. The cost of out-of-service time which is casually dismissed by the EPA's proposed standards, is estimated very conservatively at $20.3 million; this figure is clearly understated because it does not include any cost for what would undoubtedly be a significant amount of out-of-service time in yards while modifications were taking place. Additionally, Conrail estimates that an annual recurring maintenance cost of $10.1 million and an annual recurring cost of operations of $14.1 million will also result from compliance with the proposed regulations. Again, these estimates do not reflect any recurring operational or maintenance costs due to yard modifications.

CONCLUSIONS

While it has been demonstrated that the employment of all BAT could subject Conrail to direct capital requirements of $372 million, the added burden of service degradation and other recurring costs cannot be readily identified. Thus, it is clear that the standards, as proposed by EPA, would have a most serious effect on Conrail's operational and financial performance for years to come.

All of the capital cost estimates developed for compliance with the proposed standards are predicated upon the assumption that the investments can be made during 1980 and 1981, to comply with the proposed January 1, 1982 deadline for compliance. Conrail gravely doubts whether this schedule could be adhered to and the investments effected, notwithstanding the devilitating impact on the capital program discussed previously. The limitations on shop capacity, an insufficient supply of skilled labor, and potential supplier problems may be overriding constraints that would preclude compliance with the proposed standards within not only the 1980-81 period, but within a much longer time frame.

INVESTMENTS REQUIRED FOR COMPLIANCE

Muffler Installation on Locomotives
Used in Yard Switcher Service

Reason for the Investment

In its proposed noise emission standards, the EPA has recommended improved exhaust muffling and cooling fan treatment as a technique for achieving compliance with the standards. Conrail has evaluated both alternatives and determined that: (1) muffler exhaust silencers are only partially effective in reducing noise emissions from diesel locomotives and (2) there is no presently available modification that will effectively reduce cooling fan noise emissions.

Costs of Compliance

Conrail operates three categories of locomotives that are used in siwtching service:

1) Units used Exclusively in Yard Service (Less than 1,500 H.P.)

Conrail owns 788 of these locomotives. Based on estimates obtained from the Electromotive Division of General Motors Corporation, the $12,880 unit cost of retrofitting a silencer muffler on these locomotives would result in a total cost to Conrail of $10.1 million for this category of locomotive. Modifications necessary for compliance would require three days of shop work per unit, thus removing the unit from service. Since there is not a surplus of switching power, replacement locomotives would have to be leased at an estimated cost of $800 per unit per day. This would result in a locomotive replacement cost of $1.9 million for the period when modifications would occur.

2) Units Used Frequently in Yard Service (1,500 or more H.P.)

In addition to the yard locomotives exclusively assigned to yard switching service, Conrail also frequently uses 1,291 other locomotives with 1,500 or more horsepower in this service. These locomotives are assigned to particular operating regions for use in yard, local freight and industrial switching service. Since these units are physically larger than switching units and the muffler retrofit would require extensive superstructure modifications, the resultant estimated cost of modification per unit is higher, or $23,548. The total modification cost for this category of locomotive would be $30.4 million. Proposed modifications to these units are estimated to require 10 days. At $800 per day, locomotive replacement costs for out-of-service units (undergoing modifications in the shop) in this category would be $10.3 million.

3) Units Used Occasionally in Yard Service (Up to 2,800 H.P.)

Occasionally, Conrail uses higher horsepower locomotives in yard transfer and hump pushing and trimming service; 584 road freight units are used in this service. In order to maintain operating flexibility and achieve efficient locomotive utilization, but to remain in compliance with the proposed standards, these units must also be modified with muffler exhaust silencers. At a per locomotive cost of $21,918, the estimated cost of modifications to this category of locomotives would be $12.8 million. At an estimated 11 days per unit for modification, the leasing cost of locomotive replacement would be $5.1 million.

As can be seen in the cost summary, the silencer muffler retrofit on Conrail would involve 2,663 locomotives and a total investment cost of $53.3 million. The out-of-service time not addressed in the EPA Proposed Standards would require the replacement of these units during the retrofit program at a total cost of $17.3 million.

No costs have been included in these estimates to reflect increased maintenance or increased fuel consumption resulting from the muffler application. The limited experience in locomotive muffler systems does not provide information on fuel consumption. In the case of a turbocharged diesel engine, where the effectiveness of the turbocharger depends on the pressure drop from the exhaust manifold to the atmosphere, the increased back-pressure from a muffler could dramatically affect fuel consumption. The effect on a non-turbocharged model would be the same though to a lesser extent. Although no attempt can be made to quantify this effect, it is important to note that the cost can be very high; e.g., a 1 percent increase in fuel consumption would cost Conrail $2.5 million annually at current prices.

Implementation Problems

Several other problems related to muffler installations on locomotives include:

1) Replacement of Out-of-Service Locomotives

Since the proposed regulations would affect all U.S. Railroads, there would be an extreme shortage of locomotive power available for lease to replace units being modified in shops. Leasing costs presented in the previous section do not assume unusually tight market conditions for available locomotive power. It is more likely that the cost of locomotive leasing would be higher than the estimates given, if the units could be obtained at any price. If locomotives were not available for lease, Conrail would have to decrease its level of service or forego business opportunities, a scenario of potentially devastating impact.

2) Shop Capacity

Conrail has limited heavy repair facilities at its Altoona and Collinwood locomotive backshops. A practical limit of 800 heavy repair overhaul units can be produced annually in these shops. Even if all of Conrail's overhaul resources were dedicated to the silencer-muffler retrofit, it would require 3.3 years to complete the minimum number of units to meet our existing yard switching needs. It, therefore, would be physically impossible to meet a January 1, 1982 target date for compliance using only Conrail shops.

Since all U.S. Railroads would be facing the same mandate, the few contract shops capable of performing the necessary modifications would be over-subscribed, thus providing little or no extra shop capacity.

3) Muffler Supply Industry

It is questionable whether suppliers could meet the demands of all U.S. Railroads for the requisite number of mufflers and other hardware within the prescribed time frame to comply with the proposed standards.

4) Labor Supply

Skilled labor for this work load increase is presently not available. To acquire staff for a program of this magnitude would require an extensive and expensive recruitment and training program for craftsmen to man production lines. This demand for talent would be present at all railroad and vendor shops simultaneously. Based on the usual learning curve, maximum production could not be achieved during the first year (1980) of the program.

Electrical Standby Facilities/Electrical Standby Equipment for Locomotives

Reason for the Investment

The EPA recommended that idling locomotives be shut down when not in use in order to reduce noise emissions. An alternative recommendation was to relocate idling locomotives to some other location, away from yard boundaries.

Conrail has considered both of these recommendations and has determined that relocation of locomotives within our hump yards and other terminal areas is feasible neither from a practical operating standpoint nor from an economic standpoint.

Conrail, therefore, has determined that the most economical and practical way to meet the proposed EPA Noise Abatement Regulations is to shut down locomotives when they are not in use. To accomplish this, and at the same time protect the equipment and the operation, requires a significant capital investment in both fixed facilities at numerous locations and on all Conrail diesel-electric locomotives.

In view of these problems it was decided to provide electrical standby facilities to maintain the lubricating oil and cooling system of diesel locomotives at near operating temperatures when the locomotives are shut down to meet proposed EPA noise abatement standards.

Cost of Compliance

These facilities must be engineered to accept the maximum anticipated number of locomotives shut down at any one time at 389 separate locations throughout the Conrail System. As can be seen from the summary tabulation, the facilities are tailored to meet demand and the per unit cost varies as the units increase. The total capital investment for these facilities is $81.7 million.

Included in this cost is the purchase and installation of necessary transformers; switchgear; cables, complete with appropriate plugs for 3 phase, 4 wire, 220 volts, 100 amp service; and necessary underground cabling from the switchgear to convenient standby cable locations along the storage tracks.

Electrical energy and demand costs to operate the system have been assumed to equal the cost of fuel oil used to keep the same number of locomotives idling. Maintenance cost for the fixed plant facility is estimated at 5% of the investment cost or $4.8 million annually.

In addition to this cost, an operating cost of $14.1 million annually will be required. This cost results from the manpower necessary to operate the facilities, shut down locomotives, place them on standby, monitor the operation of the standby equipment, and restart the diesel engine after the standby service cable has been removed.

The electrical standby service will be required seven (7) months per year, October through April. Protection of the locomotives and facilities is required at least eight (8) hours per day seven (7) days per week during the seven (7) month period. Only those locations were included in this cost, where no mechanics are now employed during the period the locomotives would be on standby. Based on these parameters, it would require 629 additional mechanical personnel to properly man the standby facilities for eight (8) hours a day, October through April.

It is probable that more employees will be needed because at some locations locomotives are shut down for periods in excess of eight (8) hours per day. If two hours of duty at each location are necessary the force must be increased to 951 employees and the annual labor cost including fringe benefits will be $21.8 million.

By labor agreement, operating crews cannot be required to place locomotives on standby; they do not possess the expertise to start a locomotive that has been shut down for an extended period. After such a period, it is necessary to open cylinder test cocks and blow condensate out of the combustion chambers. This is done by cranking the engine with the starting circuit while the test cocks are open. After the engine has been thus cleared, the test cocks are closed and the engine started in the normal manner. Mechanics, either machinists or electricians, possess the tooling and expertise necessary to perform this task.

In order to take advantage of these facilities all Conrail locomotives would be equipped with the proper apparatus to convert the electrical energy provided by the standby cable to heat that will maintain the liquids in the diesel engine at operating temperature.

This apparatus includes electrical heating elements in the cooling water system; electrically driven water and lubricating oil pump to circulate the heated water and oil; electrical space heaters to maintain operating cab temperatures above freezing; electric strip heaters to keep the battery box above freezing; and an electrical trickle charger to maintain the battery voltage during shutdown.

Based on EMD estimates this on-board apparatus, with a maximum electrical demand of 25 kw, will cost $5,307 per unit. 4,138 locomotives would require this treatment by January 1, 1982. Therefore, the total investment cost of this project would be $22.2 million. It is estimated that maintenance costs on this equipment would be 5% annually or $4.8 million.

It would be possible to accomplish the retrofitting of these units at the same time the silencer-muffler project was being done. However, there are 1,520 units not included in that program which would require the electrical standby apparatus. It is estimated that three (3) days

would be required to modify the units; Conrail would require replacement units for this loss in availability. The lease cost of $800 per locomotive per day will result in an approximate total cost of $3.7 million for the project.

From the standpoint of physical staging, the electrical apparatus would be programmed along with the installation of the silencer-mufflers on 2,663 locomotives. It should be noted, however, that there are 1,520 units not included in that program which would also require the installation of electrical standby apparatus. These additional units would require shopping for at least three

(3) days each to accomplish the necessary work. The out-of-service time, therefore, would require the leasing of replacement units to maintain service levels at a daily rate of $800 per locomotive, which results in additional costs of $3.6 million during the period of installation.

The electrical standby investment operation and maintenance costs are in 1979 dollars. Inflation will continue to escalate labor costs, material costs, and depending on the relative costs of energy could result in a net increase in energy costs. Therefore, these estimates are conservative and can only get larger.

Implementation Problems

1) Maintenance Impact

No attempt has been made to quantify additional maintenance costs incurred as a result of repeated continual shutdowns. Data on the additional long and short-term maintenance costs of these repeated shutdowns are not available; however, it is widely acknowledged that the net result of such an operating policy would be to shorten the service lives of the units.

2) Other Constraints

As in the case of the silencer-muffler, the overriding constraints of facility capacity, skilled manpower, lack of replacement power (to replace units undergoing retrofit), and possible material shortages, would render compliance by January 1, 1982, virtually impossible. In fact, based on Conrail's present and planned shop capacity, the additional electrical standby retrofit requirements would take more than five (5) years to complete - three (3) full years beyond the proposed cutoff for compliance.

Sound Proof Load Test Cells

Reason for the Investment

Conrail checks the performance of its diesel-electric locomotives under full load conditions at least once each year, as necessary, to ensure that locomotives are performing at full potential. This testing is done by placing an electrical load on the main traction generator/alternator and operating under load for several hours so that all systems are brought into operation under simulated road operation. By necessity, all 20 load test cells across the system are located at Conrail locomotive maintenance terminals, which are generally near population centers. In order to meet the proposed standards, it would be necessary to enclose these cells in soundproof buildings.

Costs of Compliance

The estimates shown on the cost summary tabulation are based on buildings of sufficient size (120' long x 30' wide x 24' high) to accommodate the largest locomotive (70' long) in the Conrail fleet. The buildings would require adequate ventilation, lighting, heating, and sufficient accoustical treatment to ensure that a locomotive undergoing a load test will not produce a noise emission in violation of the proposed standards.

As shown on the cost summary, the estimated cost for a load test cell ranges from $710,000 under normal conditions, to as high as $750,000 where pilings are required. Since it is assumed that half of the load test cells would require pilings, the total capital investment for these facilities would be $14.6 million.

An annual maintenance cost is also shown in the Cost Summary at the rate of 5 per cent of the initial investment or $700,000 per year. The Cost Summary does not include additional costs to operate these facilities; the cost of utilities for each of the enclosed buildings will, however, be a significant additional recurring cost.

Implementation Problems

As in the case of the silencer-muffler and the standby electrical system, Conrail's ability to construct these load test buildings would depend on contractors and the level of building activity in the particular area involved.

considering the engineering time, the filing of environmental impact studies and other legal requirements prior to construction, it is extremely doubtful that many of these structures would be completed, or even progressed, by January 1, 1982.

Mechanical Refrigerator Cars

Conrail's ownership of mechanical refrigerator cars is modest and therefore, would not account for a significant investment to meet the proposed standards for refrigerator car mufflers. It must be noted, however, that by virtue of Conrail's 23.5 per cent interest in the Fruit Growers Express (FGE), a company which owns and operates 2100 mechanical refrigerator cars, a substantial portion of the cost would eventually be borne by Conrail. While the cost to retrofit these cars for compliance with the proposed standard is estimated at $500 per car (in excess of $1 million for FGE's fleet) the cost to Conrail has not been quantified and does not appear in the Cost Summary.

Modified Retarders with Concrete Slabs and Oil Spray Sound Barriers with Concrete Footings

Reason for the Investment

Retarders are designed to remove energy (i.e. reduce speed) from free rolling cars in a hump yard. The operation of these retarders emits a squealing noise that results from contact between the retarder brake shoes and the car wheels. The EPA's proposed standards suggest three means for reducing retarder squeal:

(1) Lubrication of retarders;
(2) Installation of sound barriers;
(3) Use of ductile iron brake shoes on retarders.

Conrail's experience with ductile iron brake shoes has been unfavorable. For this reason, they have not been proposed for use on Conrail.

Although Conrail personnel have doubts regarding the effectiveness of lubrication of retarders and/or the use of barriers to reduce yard noise, these two treatments have been used as the basis for cost estimates to reduce retarder squeal.

When oil is applied to retarders (to reduce noise levels) their energy removing capabilities are reduced. Additional retarder capacity would be required to restore the energy removing capability to its original level. Concrete slabs (or "basins") would be required to provide for proper collection and disposal of the used oil. In conjunction with this effort, noise barriers would be constructed at master and group retarders in the hump yards.

Cost of Compliance

Conrail has 18 hump yards that would require modifications for compliance discussed in this section. The estimated construction cost of the modified retarders with concrete slabs and oil spray is $42.7 million, construction of sound barriers with concrete footings would cost an additional $5.0 million. Note that the costs cited are solely for construction; they do not include any estimates for out-of-service costs (which would be substantial) or additional annual recurring costs of maintenance or operations attributable to these modifications.

Footnotes:
Muffler Installations

a) Locomotive catagories reflect all locomotives assigned to switching service including units assigned exclusively (less than 1,500 HP), frequently or occasionally (1,500 HP or greater); the latter two categories include units assigned to a specific region for yard, local or industrial switching service, and units assigned to a system pool which are utilized to augment regional switching power.

b) The cost to retrofit higher horsepower units rises sharply due to more extensive superstructure modifications and higher capacity mufflers.

c) Material and installation costs to retrofit the projected fleet are based on data from Electromotive Division, GMC. The figures do not reflect the costs associated with projected locomotive acquisitions during 1981 (90 units) since it is assumed that acceptable mufflers will be incorporated into the design and purchase price; the added cost of acquisition has not been determined. Costs also do not include engine cooling fan modifications, since the state of the art has not yet developed a feasible "silent" fan.

d) Out of service cost reflects current rental fees to replace units undergoing modification; replacement units would be required to maintain service levels.

Electrical Standby Facilities and Apparatus

e) Electrical standby facilities would be required to restart the maximum number of "cold" shutdown locomotives at 389 locations across the System; each of these sites supports at least one tour of duty per day. Due to the high viscosity of locomotive oil, a cold diesel engine can only be restarted at ambient temperatures of 50 degrees Fahrenheit or greater.

f) Permanent electrical standby facilities on the ground would be equipped with 220 volt three-phase four-wire cable with appropriate plugs located at convenient intervals along locomotive storage tracks; these costs include complete ground installation, electric service, transformers, switch-gear, outlets, and cables.

g) Electrical standby facilities would require the employment of approximately 629 additional mechanical personnel (per Conrail's labor agreements) to operate the system; the annual labor costs associated with operating this system during the frost period from October to April could range from $14.1 million to $21.8 million, depending on the number of tours of duty.

h) Locomotives would be equipped with electrical heating apparatus, as follows: circulating water pump to maintain proper radiator fluid temperature; lubricating oil heater; electrical spare heater to maintain cab temperature; electrical strip heater in battery box; and small trickle charger to maintain specific gravity level for battery charge.

Mechanical Refrigerator Cars

i) The direct cost to install mufflers in mechanical refrigerator cars (RPL's) is not expected to be significant due to the relatively few cars in Conrail's fleet. However, by virtue of Conrail owning 23.5% interest in Fruit Growers Express (FGE) it is anticipated that a significant share of the costs to retrofit FGE's fleet of about 2,100 RPL's would eventually be borne by Conrail.

Yard Modifications

j) The installation of modified master, intermediate and group retarders requires the construction of concrete slabs to provide for the proper collection and disposal of oil. The figures do not reflect the severe curtailment of yard activities which will result from both the construction of these facilities and the curing of concrete. This is especially critical when the master retarder is removed from service, since it is the principal retarder over which all traffic in the yard is classified.

k) Considerable yard grading and redesign would be required at six classification yards (Enola; Morrisville, Stanley, Allentown, Cedar Hill, and Rutherford) to limit humping speed to 4 MPH; the proposed regulation erroneously assumes that a 4 MPH guideline has been universally adopted by the industry.

l) Other yard modifications include costs associated with hump and fan redesign, catenary changes, communication and signal changes, and the replacement of inert retarders with releasable substitutes.

Yard Grading and Redesign

Reason for Investment

Extensive grading at 6 classification yards would be required to reduce car speeds to a maximum of 4 miles per hour. These modifications would reduce grades at these locations to no more than .08 percent, the grade that allows a maximum speed of 4 miles per hour.

Cost of Compliance

Conrail has estimated that the cost of constructing these modifications would be $27.3 million; these costs are understated since they only reduce yard grades to 0.12 percent, rather than the .08 percent required to assure a maximum humping speed of 4 miles per hour.

Implementation Problems

The implementation problems associated with yard grading and redesign are similar to those discussed in the section on retarders and sound barriers.

Other Yard Modifications

Reason for the Investment

This category includes the following:

1) Replace inert retarders with releasable type. Inert retarders are generally located at the end of classification tracks, and are used to hold cars as they are being classified. This is required to prevent cars from free rolling to the point of switch (i.e. the departure yard). As cars are pulled from the classification tracks, a high pitch "screeching" sound occurs, so that the duration of this sound is considerably longer than that of the hump retarders. Releasable type retarders, when activated, will allow cars to pass freely, thus eliminating the noise caused by inert retarders.

2) Hump and Fan Modification. In order to provide sufficient space for the extended hump retarders and sound barrier walls, a complete redesign of the hump and fan (the area between the hump crest and classification tracks) would be required. This includes the relocation and extension of rail at 13 classification yards. The redesign of the hump and fan would necessitate a reduction in the number of group tracks (i.e. those leading to the classification tracks), and result in less efficient humping operations.

3) Catenary modifications, drainage, structure modification and miscellaneous charges required to effect modifications in 1) and 2).

Cost of Compliance

An investment of $22.4 million would be required to eliminate noise from inert retarders. This does not include an as yet undetermined cost associated with maintenance of releasable retarders. Hump and fan modifications, including communications and signal (C&S) equipment relocation would cost $13.4 million. Catenary changes, etc. would cost an estimated $3 million.

Implementation Problems

The implementation problems associated with other yard modifications are similar to those discussed in the section on retarders and sound barriers.

IV. STANDARDS

Subpart A (Definitions)

There is no definition for "best available technology." (BAT). The following definition is offered by Conrail:

> "Best available technology means the best proven technology currently known and available in the railroad industry."

The following letters refer to respectively lettered sections in Subpart A:

(n) There should be no provision for a day-night distinction as comments suggest below.

(r) "Component sounds" definition is without value unless, technologically, there is sufficient integrity in monitoring equipment to distinguish the "through train" from operating equipment.

(s) Same comment as above in (r) but distinction made would be between railroad and non-railroad noise sources.

(u) Same comment as in (n): This definition, like the standard itself is arbitrary, capricious and discriminatory by virtue of its intended application.

(ee) Same comment as in (u).

(gg) Same comment as in (u).

(hh) Same comment as in (u).

Subpart B (Interstate Rail Carrier Operations Standards).

Section 201.10(b). This receiving property standard discriminates in favor of Western railroads; the Northeast has little undeveloped land by EPA's definition. Also, the Northeast offers much less of an opportunity to purchase additional land around yards to serve as buffer zones.

EPA has identified some seventeen pieces of maintenance of way equipment. However, EPA has not clearly identified the noise levels coming from any of these individual pieces or combinations of equipment. EPA has stated on the one hand that it is not establishing a specific aggregate noise limit on yard equipment; yet on the other hand it imposes this standard which would not distinguish among noise sources.

EPA should offer a range of noise limitations to account for non-railroad noise contributions or at least, offer a variance procedure whereby petitioners can make a showing on a case-by-case basis of non-railroad noise contributions.

Section 201.15. The car coupling standard calling for a maximum 4 mph car speed is a Conrail goal to prevent freight damage. However, from a practical standpoint extensive experience has obliged Conrail to permit a range between 3.9 and 4.9 mph: maintenance of an exact 4 mph top speed is operationally infeasible without significant cost (see Page 17).

Conrail knows of no BAT or durable cushioning material to attenuate noise impact levels from coupling. The cost associated with meeting this standard with non-durable material would be excessive.

Again, EPA should consider a range of numbers or guidelines where BAT has not been firmly established. Additionally, EPA should consider providing for a procedure allowing a variance from receiving property and point source limitations. The variance should be based upon petitioner's technological or economic showing of fundamentally different factors impeding the use of BAT.

Section 201.17. The imposition of a day-night standard for railroads would restrict all rail operations. See Appendix I. Compliance with the night time limit would effectively disrupt Conrail's activities at many flat switching and industrial train yards. These disruptions would in many cases result in operational delays and an unfavorable reputation as a reliable carrier.

Additionally, the nightly shutdown and morning startup of diesel locomotives would damage many engines: Contraction of the piston casing caused by cooling would permit water to enter the cylinders. See Pages 2 and 3.

EPA has not documented a need for the more restrictive L_{dn} standard of 10 db intended to ameliorate the intrusive impact of noise. The alleged interruption of sleep of residents living adjacent to railroad facilities serving, in part, as a need for these regulations, is as arbitrary and spurious a premise as that which suggests most residents sleep soundly by virtue of the large number of adjacent dwellings. The unfounded assumption of railroad-caused insomnia should not be the rationale for using the L_{eg} (1) or L_{dn} requirements. EPA has not correlated the added 10db restriction with health; this day-night restriction offers no substantial gain to the Nation's welfare.

The L_{dn} standard is highly discriminatory. There is no L_{dn} standard being imposed on any other mode of transportation. EPA has not carefully considered costs relating to loss of business and jobs or the additional cars needed for the daytime car cycle. During 1978, for example, Conrail moved over 4.95 million carloads and trailers containing perishables and non-perishables; the vast majority of this freight must meet a schedule requiring daily movement over a 24-hour period. If hump yards close down from 11:00 PM until 7:00 AM, Conrail predicts that within one week's time, disruptions caused by physical obstruction would result in a regional system shutdown. (See Appendix I). It clearly is safe to say that there would be no service at all or decreased service and increased costs arising from a more stringent night time standard. These impacts have been grossly understated or overlooked by EPA.

EPA's casual reference to curtailment of night time activities cannot be dismissed without pointing to a number of serious business and operational implications, both within and outside of the rail industry, including:

- Less efficient utilization of fixed plant and equipment, which would translate into operating problems, competitive disadvantages, etc.; operating and service deterioration would quickly lead to a diversion of traffic and revenues to other modes.

- Disruptive effect of not providing continuous support to heavy industry that operates on an around-the-clock basis. In addition to its impact on the rail industry, such restrictions would also result in less efficient utilization of industrial facilities, with a resultant rippling effect throughout the economy.

> Inability to provide early morning staging activity in support of day time operations. This would seriously impair Conrails's ability to meet service commitments, e.g. intermodal loadings and service to major eastern perishable markets.

Decreased service arising from a more restrictive night time standard flies in the face of Congressional intent. Congress expressed its "policy" in Section 2(b) of the Act (See Page 2) but it expressed specific intent when it set aside funds for Conrail to assist it in increasing revenues from rail service.

These regulations should have spoken to some distinctions among noise sources. The EPA proposal, for example, fails to provide for non-railroad noises audible in and around yards viz: overhead aircraft, adjacent highways, scrap yards, foundries, forges, construction, trash compacting trucks, and subway or elevated trains may add to railroad yard noises. Road trains themselves, day and night, make loud coupling noises as they set off or pick up; wheels squeal around curves; cars rattle as they adjust to the slack; dynamic brake systems whine as they are applied to multiple unit locomotive consists; and longer trains beat out a familiar click as they pass over frogs and joints. The receiving property standard also fails to distinguish noise from 24 hour operations at factories, mills, mines and waterfronts.

Again, EPA should provide procedurally for a railroad to petition EPA for a variance from this standard where it can show economic or technological infeasibility, physical impossibility or no exposed population.

Subpart C (Measurement Criteria for Specific Noise Sources).

As a general comment, Conrail submits that EPA's measurement criteria does not account for a wide variety of combined effects. Instrument accuracy tolerances, reflecting noise off of objects near the source, competing noise sources, ground surface contours and various weather conditions have an effect on noise measurement accuracy. Conrail believes that EPA should consider these contingencies in their measurement methodology.

Subpart D (Measurement Criteria for Receiving Property)

EPA's measurement methodology in this subpart fails to consider that noise dominance can change hourly; there is no commonality of railroad sites as a consequence of variations in property lines and yard activities; and noise measurements do not always record the noise from an identifiable source.

As mentioned earlier, there are several non-railroad noise sources which contribute to the receiving property noise levels. Measurement methodology must ensure monitoring of railroad noise exclusively; this standard fails to the extent that non-railroad noises may be recorded by monitoring equipment. Monitoring equipment should be positioned some distance from any background object which is likely to reflect and register both the direct and reflected sound waves.

July 25, 1978

Hollis G. Duensing, Esq.
Association of American Railroads
Law Department
American Railroads Bldg.
Washington, D.C.

Dear Mr. Duensing:

This refers to your letter of July 5th, requesting certain questionnaire information concerning classification yards and a narrative discussion relative to industrial yards.

The questionnaire is attached. It indicates conclusively that any restriction on classification activity could not be absorbed at the same or other yards.

As mentioned at our meeting in Washington, Conrail employs yard crews at 338 locations. 175 of these have 3rd trick crews regularly assigned. 15 of these are major yards significantly oriented towards classifying cars beyond their immediate retail serving territory. In other words, at approximately 160 of the locations where we work crews on the 11 P.M. to 7 A.M. shift, the prime purpose is to directly accomodate customer rail service requirements.

The continuous operation of the railroad including yard switching operations has existed ever since the headlight was invented, i.e. almost from the beginning. The general pattern of industrial growth and hours of plant operation followed the growth of the 24 hour railroad network. The basic service structure was (and still is in large degree) for today's loads to be pulled and forwarded tonight. (Your category 1) Tomorrow's raw material is placed in the early A.M. - perhaps just after arrival. (Your category 2)

To feed production, large rail oriented industries working two shifts require almost continuous switching service. Those that work around the clock do so absolutely. Some industries such as produce terminals are early morning operations themselves. Others require car placement during the night to provide work for casual labor such as meat-cutters or warehouse labor. This force is engaged day by day on the premise that specific cars will be available tomorrow. This force will be paid for nothing if the cars are not available to unload. The traditional evening release - early AM placement has returned to particular vogue with the advent and growth of the piggyback trade. The entire service pattern of this major rail business segment is based upon evening loading and dispatch coupled with early morning arrival and unloading. The alternative is the truck traveling thru the night.

Examples of industries depending absolutely upon night time rail service are several:

Automobile assembly plants - evening and early morning inbound rail cars area sine qua non of keeping the production line from going down. Alternative premium transportation is possible as a short term stop gap only. I attach typical switching schedules for two auto related facilities with which I am familiar, the Willow run auto loading dock, the GMAD Will Run assembly plant, the Olds main plant at Lansing (both an assembly and a parts manufacturing plant).

Steel mills - continuous operation of blast furnaces, open hearths, rolling mills,basic oxygen furnaces and the like require rail support at all times, either the road haul carrier, the plant switching road or some combination of each. Examples on Conrail are the Bethlehem Burns Harbor in plant, Great Lakes steel at Trenton, Mich Midwest steel at Portage In, and several other and even larger mills.

Produce markets - Conrail serves several major rail produce unloading market terminals notably at Baltimore, Philadelphia, Pittsburgh, New York and Boston. These markets require by trade custom and regulatory Fiat to be protected by a published early morning placement. In this connection see Page 4 of TL-CTR freight tariff 841 ICC C-1182 copy attached.

Major rail oriented industries - Many large manufacturing industries require dedicated switch engine service on a continuous basis because their plants must have an ongoing flow of loaded and empty cars to survive. I am personally familiar with the cereal mill operations at Battle Creek, where there is a committed crew working from 11:30 P.M. to 7:30 A.M., for the exclusive purpose of serving the Kellog cereal plant. This crew switches continuously thru the night between the serving yard and the Kellog complex. A similar dedicated 3rd trick crew serves the Post Division of General Foods. A like situation obtains at Mehoopany, Pa, where continuous coverage of Proctor and Gamble's Charmin paper plant is provided. These assignments are indicated on the attached Lehigh Division list of local freights. Although nominally locals, the Charmin jobs are yard engines for practical purposes, and exist to serve around the clock at the industry. Neither Battle Creek or Mehoopany is unique.

The industrial support acitivty of many yards involves making up local freight trains for daylight operation during the 11 P.M. to 7 A.M. shift. In this connection, I attach a sample portion of the local freight train schedule book showing local freight trains emanating from Rutherford and

Pavonia, with a heavy concentration of daylight departures.

Night time industrial switching activity is a necessity to serve many patrons in urban core areas where vehicular congestion precludes train operation during daylight hours. This is part of the service at several locations on Conrail, notably at Baltimore, Philadelphia, Newark and Jersey City. The prohibition against daylight switching may be by ordinance curfew or simply a practical operating matter.

At locations along the Northeast Corridor and in commuter areas, freight, local, transfer and industrial crews cannot traverse passenger main tracks except at night.

Essentially, the railroad provides warehoused inventory on wheels. This inventory must be available when either continuously for large rail transportation users or before the work day in the case of other major patrons. Those customers whose rail service requirements can be met exclusively by daylight mid-shift service are usually the smaller or less service sensitive concerns or those who use other than rail transport for most of their needs.

The consequence of interdicting night time service in whole or in part would be widely disruptive of major industry (chemical, steel, auto, paper food products, warehousing, coke, power plants ad infinitum) to the point where the nation's economy would be on its knees the day after implementation. An absurd extension of the effects would require a tripling of the customer portion of the freight car cycle:

Daylight Day 1	Place car for Day 2's use
Daylight Day 2	Unload Car
Daylight Day 3	Pull car after prior days unloading

The inflationary impact of trying to cope with a few decibels is beyond imagining. Taking the word "environment" in its widest context, shutting off the arteries of rail commerce during darkness would do nothing for the quality of human life.

Sincerely,

John B. Hitchcock
Director - Terminal Planning

cc: Mr. Daniel F. Donovan
Commerce Counsel - 1138

Mr. E.T. Harley
Director - Operations Technology - 950

PRELIMINARY

SUMMARY OF ESTIMATED COSTS TO MODIFY EQUIPMENT, FACILITIES, AND HUMP YARDS IN ORDER TO COMPLY WITH E.P.A. PROPOSED NOISE ABATEMENT REGULATIONS

(1979 Dollars)

	Count	Average Unit Cost	Total Capital Cost ($ Millions)	Out of Service Days/Unit	Out of Service Cost/Unit	Out of Service Total Cost ($ Millions)	Annual Recurring Costs ($ Millions) Maintenance	Annual Recurring Costs ($ Millions) Operations
. Muffler Installation on Locomotives Used in Yard Switcher Service:(a)								
Exclusively	788 locomotives	$12,880	$ 10.1	3	$800	$ 1.9		
Frequently	1291	23,548(b)	30.4	10		10.3	MINIMAL	
Occasionally	584	21,918	12.8	11		5.1		
	2663		$ 53.3(c)			$ 17.3(d)		
. Electrical Standby Facilities – Capacity to Handle:								
1-2 units	189 locations	$ 78,000	$ 14.7					
3-4 units	79	150,000	11.9					
5-9 units	58	290,000	16.8					
10-15 units	31	350,000	10.9					
Over 15 units	32	856,250	27.4					
	389(e)		$ 81.7(f)				$ 4.8	$14.1(g)
. Electrical Standby Equipment for Locomotives:	4183 locomotives	$ 5,307	$ 22.2(h)	3	$650	$ 3.0(h)	$ 4.8	-
. Sound-Proof Load Test Cells:								
Not requiring pile foundations	10 facilities	$710,000	$ 7.1	-	-	-		-
Requiring pile foundation	10	750,000	7.5					
			$ 14.6				$ .7	
Sub-Total Locomotive Related Noise Abatement			$171.8			$20.3	$10.3	$14.1
. Mechanical Refrigerator Cars(i)								
. Modified Retarders With Concrete Slabs and Oil Spray	18 yards	-	$42.7(j)			TO		
. Sound Barriers with Concrete Footings	18	-	$ 5.0			BE		
. Yard Grading and Redesign	6	-	$27.3(k)			DETERMINED		
. Other Yard Modifications	17	-	$39.1(l)					
Sub-Total Hump Yard Related Noise Abatement			$114.1					
TOTAL			$285.9					
. Engineering @ 10% and Contingencies and Staging @ 20%		-	$ 85.8					
GRAND TOTAL			$371.7			$20.3	$10.3	$14.1

(ACCOMPANYING FOOTNOTES ARE A[illegible]RAL PART OF THIS DOCUMENT)

SUMMARY SHEET
ESTIMATED COST TO INSTALL NOISE ABATEMENT BARRIERS
AT VARIOUS CONRAIL YARDS PER EPA. GUIDELINES
PART I

KEY	YARD	MASTER				INTERMEDIATE			
		NO	EXIST. LENGTH	ROOM FOR 20% EXT	SPACE FOR SOUND BAR.	NO	EXIST LENGTH	ROOM FOR 20% EXT.	SPACE FOR SOUND BAR
1.	PAVONIA N.J.	1	128.3	36.64' YES	YES	—	—	—	—
2.	ENOLA PA.	1	78.25	EB 16.75	YES	3	1) 78.25 2) 72.00	EB 16.75	YES NO
		1	116.	WB 16.75	YES	3	78.15	W.B. 16.75	1) YES 2) NO
3.	MORRISVILLE PA.	1	72.0	16.32 YES	YES	2	144	32.06 YES	YES
4.	CONWAY PA.	2	62.5	12.5 NO	YES	2	62.5	12.75 NO	NO
		2	125.25	25.07 NO	YES	2	62.75	12.75 NO	NO
5.	STANLEY OHIO	1	121	27.5 YES	YES	3	32.5	11.0 NO	NO
6.	ALLENTOWN PA.	1	90	12.75 NO	YES	—	—	—	—
7	OAK ISLAND N.J.	1	92	22.0 YES	YES	3	50.5	11.0 YES	YES
8.	CEDAR HILL CONN.	1	72	10.75 YES	YES	3	72	18.75 YES	YES
9.	FRONTIER N.Y.	1	137.5	27.5 YES	YES	—	—	—	—
10.	SELKIRK N.Y.	2	214.5	44.0 YES	YES	—	—	—	—
11.	DEWITT N.Y.	1	148	33.0 NO	YES	—	—	—	—
12.	BUCKEYE OHIO	1	176	30.5 YES	YES	—	—	—	—
13.	RUTHERFORD PA.	1	99	EB 44 YES	YES	—	—	—	—
		1	68.5	WB 11 YES					
14.	ELKHART IN.	1	198	44 NO	YES	—	—	—	—
15.	SHARONVILLE OHIO	2	137.5	31.25 YES	YES	—	—	—	—
16.	AVON ILL.	1	192.5	30.5 YES	YES	—	—	—	—
17.	DETROIT	1	110.5	27.5 YES	YES	—	—	—	—
18.	BISON N.Y.	2	202.5	40' YES	YES	—	—	—	—
Totals	TOTAL								

* INCLUDES - DRAINAGE, RELOCATION OF UTILITIES, AIR LINES ETC.

OFFICE OF CHIEF ENGINEER DESIGN & CONSTRUCTION
PHILADELPHIA, PA. MAY 17, 1979

SUMMARY SHEET

ESTIMATED COST TO INSTALL NOISE ABATEMENT BARRIERS AT VARIOUS CONRAIL YARDS PER E.P.A. GUIDELINES

PART II

KEY	GROUP NO	GROUP EXIST LENGTH	GROUP ROOM FOR 20% EXT	GROUP SPACE FOR SOUND PAR.	BODY TRK GRADE EXIST	BODY TRK GRADE PLAN	PILES FOR RETARDER SUB	REMARKS
1.	4	32.1	9.16 2) NO 2) YES	2) NO 2) YES			30' LG	
2.	6 6	[illegible] [illegible]	E.B 10.75 NO W.B [illegible] NO	NO NO	E.B .20% W.B. .20%	.12%	——	REGRADE
3.	5	72.0	18.37 YES	YES	.22%	.12%	30' LG	REGRADE
4.	8 10	72.25 66.5	12.75 NO 18.75 NO	YES YES	E.B. W.B. .15%		50' LG	
5.	7	77	16.5 NO	NO	.27%	.12%	50' LG	REGRADE
6.	4	90	18.75 NO	YES	.23%	.12%	——	REGRADE
7.	5	92	22.0 YES	YES	.10%		50' LG	REGRADE [illegible]
8.	8	72	10.75 YES	NO	.22%	.12%	50' LG	REGRADE
9.	7	115.5	27.5 NO	NO	.17%		50' LG	
10.	3 4	99 115.5	22.0 27.5 NO	YES	.08%		50' LG	
11.	6	93.2	22.0 YES	YES	.08%		30' LG	
12.	4	88	22.0 YES	YES	.08%		——	
13.	6 6	99 99	22.0 YES 22.0 YES	YES YES	.20%	.12%	——	REGRADE
14.	2 6	99 115.5	22.0 27.5 NO	YES	.15%		——	
15.	5	118.75	25.0 YES	YES	YES		50' LG	
16.	6	92.5	22.0 YES	YES	.12%		50' LG	
17.	[illegible]	[illegible]	[illegible]	NO			50' LG	
18.	[illegible]	[illegible]	[illegible]	[illegible]	.10%		50' LG	
Totals								

SUMMARY SHEET

ESTIMATED COST TO INSTALL NOISE ABATEMENT BARRIERS
AT VARIOUS CONRAIL YARDS PER E.P.A. GUIDELINES

PART III

KEY	[illegible] RETARDERS	CONCRETE SLABS	ADD 20% RETARDATION	SOUND BARRIER	OIL SPRAY	YARD GRADING	HUMP & FAN MODIFICATION
1.	15,400	286,400	192,000	63,600	335,000	—	403,800
2.	77,200	777,100	1,586,000	340,800	1,540,000	8,788,500	1447,000
3.	58,200	[illegible]	456,000	263,000	536,000	2,211,700	449,400
4.	[illegible]	1,832,400	2,366,000	508,800	2,144,000	—	2,357,200
5.	[illegible]	[illegible]	957,000	102,700	737,000	3,452,900	842,800
6.	[illegible]	[illegible]	390,000	156 000	335,000	4,587,500	365,000
7.	[illegible]	[illegible]	604,000	251,700	603,000	—	—
8.	[illegible]	[illegible]	536,000	125,600	804,000	2,911,400	681,700
9.	[illegible]	[illegible]	820,000	200,500	536,000	—	697,700
10.	[illegible]	1,478,200	961,000	217,500	603,000		44,900
11.	95,700	769,100	642,000	245,900	469,000	—	10,000
12.	[illegible]	417,000	485,000	151,100	335,000	—	—
13.	[illegible]	[illegible]	[illegible]	261,500	[illegible]	[illegible]	650,000
14.	[illegible]	554,500	548,000	365,500	[illegible]	—	32,400
15.	[illegible]	905,100	760,000	242,200	469,000	—	—
16.	[illegible]	[illegible]	[illegible]	267,500	[illegible]	—	—
17.	[illegible]	[illegible]	[illegible]	224,600	400,000	—	[illegible]
18.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	—
Totals	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

SUMMARY SHEET

ESTIMATED COST TO INSTALL NOISE ABATEMENT BARRIERS AT VARIOUS CONRAIL YARDS PER E.P.A. GUIDELINES

PART III

KEY	CATENARY	STRUCTURE MODIFICATION	C & S HUMP & FAN	MISC. *	REPLACE INERT RET.
1.	—	—	80,000	—	—
2.	677,000		620,000	346,000	2,146,100
3.	85,800	—	205,000	123,500	—
4.	—	977,300	1,010,000	—	3,295,400
5.	—	—	430,000	94,500	1,249,000
6.	—	—	150,000	280,400	—
7.	—	—	—	—	—
8.	—	—	440,000	75,000	—
9.	—	—	365,000	—	1,850,100
10.	—	—	115,000	1,800	2,068,400
11.	—	600,000	10,000	30,000	1,179,500
12.	—	—	—	—	1,179,100
13.	—	—	510,000	—	1,537,900
14.	—	—	15,000	—	2,125,000
15.	—	—	—	—	1,179,500
16.	—	—	—	—	2,137,700
17.	—	—	220,000	—	945,400
18.	—	—	—	—	1,468,400
Totals	762,800	1,577,300	4,170,000	951,200	22,368,500

SUMMARY SHEET

ESTIMATED COST TO INSTALL NOISE ABATEMENT BARRIERS
AT VARIOUS CONRAIL YARDS PER E.P.A. GUIDELINES

PART V

KEY	SUB TOTAL	ENGINEERING 10% ±	CONTINGENCIES & STAGING 20% ±	TOTAL EST. COST	REMARKS
1.	1,376,200	137,600	302,800	1,816,600	
2.	18,145,700	1,814,600	3,992,100	23,952,400	
3.	5,199,100	519,900	1,143,800	6,862,800	
4.	14,624,000	1,462,500	3,217,500	19,304,000	
5.	8,539,600	854,000	1,878,700	11,272,300	
6.	6,641,500	664,200	1,461,200	8,766,900	
7.	2,465,200	246,500	542,400	3,254,100	
8.	7,014,900	701,500	1,543,300	9,259,700	
9.	5,272,000	527,200	1,15[illegible],800	6,95[illegible],000	
10.	5,781,100	578,100	1,271,800	7,631,000	
11.	4,071,200	407,100	895,700	5,374,000	
12.	2,620,900	262,900	578,400	3,470,200	
13.	10,155,900	1,015,600	2,234,300	13,405,600	
14.	4,955,500	495,600	1,090,200	6,541,300	
15.	3,619,800	362,000	796,400	4,778,200	
16.	4,570,100	457,000	1,[illegible]05,400	[illegible]	
17.	4,051,400	405,100	[illegible]	[illegible]	
18.	4,401,100	442,100	[illegible]	[illegible]	
Totals	113,534,000	11,353,500	24,977,700	149,865,200	

DELAWARE AND HUDSON RAILWAY COMPANY

ALBANY, NEW YORK 12207

Dependable Transportation Since 1823

KENT P. SHOEMAKER
President and Chief Executive Officer

May 23, 1979

79-01-056

Rail Carrier Docket Number ONAC 79-01
Office of Noise Abatement and Control
(ANR-490)
U.S. Environmental Protection Agency
Washington, D.C. 20460

RE: NOISE EMISSION STANDARDS FOR TRANSPORTATION EQUIPMENT; <u>INTERSTATE RAIL CARRIERS (40 C.F.R. PART 201)</u>

Gentlemen:

I refer to the proposed regulations covering the above captioned subject matter which were published in the Federal Register on April 17, 1979 (44 FR 22960) and to the solicitation of public comments which accompanied the same.

By virtue of the Regional Rail Reorganization Act of 1973 (Rail Act), the bulk of major railroad properties in the Northeast were conveyed to a single operator, i.e., Consolidated Rail Corporation (Conrail) on April 1, 1976. Since that date, and with substantial infusion of Federal grant monies, Conrail has since operated those previously diverse railroad properties as a single system. Accompanying its creation of Conrail, however, the Rail Act mandated the retention and promotion of rail competition in the region. The geographical facts of life, however, are such that the only major rail competitors in the Northeast are extremely large, Federal-grant-subsidized Conrail and relatively small, non-Federal-grant-subsidized Delaware and Hudson Railway Company (D&H). The financial facts of life are summarized by D&H's 1978 ordinary loss of $11,667,000 and by its first quarter 1979 ordinary loss of $2,278,000.

It is the intention of the Association of American Railroads to submit comments upon the proposed regulations in behalf of the entire railroad industry. The juxtaposition, however, of its financial position on the one hand and its statutorily competitive responsibilities on the other imposes upon D&H an obligation to submit the following supplemental observations.

I

Relocation of Noise Source Activities

It has been suggested that perhaps noise source activities could be moved closer to the centers of yards. This suggestion, however, ignores the fact that certain yard facilities are sufficiently narrow so that such a move would be ineffectual. At Plattsburgh, and Fort Edward, New York, for example, geography or yard width is such that D&H switching operations must take place adjacent to receiving properties, and at Rouses Point and Green Island, New York they are located in the middle of the village. This suggestion also ignores the fact that railroad facilities exist in specific sizes and configurations for specific reasons. A given yard may be quite wide by virtue of the fact that it contains 40 or 50 parallel tracks. However, by definition, that particular yard contains all those tracks, including those tracks closest to receiving property lines, because of the railroad company's need to operate upon them.

Relocation of noise source activities from noise sensitive zones would cause prodigious economic dislocations. Examples lie in the facts that 70% to 90% of the traffic handled by D&H's Kenwood Yard in Albany, New York is directed to or from the adjacent Port of Albany; that at Colonie, New York there are extensive classification tracks and yard storage tracks for cars directed to or from nearby major General Electric, Grand Union, and Ford Motor Company facilities, as well as both locomotive and car shops. At Hudson Falls - Glens Falls, noise is attributable to the fact that there is a grade at that location. Reduction of noise by reducing the number of cars per switching move would mean more switching moves and consequently more expense. At Plattsburgh, New York, relocation would be impossible, as the yard's only function is to serve local industries. Relocation of facilities at Rouses Point would be impossible without physically operating in Canada, which D&H has no right to do. Overall, while there could conceivably be locations where D&H could relocate certain facilities, new and relocated locomotive facilities alone, would range in cost from $2,500,000 to $14,000,000.

Rescheduling Nighttime Activities

The rescheduling of certain activities to times other than between 10:00 P.M. and 7:00 A.M. also presents formidable problems. One cannot ignore the fundamental fact that railroading is a 24 hour-a-day activity. At North Albany, Green Island, and Fort Edward, New York, nighttime operations are dictated by the requirements of the industries served at those points. As for Rouses Point, a Canadian National train arrives daily at 2:00 P.M. and D&H crews must work into the night to switch the cars from those trains onto D&H southbound trains. At Colonie, railroad activity continues around the clock. Such activity, however, could not be curtailed without causing Kenwood Yard to operate around the clock - something that it does not do at present. Engine idling, which is a round the clock source of rail noise, is a result of the fact that diesel locomotives cannot be shut down during cold weather.

Replacing Noisy Equipment and Equipment Modification

In time, quieter locomotives may become available. However, given the 15 to 30 year life of existing locomotives, replacement is not a short run viable solution. As to the improvement of exhaust muffling, D&H is faced with the fact that almost all of its locomotives are turbocharged. At present, it is technologically grossly impractical to affix a muffler to a turbocharged locomotive which is anything less than the approximate size of a flatcar. Anything smaller would choke the exhaust. As for cooling fan modification, to date none has been offered by locomotive manufacturers. As for engine shielding, such is currently the fact on D&H locomotives.

Enclosing or Relocating Repair Facilities

A building constructed for the purpose of load testing locomotives, complete with a single track, a suitable exhaust system, and silencing equipment would cost in the neighborhood of $900,000. It is unfortunately not practical to expect a rail carrier which lost $11,667,000 in 1978 to undertake such an expense.

Extension of Property Line

The suggestion that noise received by receiving property could be alleviated by extending the railroad's property lines raises several significant problems. The first, of course, is that land costs money - a fact which, unfortunately, is not lost upon D&H. Secondly, the acquisition of land requires a willing seller and therefore, finances aside, the extension-of-property-line option is not exclusively under the railroad's control. Thirdly, to the extent that such land acquisition could or could not be accomplished by the right of eminent domain, the exercise of such a right would unsettle the very persons whom the proposed regulations are intended to accommodate. Fourthly, many of D&H's yard facilities are incapable of land expansion. Kenwood Yard, in Albany, is surrounded by an arterial highway, the Port of Albany, and Conrail; Colonie Yard is bounded by city streets on the east, Watervliet Arsenal on the north, a steel mill and city streets on the west, and an empty lot on the south which is just north of a cemetery; Hudson Falls facilities are built up on four sides; and Plattsburgh Yard is hemmed in by city streets and Lake Champlain. Lastly, this suggestion also contains an element of inconsistency in that receiving property, by definition, is built-up area. Any land available for expansion, in all likelihood, would not be built-up area and would therefore not be subject to the regulations in any event.

II

D&H's financial situation, as highlighted by its 1978 ordinary loss of $11,667,000 undoubtedly suggests a certain lack of enthusiasm on its part to the extent that promulgation of the proposed regulations would involve the expenditure of its funds.

It has been suggested that a recent 7% rate increase granted to the railroad industry by the Interstate Commerce Commission would ease the financial impact of the proposed regulations. In D&H's case, the effect of that increase was to increase D&H's revenues for the pro forma year ending June 30, 1978 by $6,300,000. However, this rate increase accomplished merely the reduction of D&H's deficit for the pro forma year ending June 30, 1978 from $18,000,000 to $11,700,000.

It has also been suggested that the $91,000,000 estimated cost to the railroad industry to comply with the proposed regulations is modest in comparison to the $28,000,000,000 net invested by the industry in 1977. D&H suggests that such a comparison is as deceiving as it is beguiling. The fact that the Penn Central, Erie Lackawanna, Reading, Rock Island, and Milwaukee railroads, for example, had millions, if not billions, of dollars worth of equipment and fixed assets did not prevent them from going into reorganization. A railroad, or any other business, depends, for its ultimate survival and profit, upon the generation of operating revenues reasonably in excess of operating expenses. It cannot rely, for its survival, upon the value and potential sale of the very properties which enable it to generate revenue.

Much of the railroad industry is on extremely shaky financial ground. In the course of its promulgation of regulations, as mandated by the court, to cover railroad properties in addition to locomotives and rail cars, EPA is respectfully urged to remember that the American public, including that portion living adjacent to railroad yards, has a vital interest in the survival and ultimate profitability of that industry. Accordingly, it is further respectfully urged that the regulations to be promulgated impose a minimum financial impact upon the industry in general and upon D&H in particular.

May 23, 1979

Five additional copies of these comments are enclosed herewith.

Very truly yours,

Kent P. Shoemaker

Kent P. Shoemaker
President and Chief Executive Officer

CC: Harry J. Breithaupt, Jr., Esq.
Vice President and General Counsel
Association of American Railroads

RECORD OF COMMUNICATION	[x] PHONE CALL (Calvin) [ ] DISCUSSION [ ] FIELD TRIP [ ] CONFERENCE [ ] OTHER (SPECIFY)

(Record of item checked above)

	FROM:	DATE / TIME
Docket No. (ANR-490) ONAC-79-01	Robert C. Rose	DATE 6/15/79 TIME 11:50 a.m.

SUBJECT

Status of Proposed Regulations - Railroad Yards

SUMMARY OF COMMUNICATION

Mr. John Hume, Florida East Coast Railway, called and requested information as to the extension for comment date, expected date the final rule would take effect and an estimate on when we might publish a final rule.

I told him that the comment date was now July 2, 1979 (received in Washington D.C. Noise Office); that the effective dates in the proposed rule were 1982 & 1985 depending upon the standard involved; and that I could give him no realistic date at this time when the final rule would be published, as it presently depends on a number of independent factors.

His call was prompted by the fact that the railroad is attempting now in court to get the City of Ft. Lauderdale to enforce their present local rule as to the noise from their (FECR) TOFC ramp. It seems that the city is trying to get the railroad to abate noise beyond what is required in the present local ordinance and the railroad wants to hold them to it.

CONCLUSIONS, ACTION TAKEN OR REQUIRED

Per his request I have sent to Mr. Hume a copy of the proposed regulations (railyards) background document.

Mr. Humes Telephone No. is 904-829-3426

INFORMATION COPIES

H McGrory

ANR-490

79 15:26

EPA Form 1300-6 (7-72) REPLACES EPA HQ FORM 5300-3 WHICH MAY BE USED UNTIL SUPPLY IS EXHAUSTED.

ONAC-79-01-060

Ford Motor Company

One Parklane Boulevard
Parklane Towers East, Suite 200
Dearborn, Michigan 48126

June 29, 1979

79-01-161

Rail Carrier Docket Number ONAC 79-01
Office of Noise Abatement and Control (ANR-490)
U.S. Environmental Protection Agency
Washington, D. C. 20460

The following is a public comment submission in response to the U.S. Environmental Protection Agency Notice of Proposed Rulemaking, FR Doc. 79-11707, under 40 CFR 201, pertaining to "Noise Emission Standards for Transportation Equipment Interstate Rail Carriers". These comments are submitted on behalf of Ford Motor Company by Mr. A. C. Adams, Manager, Transportation Analysis and Procurement, Transportation and Traffic Office, Purchasing and Supply Staff.

Ford Motor Company is opposed to the level of noise emission standards contained in the subject EPA proposed rulemaking on the basis that the proposed standards would impose additional burdens on railroad operating costs and railroad operating performance above and beyond the level necessary to protect the public interest and the environment. Ford supports the position taken by the American Association of Railroads that the specific noise level standards should be revised using a more practical and less theoretical methodology to reflect realistic conditions and to avoid setting the standards at a level higher than actually is needed, or at a level that is not cost justified vs. the public interest.

Further, Ford believes the "cost of compliance" evaluation by the EPA is underestimated, and does not reflect the true potential for railroad price increases to be passed on to shippers in order to pay for the compliance programs. Ford believes the proposed standards would have the effect of making railroad yard operations slower and more costly, and further contribute to the deterioration of railroad service that Ford has experienced in recent years.

79-01-135

Rail Carrier Docket Number ONAC 79-01 June 29, 1979

Ford Motor Company presently ships the majority of its freight by rail, and has been for many years one of the world's largest rail shippers. As such, Ford has a strong interest in seeing the railroads continue as a viable transportation mode. Unfortunately, the prospect for the continued viability of railroads is neither certain nor guaranteed, and in fact is questionable. As a large user of railroad services Ford has experienced a continuing trend of major deterioration in railroad service and significant loss of competitive railroad pricing in recent years.

This is neither a secret nor a surprise to anyone reading these comments since it is widely recognized that the present condition of railroad service in the United States constitutes a national problem. Based upon its many years of railroad shipping experience, Ford believes part of the railroad problem is due to unnecessarily cumbersome government regulations and antiquated labor agreements that deny railroads the opportunity to become operationally efficient and cost competitive.

In summary, Ford supports the position that specific noise level standards can be established that are acceptable to the American Association of Railroads and that minimize the cost burden to the railroads while satisfying the protection of public interests. We suggest that the standards in the present proposed rulemaking be reviewed and revised to accommodate a more cost effective solution and to better comply with Executive Order 12044 of March, 1978, wherein cost justification and economic impact are to be considered in all rulemaking.

Very truly yours,

A. C. Adams, Manager
Transportation Analysis and Procurement

GENERAL ELECTRIC
COMPANY
2901 EAST LAKE ROAD, ERIE, PENNSYLVANIA 16531

C. J. SCHLEMMER
VICE PRESIDENT AND GENERAL MANAGER
TRANSPORTATION SYSTEMS BUSINESS DIVISION

May 30, 1979

Mr. Henry E. Thomas
Director
Standards and Regulations Division
United States Environmental Protection Agency
Office of Air, Noise and Radiation
Washington, D.C. 20460

Dear Mr. Thomas:

Thank you for your April 13 letter and the opportunity to comment on the proposed revision and expansion of Federal noise regulations applicable to railroads.

Our Division employs approximately 8,000 people and about two-thirds of these jobs are totally dependent on orders we receive from railroads for locomotives. Based on our own estimates, the cost to the railroad industry in complying with the proposed regulations would be far in excess of the EPA estimates. Any significant additional financial burden on the railroads in regulation compliance will adversely affect all of their other capital programs, including the purchase of locomotives.

Because of the heavy dependence of this plant and this community on the locomotive business, we strongly recommend an easing of the proposed regulations to drastically reduce the cost of compliance.

Very truly yours,

Carl J. Schlemmer

bjs

Illinois
Central
Gulf

An IC Industries Company

Illinois Central
Gulf Railroad
Two Illinois Center
233 North Michigan Avenue
Chicago, IL 60601
(312) 565 1600

June 26, 1979

Rail Carrier Docket #ONAC79-01
Office of Noise Abatement & Control
(ANR-490)
U.S. Environmental Protection Agency
Washington, D.C. 20460

SUBJECT: COMMENTS ON PROPOSED EPA NOISE EMISSION STANDARDS FOR TRANSPORTATION EQUIPMENT-INTERSTATE RAIL CARRIERS

79-01-132

Gentlemen:

We have compiled the following comments concerning the proposed rail noise emission standards which were published in the April 17, 1979 Federal Register.

The impact upon ICG operations and cost which the relocation of locomotives would have is extremely difficult to quantify. For example, in certain very small yards in rural areas, locomotive relocation at the facility may mean relocation 300 feet further along the track. If free field conditions exist, the noise impact upon the receiver may change very little. Moreover, in many cases the effects of such a change may be to expose another receiver to higher noise levels. In larger facilities this reasoning may also apply. Also, the existence of dedicated tracks for fueling, switching, etc., would preclude the relocation of locomotives on them.

In some cases significant increases in crew costs would occur by the above change. If crews have to arrange for special transportation to get to the locomotives at the new locations, this would be reflected as a higher cost associated with operating trains. Also, union agreements may limit the extent to which crews could reasonably be expected to travel to access the locomotive.

-SARD ANR-490
2 JUL 79 5:29

If relocation of fueling facilities away from the property line is considered as a means of noise reduction, the costs to achieve this become prohibitively high. Our standard design for new fueling stations include a concrete collection pad, grit chamber, oil-water separator, sampling station and scavenged oil tank. Based on whether an installation requires one, two or three spot fueling, the material and construction costs are approximately $47,000, $71,000 and $97,000, respectively. We have approximately 70 locations where locomotives are refueled and if even half of these would have to be moved in order to relocate locomotives away from property lines, the costs become ridiculously high.

We currently have two facilities on ICG which house engines for load cell testing. Our Paducah, KY facility is designed to hold the engine only in an enclosed room for load cell testing. Its cost was approximately $300,000.

At Woodcrest Shop near Chicago we have a load cell test building in which the entire locomotive is parked for load cell testing. Its cost was approximately $200,000. Some operating problems exist with this building with respect to proper air circulation. In our opinion, special buildings to house locomotives undergoing load cell testing are not cost effective noise control measures. If buildings were required at each facility where load cell testing is done to reduce noise emissions, the cost to ICG would be in excess of $3,500,000. A large part of the cost of these buildings is due to elaborate ventilation systems required to keep the locomotive from choking itself off and overheating in exhaust emissions.

After consulting with our Operating Department we determined that we are unable to come up with a unique definition of switch engine for noise compliance purposes. Their response was: "Any of our locomotive fleet could be subject to switching cars at any given time or circumstance and therefore I do not believe it would be feasible or practical to attempt to establish such a unique definition . . ."

The EPA's definition of "through trains" will apply to very few ICG trains inasmuch as long haul, inter-city freights make stops for either crew changes, fuel, locomotive changes or a combination of these. A definition needs to be sufficiently broad to include these possibilities.

We currently have approximately 45 retarders on ICG which could require the installation of noise barriers. Preliminary estimates indicate that properly designed barriers would cost the ICG over $7,000,000 systemwide.

In the last paragraph on page 22962 the EPA is specifically asking for comments concerning possible financial impacts and the feasibility of moving from a 70-dB to a 65-dB standard for hump yards. I think the EPA should perform a detailed cost benefit analysis to show the effect of these standards.

On page 22966, middle column, the EPA solicited comments concerning the cross-elasticities of railroad and truck transportation. Certainly for ICG the demand for rail transportation is of a highly elastic nature. Many commodities shipped by rail could be lost to trucks if service deteriorated significantly or if we priced ourselves out of the transportation market. The ability to remain competitive rests primarily on the railroad's ability to invest in plant equipment which can produce a return. A dollar spent on noise barriers contributes nothing to ICG's market share, whereas a dollar spent on grade track or rolling stock does.

We appreciate the opportunity to comment on these proposed regulations.

Yours very truly,

M. J. McKinney

M. J. McKinney
Environmental Engineer

KBMT
BEAUMONT

June 14, 197[illegible]

Mr. William Roper
Environmental Protection Agency
ANR 490
Docket No. 790-1
Washington D.C.

79-01-112

Dear Mr. Roper,

Hope it's not to late to officially comment on the expanded noise emission regulations for railroads because I feel a couple of things should be included that are not....

If you will please refer to the attached letter to the Missouri Pacific area Superintendent, you will see that I am having a personal problem with railroad noise, but it is not covered in your proposea regulations.

Your new rules apply to "railroad yards". MP is not switching in a yard. They are using a single spur siding in a heavily populated residential area. This is also happening in other parts of this city, and from what I have been told, in many other cities because of the increased volume of rail business; their switchyards are simply not big enough anymore, so they have moved into the subdivisions....

Also, you do not cover whistle noise. The MP uses their whistles to signal their employees who are actually coupling the cars as to when they are going to move forward, or reverse, etc...As you know, these devices were designed to serve as a warning, and were designed to: 1. be loud to carry a long distance, 2. be annoying so they will be noticed.....Imagine them at 3 a.m. as you try to sleep....

These are expensive homes, and some of them are within 100 feet of the tracks. The situation is really unbearable, and MP is very un-cooperative.. Hope you can help...

Would appreciate your reply.

Regards,

Bill

Bill Huston
Mgr. News and Public Affairs

25 JUN 79 11:53
RECD ANR-490

KBMT
BEAUMONT

April 9, 1979

Mr. Kenneth Milam
Superintendent
Missouri Pacific Railroad
501 Crawford, R. 313
Houston Texas

Dear Mr. Milam,

It is with frustration that I write this letter to you on the residential switching problem on the Elizabeth siding that we have discussed before. I have attempted to reach you by long distance phone twice, and left messages for you, but I have had no response.

As you already know, I strongly feel that Missouri Pacific has no right to utilize this siding, at the expense of the domestic tranquility of me and my neighborhood, for the purpose of switching and blocking railroad cars... This is a siding, and not a switchyard, and it was never used for that purpose until about a year-and a half ago.

After personal contact around six months ago, you told me the switching operations would be moved to the west end of the siding--not because of my protests, but because you had a longer run of track there, with fewer street crossings. You made good on your word. Since then, most of the activity has been at the other end, albeit much to the chagrin of folks living near there....

But, a couple of weeks ago, that changed....THE TRAINS ARE AGAIN BACK ON THE EAST END...My question is, "Why?"

Don't know what you have heard from the folks on the west end of the siding, but I cannot sit idly by and have both my sleep, and peace of mind, disturbed. Would appreciate a response from you so that I may know what to expect...

Sincerely,

Bill Huston

Bill Huston

cc: Mayor Maury Meyers
Beaumont City Council
Congressman Jack Brooks
Senator Tower
Senator Bentsen
E.P.A.

KBMT-TV Channel 12, P.O. Box 1550, Studios 525 IH-10 South, Beaumont, Texas 77704, (713) 833-7512

National Railroad Passenger Corporation 400 North Capitol Street N.W. Washington, D.C. 20001 Telephone (202) 383-3000

Amtrak

July 2, 1979

Environmental Protection Agency
Office of Noise Abatement and Control
401 M Street, S.W.
Washington, D.C. 20460

Re: Docket No. ONAC 79-01
Noise Emission Standards for Railroad
Facility Operations

Dear Sir:

I am enclosing five copies of the statement of the National Railroad Passenger Corporation (Amtrak) in response to the notice in Docket No. ONAC 79-01, which appeared in the Federal Register on Tuesday, April 17, 1979.

An extra copy of this cover letter, and a self-addressed stamped envelope, are enclosed. Please return the extra copy to indicate receipt of this filing.

Sincerely yours,

Frederick C. Ohly

Frederick C. Ohly
Assistant General Counsel

cc: H. Duensing, AAR

RAHD APR-490

2 JUL 79 6:16

1013

STATEMENT OF

NATIONAL RAILROAD PASSENGER CORPORATION (AMTRAK)

CONCERNING

NOISE EMISSION STANDARDS FOR RAILROAD FACILITY OPERATIONS

BEFORE

THE

ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF NOISE ABATEMENT AND CONTROL

DOCKET NO. ONAC 79-01

Frederick C. Ohly, Esq.
Assistant General Counsel
National Railroad Passenger Corporation
400 North Capitol Street, N.W.
Washington, D.C. 20001

Date: July 2, 1979

Statement of
National Railroad Passenger Corporation (Amtrak)
Concerning
Noise Emission Standards for Railroad Facility Operations
Before the
Environmental Protection Agency
Office of Noise Abatement and Control
Docket No. ONAC 79-01

The Environmental Protection Agency (EPA) published a notice in the Federal Register of Tuesday, April 17, 1979, setting forth proposed rules which would expand the applicable Federal regulations governing permissible noise emissions from railroad operations. The National Railroad Passenger Corporation (Amtrak) has reviewed the regulations proposed by the EPA, and has consulted with the Association of American Railroads (AAR) with respect to the impact which the proposed regulations would have on Amtrak and the rest of the railroad industry. The concerns of the AAR and most of its member railroads are somewhat broader than those of Amtrak in this proceeding, and the AAR's treatment of many aspects of the proposed regulations will be considerably more detailed than the treatment which Amtrak will separately offer.

Amtrak endorses the position and comments of the AAR in this proceeding. In addition, Amtrak wishes to comment independently with respect to the basic approach which EPA has proposed for establishing controls on permissible noise impacts from the operation of railroad facilities. Amtrak will also comment on the impact of a few provisions of the proposed regulations which appear to be of particular concern to Amtrak's passenger operations.

Proposed Railroad Facility Noise Impact Standards.

Section 201.17 of the proposed regulations would establish a standard of Ldn 70 decibels (dB) as the maximum permissible noise impact on developed property from the operation of railroad facilities. This standard represents a 24-hour averaging of total sound from a facility, but it includes a differential or adjustment in the measurement of noise for a period of nine hours at night which adds ten decibels to the noise levels actually experienced during such period. The purpose of the nighttime differential is to encourage, if not require, the reduction of noise levels during nighttime hours primarily in order to permit people to sleep with minimal disturbance in areas adjacent to railroad facilities. In addition to the 24-hour Ldn standard, Section 201.17 would establish Leq standards of 84 dB for daytime operations and 74 dB for nighttime operations. These standards set the maximum permissible noise impact for any one-hour period.

The Proposed Requirements Are Unreasonable, and Should Be Modified.

Amtrak feels the Leq standards would require the elimination of the most significant adverse noise impacts without imposing unreasonable compliance burdens on operating railroads in most situations. The proposed Ldn standard, however, is unreasonably stringent and would apply with unnecessary breadth. While it may serve as an admirable goal, it is unrealistic as a legal requirement.

The process of measuring noise impacts on all developed properties adjacent to a railroad facility for a 24-hour period as required by the Ldn standard would be very complicated and expensive. The use of sophisticated equipment by properly trained personnel which would be required to perform the extensive measurements required in order to determine compliance with the proposed Ldn standard would probably cost somewhere in the range of $50,000 at a medium size facility. It would be far more expensive at large facilities. Because this measuring process would need to be performed at virtually all facilities simply in order to determine compliance, Amtrak does not know whether any of its facilities currently comply with the proposed Ldn standard. As a result, Amtrak is unable to calculate or predict with any precision the costs which would be required in order to comply with the proposed regulations. Because of the scope and strictness of the Ldn standard, however, Amtrak believes that such costs would be very high and that the collective benefit to adjacent properties (and their users) would be unreasonably small in relation to such costs.

It is likely that Amtrak's existing operations at many of its major facilities would fail to meet the EPA's proposed Ldn standard primarily because of the severe handicap which it would place on nighttime operations in all developed areas. It appears, therefore, that this proposed standard could not be complied with unless Amtrak were to make fundamental changes in the size of its equipment fleet, the location of its yards, the nature of the service it provides, the way in which it conducts its operations, or a combination of all of these. The cost and service impacts of such changes would be tremendous, and are not necessary. Amtrak believes that the fundamental purpose of the proposed regulations can be attained by 1) adopting more reasonable standards which would eliminate the most offensive noise impacts, 2) realistically limiting the scope of the regulations to provide special nighttime protection only to existing residential uses, and 3) providing a reasonable process for obtaining exemptions in those specific situations where it can be demonstrated that the costs or other burdens of compliance with the standards specified in the regulations are not warranted by the benefits which can reasonably be anticipated from such compliance. The EPA can eliminate the unnecessary breadth contained in its proposed regulations without seriously compromising the goals it properly seeks to achieve.

Importance of Nighttime Railroad Yard Operations.

In attempting to average for a twenty-four period and establish a sharp differential between permissible noise from day and night operations, it appears that the EPA has either overlooked the basic nature of most railroad operations, or has lost sight of the relationship between the controls it is proposing and the environmental improvement which it is attempting to achieve. Most railroad yards currently operate around-the-clock. This represents the most efficient utilization of available corporate resources. In addition, in most cases, it reflects the absolute necessity of servicing equipment and making up trains during nighttime hours in order to keep available equipment in operation and provide regular service to its customers by originating trains throughut the day. The consequences of eliminating or substantially reducing nighttime operations in rail yards could be disastrous for both passenger and freight railroad operations.

The servicing of equipment and make up of trains require operation of switch engines which produce a significant amount of noise. Servicing of equipment also can involve some operation of noisy machinery. If these operations were not permitted or had to be substantially curtailed during nighttime hours, many railroad locomotives and cars would be required to sit idle for approximately one-third of each day, unless they could be scheduled to be in operation in regular commercial service during nighttime hours. While Amtrak does have many overnight trains, it is not in a position to schedule additional nighttime passenger trains in order that its equipment fleet would be operated at maximum utilization during that period of each day. Amtrak's equipment fleet is extremely limited, and Amtrak does not have enough passenger cars to satisfy the demand which currently exists for its service. Amtrak schedules its trains as effectively as possible to meet the market demands of its customers, and must use the remaining time when such equipment is not in operation to perform necessary servicing and maintenance. Amtrak (and the American public) cannot afford any reduction in the utilization of its equipment due to increases in servicing or idle time. Reduced utilization translates directly into a reduction in the level of service which Amtrak is capable of providing.

Many of Amtrak's trains originate in the early morning hours. If yard operations were significantly reduced by noise constraints during nighttime hours, such trains would have to be made up the day before (with servicing and maintenance, of course, being performed sometime before that). Such trains would then have to be stored overnight. Even if Amtrak had a large supply of equipment which would allow for such a well-ordered operation, most existing railroad facilities used by Amtrak do not have the capacity to store a significant number of assembled trains for any period of time. Particularly in large cities, room does not exist for significant expansion of existing facilities.

Stricter Nighttime Standards Should Only Apply to Existing Residential Uses

In spite of the importance of nighttime yard operations to railroads, Amtrak does understand the potential benefit of a nighttime noise differential in protecting adjacent residential property, where serious noise impacts can be disruptive to occupants attempting to sleep. Some special protection of this interest would appear to be warranted. There does not, however, appear to be any rational basis for providing the same type of special nighttime protection for non-residential properties.

Most developed, non-residential property which is adjacent to railroad yards is used for commercial or industrial purposes. Such properties do not require a different level of protection against noise impacts during daytime and nighttime hours. In fact, since most commercial and industrial facilities are unlikely to operate during nighttime hours, there would normally be even less need for protection of such facilities at night. For those facilities which are operated during nighttime hours, however, the nature of their operations and the impact of noise thereon can be expected to remain reasonably constant throughout the day and night. There may be a few exceptional non-residential activities located near railroad facilities which would be adversely affected by nighttime noise. Amtrak is unable, however, to think of any significant examples of such properties or activities. It would be extremely inappropriate for government to establish a broad regulatory requirement for the minimal benefit which might be conferred upon these unidentified activities. Thus, if there is to be a nighttime differential, it should only apply to impacts on existing residential users.

New Development Which Would Generate Non-Compliance Should Be Prohibited

The regulations should prevent development of properties adjacent to railroad facilities for any uses which the EPA determines warrant special protection because they are deemed to be particularly sensitive to noise emissions. Such restriction on future development could take the form of a complete prohibition against any construction of a facility on a receiving property which would be subject to excessive noise impacts (as determined by the regulations) from operations at an existing railroad facility. In lieu of such an absolute restriction, the regulations could permit development of adjacent properties if special construction techniques were applied which would satisfactorily reduce the noise impacts experienced within such new buildings. Such construction is now widely employed near airports and other high noise sources.

There may appear to be a jurisdictional problem in the EPA attempting to regulate local land use in the manner proposed by Amtrak. However, the failure of EPA to adopt (or require localities to adopt) such restrictions would create a substantial and unreasonable interference with interstate commerce. As proposed, the regulations would permit owners of property adjacent to a railroad facility to develop such land without regard to the noise impacts of railroad operations on it, even though such development would then create a legal obligation on the part of the railroad to incur major burdens to modify its facilities, change its operations, or even attempt to completely relocate its facility. As a practical matter, it would often be cheaper for a railroad to acquire such adjacent property, even at inflated prices, rather than to implement costly changes to its facilities or operations. In short, adjacent land owners would be in a position to blackmail operating railroads. It is one thing to provide a reasonable measure of protection for existing uses in conformity with new standards of social welfare. It is, however, totally unreasonable to either 1) permit further development which will be undesirably impacted by noise emissions generated by an existing railroad operation which was being operated in an acceptable fashion before the new development, or 2) require such operation to be further limited in order to protect the new use.

The Ldn Standards Are Inconsistent with Existing Locomotive Standards.

The standards for railroad facility operations which the EPA has proposed in this proceeding appear to be inconsistent with the locomotive noise standards contained in the EPA regulations adopted in 1975. Those regulations, which establish maximum noise limits for new locomotives manufactured beginning in 1980, were apparently the product of more careful thought and extensive study than has been possible in the current rulemaking proceeding. Those standards are 70 dB (measured at a distance of 100 feet) while idling, and 87 dB while operating in the first through the eighth notch. The noise from idling and operating locomotives is normally the largest source of noise generated by a passenger railroad facility. Even if they complied with the EPA's post-1979 manufacturing standards, several locomotives which are idled and operated for any significant amount of time, particularly during nighttime hours, could easily violate the Ldn standard established by proposed Section 201.17.

As discussed above, the switching operations involved in servicing and make up of trains must be performed throughout the day and night at many railroad yards. When road and yard diesel locomotives are not actually in service, it is unwise to shut them off for short periods and then turn them on again. The frequent heating and cooling process which results causes locomotive damage. The process of restarting the locomotives also increases operating costs. (The precise mechanical problems which warrant continuous idling of diesel locomotives unless they are out of service for long periods of time is explained in greater detail in the AAR presentation in this proceeding.) While some reductions in the amount of idling which currently occurs in railroad yard operations may be possible, this source of noise will continue to be rather substantial. Even if a railroad's entire fleet of locomotives complied with the locomotive noise emission standard applicable to new locomotives purchased after 1979, it is likely that the amounts of idling and switching required for normal yard operations at locations which are closely surrounded by developed properties would not comply with the proposed EPA standards for facility noise emissions. Of course, current locomotive fleets do not meet the higher standards applicable to 1980 locomotives, and it will be many years before the preponderance of railroad locomotive fleets do.

Need for Less Stringent Standard In Cold Weather.

Regardless of the degree to which the requirements which have been proposed by EPA are modified, Amtrak believes a differential should be incorporated in the regulations which would permit higher noise emissions from railroad facilities in colder weather (e.g. below 40 or 50 degrees). The purpose of this further differentiation among operating conditions would be to permit a greater amount of idling of diesel locomotives in cold weather, when the adverse effects of allowing of a diesel engine to cool are most critical. In addition to the greater need for continuous idling of diesel locomotives at low temperatures, it can reasonably be assumed that people in adjacent buildings are most likely to be indoors and to have their windows closed when the weather is cold. As a result, the actual disturbance caused by the noise which is generated should be somewhat less than it might be during warmer weather.

Relationship of Railroad Facility Noise to Ambient Noise Levels.

Proposed Section 201.17 provides that noise impacts on developd properties from railroad facilities need not be limited below the impact levels created by the dominant sound component from other activities in the area, even if such other noise exceeds the regulatory standards for railroad operations. While Amtrak has not undertaken the elaborate measuring which would be required, Amtrak believes that several of its yards in major metropolitan areas, such as the yard at 12th Street in Chicago, are located in areas where the ambient noise levels created by other activities (such as highways, airplane overflights, industrial activity, etc.) are generally higher than the noise limits proposed by EPA for railroad operations during many or all periods of the day. In such cases, the EPA regulations may have little or no impact on Amtrak. In other cases, however, the noise from surrounding activities may be slightly below the standard established for railroad facilities. It would be unreasonable for Amtrak (or any other railroad) to be required to make a significant effort to reduce its noise if the remaining noise generated by surrounding activities is still so high that the reduction in actual noise impacts in an area was relatively marginal. Amtrak therefore proposes that the regulations should only restrict railroad facility noise emissions to the level specified in the final regulations, or to a level which shall not exceed ambient noise levels by three decibels, whichever level is higher.

Need for Exemption Process.

Even if all of the improvements suggested by Amtrak in this rulemaking are incorporated in the final regulations, there is no reason why a railroad should be required to take expensive or burdensome actions to limit noise in a situation where the public benefit from such actions does not warrant the cost or operating burden involved. The EPA has not shown that its proposed regulations are intended to deal with a health problem. They are, instead, intended to improve the welfare of persons living and working (or otherwise present) in the vicinity of railroad facilities. The number of people benefitted and the degree to which they would be benefitted by the proposed regulations are subject to some question. There should be a reasonable balance between the burden incurred by a railroad and the benefit conferred on adjacent users. In order to ensure such a result, the regulations should provide for a process whereby a railroad can obtain full or partial exemptions from the regulations at individual locations where it is able to demonstrate that the dollar cost or operational burden of complying is large, and that the actual numbers of people benefitted and the degree to which they are benefitted would be relatively small.

Exclusion of Noise From Through Passenger Trains.

In addition to the fundamental problems with the proposed regulations which have been discussed above, there are two specific items in the proposed regulations which are of concern to passenger train operations and warrant modification of clarification. Proposed Section 201.1 (ss) defines "through trains" as trains operated on mainline roadbed through a railroad facility without stopping. Section 201.1 (cc) defines "main track" as track which is not auxiliary track, which is governed by a signal system, and on which trains are operated by timetable or train order. There is considerable ambiguity in these definitions. All of Amtrak's trains stop at local stations to handle passengers and for some en route servicing, and a few of them also operate on auxiliary tracks in certain localities. Amtrak feels that the regulations should be modified to include the operation of any scheduled passenger train in the definition of "through trains", and thereby clearly exclude the noise from such operations from the measurement of noise impacts pursuant to the regulations. Amtrak assumes that such a change in the regulations would not constitute a departure from the EPA's existing intent in this regard.

In addition to mainline rail operations, the EPA notice in this proceeding specifies that bells and whistles and maintenance-of-way equipment are not covered by its proposed regulations. Section 201.17 does not, however, contain a clear exemption or exclusion of the noise from such equipment and operations from the measurement of aggregate sound levels to determine compliance with this basic provision. The regulations should be modified to clarify the exclusion of noise from the listed sources.

CONCLUSION

The cost of complying with the proposed EPA standards would be very high. It would be comprised of three major elements -- loss of operating flexibility, physical modifications of facilities or equipment, and monitoring in order to determine whether existing or modified operations and facilities actually meet the requirements of the regulations. Since the scope of the regulations is so broad and the specific noise level standards which they would establish are so stringent, it is not possible at this time to provide a realistic projection of the amount of such compliance costs. Amtrak believes that the scope of the regulations should be limited to reflect a realistic effort to eliminate unreasonably offensive and disruptive noise impacts on activities conducted adjacent to railroad facilities. If the regulations did contain realistic standards, it might be feasible to identify with a reasonable degree of accuracy the benefits which would be derived from the resulting reductions in noise from railroad facilities.

The requirements which have been proposed by the EPA for limiting noise impacts from operation of railroad facilities are unreasonably restrictive and would apply with unnecessary breadth to all land uses surrounding railroad facilities. Amtrak believes that the regulations can protect the public welfare without imposing unreasonable burdens on operating railroads if they are revised in the following manner:

a) delete the proposed Ldn standard and retain the Leq standard;

b) only apply the nighttime differential for measuring noise impacts to existing residential properties;

c) restrict future development of land adjacent to railroad facilities to uses which are compatible with the noise generated by such facilities;

d) specify that any stricter nighttime standards would not apply when outside temperatures are below 40 degrees;

e) specify that noise from railroad facilities may exceed noise impacts created by other activities in the vicinity of a railroad facility by up to 3dB, notwithstanding the specific standards for railroad operations contained in the regulations;

f) modify the regulations to clearly provide for the exclusion of noise generated by scheduled passenger trains, whistles and bells, and maintenance-of-way equipment from the measurement of noise generated by a facility;

g) establish a process in the regulations for obtaining exemptions in individual situations where the cost or other burdens of fully complying with the regulatory standard are not warranted by the benefits which would be obtained.

Amtrak hopes that the information and suggestions set forth above will be of assistance in the development of final regulations which will ensure elimination of unreasonable noise impacts without imposing unreasonable burdens on operating railroads.

Respectfully submitted,

Frederick C. Ohly

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National Railroad Passenger Corporation
400 North Capitol Street, N.W.
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Q·IV, Incorporated
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Chattanooga, Tennessee 37402

May 4, 1979

Rail Carrier Docket Number ONAC 79-01
Office of Noise Abatement and Control (ANR-490)
U. S. Environmental Protection Agency
Washington, D. C. 20460

Gentlemen:

I've read with considerable interest your proposed NOISE EMISSION STANDARDS FOR TRANSPORTATION EQUIPMENT (Interstate Rail Carriers) and would like to offer the following in the area of control technique for retarders necessary for hump yard facilities.

Your document references specifically Ductile Iron Shoes. I strongly suggest that this terminology be revised to avoid the specific reference to ductile iron.

Experiments we have conducted with ductile iron never produced noise elimination levels sufficient to satisfy the targets of your proposal nor did a number of attempts with other materials which included high sulfur steel, leaded steel and lubricants of both petroleum and graphite bases. It was only after we combined the scientific and engineering principles recorded in Patent No. 4003451 that satisfactory results were obtained and noise could be controlled at levels which were not objectionable.

It is also our experience that no one material by itself provides all of the characteristics necessary to insure safe and economical operation of clasp type retarders, at the same time eliminating the very objectionable noise which has been attendant to these activities. Ductile Iron, for instance, does not have sufficient inherent toughness and elasticity to meet the structural design requirements placed upon the shoe in WABCO retarder Models 31, 32, 66 & 67. Nor does ductile iron possess sufficient impact strength to resist shoe breakage in those instances when a car might be pinched out of the retarder.

A number of railroads over the past three years have learned from their own experience that our LOW-NOISE shoes do provide adequate noise emission control for them to be able to meet your proposed standards and at a cost that is economically feasible. At the same time, our products usually give longer service-life than do the shoes available from other suppliers, thus making it possible for the

10 MAY 79 9:43

railroads to realize an additional bonus in the form of savings.

Enclosed is a copy of our brochure which contains additional information about our products. If you should have further questions, we'll be happy to discuss them with you.

Very truly yours,

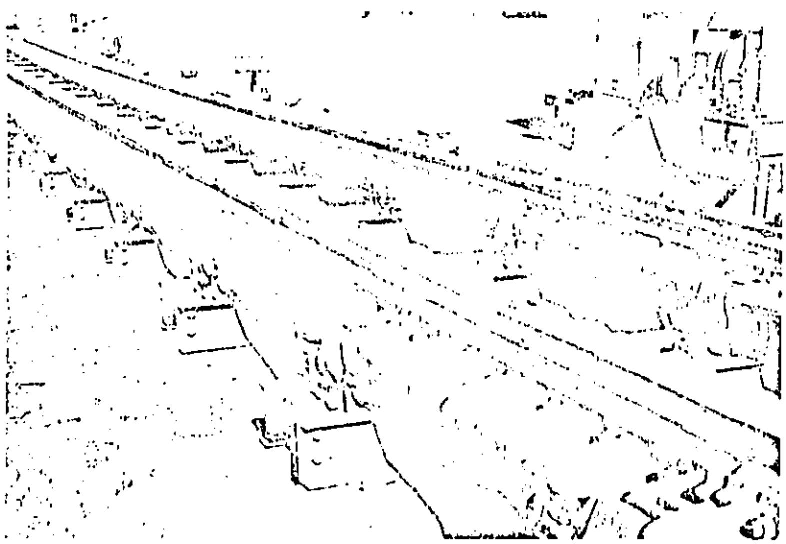
Harold F. Torok

Harold F. Torok,
President
Q-IV, Incorporated

Enc: Brochure (3 copies)

cc: Mr. Peter C. L. Conlon,
Association of American Railroads

We Can Help You...



Take the SCREECH out of your retarders

"the QUIET people"

Q·IV INCORPORATED
300 United Bank Building
Chattanooga, Tennessee 37402

1034

"the QUIET people"

Q-IV low-noise Retarder Brake Shoes are engineered to substantially reduce the screeching noise common to retarder operations in railroad freight classification yards. Noise level readings during actual hump operations seldom exceed 90 db(A) at 50 feet.

Experience gained with thousands of shoes over nearly three year's time has proven Q-IV low-noise Retarder Brake Shoes do the job under all but the most absolutely radical situations — and even then, the results are vastly improved.

Greater wear-surface-area configurations coupled with discreet choices of work-hardenable alloy materials contained in Q-IV low-noise Retarder Brake Shoes have produced results that indicate increased service life of 10-15% can be expected over retarder brake shoes of other manufacture. Longer intervals between change-outs mean savings realized.

Additional benefits are derived, too, when Q-IV low-noise Retarder Brake Shoes are installed. Their high coefficient of friction permits more energy removal from the free-rolling freight car with less "squeeze" applied by the retarder — or, for the same amount of "squeeze", the result is equivalent to lengthening the retarder by 7-10%. Thus, because less "squeeze" is required, the service life of other component parts of the retarder is increased thereby lessening overall downtime and other maintenance costs.

Our low-noise Retarder Brake Shoes are produced for Q-IV under contract by a manufacturer of international reputation for quality and service which has sufficient facilities to be able to furnish all requirements on an "immediate" or long range basis.

Q-IV low-noise Retarder Brake Shoes are priced so that their use is economically feasible — one price to all, f.o.b. Chattanooga, TN regardless of quantity. By combining requirements, thus permitting the manufacturer to operate at a regular level of production, the lowest possible price is guaranteed and availability is assured.

Q-IV low-noise Retarder Brake Shoes FIT your shoe beams. NO modifications are necessary. Each of these direct-replacement shoes is gauged during manufacture to insure no problems with bolt alignment or fit.

We'll be happy to have your order — for one unit or a full year's requirements — and if you have one of those most absolutely radical situations, we'll be anxious for the opportunity to try to help you solve it.

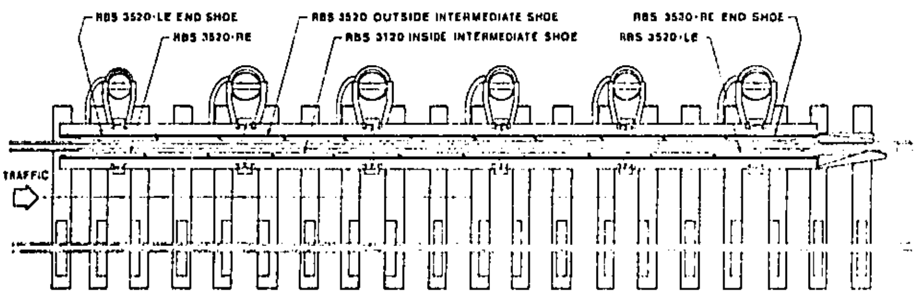
FOR BEST RESULTS

- - -

Q-IV OUTSIDE AND INSIDE SHOES SHOULD BE USED IN COMBINATION

Q-IV SHOE No.	TYPE	USE FOR	LENGTH, INCHES	WEIGHT, LBS.
RBS-1060	INSIDE, INTERMEDIATE	GRS SERIES B & E	32⅝	65
RBS-1510	OUTSIDE, INTERMEDIATE		32⅜	48
RBS-3120	INSIDE, INTERMEDIATE	U.S. & S. (WABCO) MODELS 31 32 66 67	37¼	63
RBS-3520	OUTSIDE, INTERMEDIATE		37¼	65
RBS-3520-LE	L.H. END		59⅝	90
RBS-3520-RE	R.H. END		51½	80
RBS-5010	INSIDE, INTERMEDIATE	U.S. & S. (WABCO) MODEL 50B	37¼	70
RBS-5510	OUTSIDE, INTERMEDIATE		37¼	54
RBS-5510-LE	L.H. END		24	35
RBS-5510-RE	R.H. END		24	35

FOR BEST OPERATION AND PERFORMANCE



TYPICAL Q-IV SHOE LAYOUT - US&S Co. MODELS 31, 32, 66 & 67 RETARDER

RAILROAD COMMISSION OF TEXAS

MACK WALLACE | JOHN H. POERNER, Chairman | JAMES E. (JIM) NUGENT

June 12, 1979

Rail Carrier Docket ONAC 79-01
Office of Noise Abatement and Control (ANR-490)
U. S. Environmental Protection Agency
Washington, D. C. 20460

Dear Sir:

We note a curious inconsistency in federal policies vis-a-vis the railroad industry. At the same time that the U. S. Department of Transportation is advocating rail deregulation as the government's answer to the industry's financial crisis, the U. S. Environmental Protection Agency is about to promulgate a new series of rail noise emission regulations. These regulations will, if enacted, impose another layer of technical constraints on the industry, adding an estimated $27 million in annual costs, with no corresponding benefits to improved efficiency.

79-01-100

The Railroad Commission of Texas receives each month a sizeable number of citizen complaints regarding rail operations. These complaints characteristically relate to blocked grade crossings, malfunctioning grade crossing signal devices or car shortages. Only one complaint in the past year centered around the issue of noise and this particular problem was solved to mutual satisfaction by simply bringing it to the attention of the carrier. Noise must not be a serious concern or there would be more complaints.

Removing the noise from railroads is analagous to removing the bark from dogs. It can be attempted but the results will hardly add to the usefulness of either. The only truly quiet railroads are those that have been abandoned. Adding millions of dollars in additional costs to the industry will force them to raise freight rates. Inevitably their traffic base will then decrease, raising unit costs to be apportioned among the remaining shippers. Some traffic will shift to a different mode and the railroad -- the most energy efficient and least environmentally harmful form of land transport -- will be further diminished in value.

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Tenth and Colorado • P.O. Drawer 12967 • Austin, Texas 78711

If new regulations are deemed essential by Congress, the Courts, and EPA, we suggest that the changes resulting from the 1982 emmission standards be carefully monitored so as to demonstrate an actual cost (economic and social) effectiveness prior to the imposition of even more stringent 1985 standards.

RAILROAD COMMISSION OF TEXAS

John Poerner

Chairman

James E. (Jim) Nugent

Commissioner

Mack Wallace

Commissioner

FRISCO

ST. LOUIS - SAN FRANCISCO RAILWAY COMPANY
906 Olive Street — St. Louis, Missouri 63101 — (314) 342-8400

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June 28, 1979

85875-C (Noise)

Docket Clerk
Office of Air, Noise
and Radiation
United States Environmental
Protection Agency
Washington, D. C. 20460

Re: Docket No. ONAC 79-01, Railroad Noise Emission Standards

Dear Sir:

Enclosed please find the comments of St. Louis-San Francisco Railway Company in the above-referenced docket.

Very truly yours,

Thomas H. Mug

Thomas H. Mug

THM:ko
Enclosure

79-01-157

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BEFORE THE

ENVIRONMENTAL PROTECTION AGENCY

RAILROAD NOISE EMISSION STANDARDS

DOCKET NO. ONAC 79-01

COMMENTS OF

ST. LOUIS-SAN FRANCISCO RAILWAY COMPANY

These comments are submitted on behalf of St. Louis-San Francisco Railway Company (Frisco) in the above-referenced docket.

Frisco is a major rail carrier in the Midwest with lines extending southwest to Dallas, Texas, and southeast to Pensacola, Florida. On its nine-state system, Frisco operates approximately 4,500 miles of main line trackage. 8,375 people are employed by Frisco. On an average day, Frisco operates 160 scheduled trains.

Frisco appreciates the opportunity to comment in this important docket. Frisco realizes the Congressional mandate on this subject and appreciates the burden placed upon the Environmental Protection Agency in drafting rules to meet that mandate.

PROPOSED NOISE LEVELS

After fully reviewing the railroad noise emission standards proposed by the EPA, Frisco believes that the EPA has set the standards at a level which is unnecessary to carry out the mandate of Congress. The standards are unreasonably low in that compliance at the level prescribed will be unduly expensive for the nation's rail carriers and are unnecessary to provide for the public health and welfare.

First, the EPA study as reflected in the background document does not justify the levels chosen as necessary for the health and welfare of the public. General comments pertaining to the effects of excessive noise on the public is provided. However, no discussion relating to the effects of railroad noise, or its reduction, can be found. Common experience in railroad operations has shown complaints regarding excessive noise to be the exception rather than the rule. Basically, there is no reason why a noise level of 75dB(A) or higher is not as acceptable or desirable as the 70/65dB(A) levels chosen by EPA.

It is also noted that no attempt has been made to maximize the cost/benefit ratio in this rulemaking. The Noise Control Act specifically requires the regulations to take into account the cost of compliance. Additionally, the costs estimated for the recommended abatement procedures is well above estimates provided by the EPA in the background document. Frisco would also submit that it has not been proven that any of the abatement procedures recommended will bring noise to the prescribed levels.

The use of the L_{dn} descriptor in the noise standards is an inappropriate means of measurement. This artificially lowers the noise levels prescribed below the published level. This also acts to penalize what is essentially a 24-hour per day industry. The consequences of the use of an L_{dn} descriptor are to discourage nighttime rail operations. This in turn means decreased capability of the nation's railroads. It will also decrease an already short car supply in that the number of loads each car can handle annually will be decreased. In simple terms this translates to decreased efficiency and increased costs.

NOISE CONTROL TECHNOLOGY

The EPA has identified in its rulemaking several methods of controlling railroad noise emissions. A review of these indicates that EPA has overestimated the effectiveness of the technology and has underestimated the cost involved in the proposed noise abatement methods.

a. Retarders

Studies of retarder noise on Frisco shows levels to be in excess of the average published in the background document. Installation of barriers and retarders would create an unsafe condition for signal maintenance forces. These personnel, in the performance of their duties, must work in close proximity to the retarders while they are in operation. In the event a car derails or has a shifting load, maintenance personnel must have a readily available escape route. Safe egress would be prevented by a barrier. Further, barriers would restrict routine maintenance and repair of retarder components. Certain procedures would require that barriers would be removed.

The effectiveness of noise barriers is unproven. Present technology does not include a barrier which would prevent noise emissions from the end of the barrier while allowing a freight car to pass through. Lubrication of wheels is also unsatisfactory as it would require labor redesign of the retarder system. Additional retardation would be required to overcome the loss caused by the lubrication. This means longer retarders would be necessary.

b. Mechanical Refrigerator Cars

Frisco, as the owner of 100 mechanical refrigerator cars, is keenly interested in the standards set by EPA for these cars. Frisco measurements show that the present cars do not meet the proposed noise levels.

Estimates have been obtained from several manufacturers of acoustical equipment and diesel engines to determine the cost of compliance. The present car cost is approximately $780, or seven times the EPA estimate.

c. Switch Engine Noise

As with other noise control technology, EPA has underestimated the cost for switch engine modifications. The estimates given in the background document range from $200 to $800 per switch engine. Frisco's information reveals that EMD has exhaust silencers for 1500 H.P. switches. These are increased diameter exhaust manifolds that require engine hood modifications. The present cost of a standard size new SW 1500 spark arrester manifold is $3,300. Including the cost of engine cab modifications, a silencer retrofit would exceed $4,000.

d. Other Technology

A review of the other noise control technology proposed by EPA indicates similar situations. Frisco is uncertain of its ability to control car coupling speeds at or below 4 mph in all instances.

Other difficulties are foreseen in connection with shop areas, including diesel shops. Load cell test facilities will not be able to operate as they do now. New facilities will have to be constructed at considerable expense if the efficiency level of railroad operations is to be maintained.

In some instances the railroads may be forced to purchase land surrounding their facilities in order to provide adequate buffer zones and maintain minimum operating levels. This is likely to cause unnecessary disruption of neighborhoods surrounding rail facilities.

CONCLUSION

Frisco strongly believes that the EPA has overestimated the effectiveness of certain noise control technology and has failed to truly realize the costs involved. In order to develop a realistic and comprehensive set of noise standards, it will be necessary for EPA to conduct a cost/benefit analysis in connection with any proposed noise regulations. Such an analysis is clearly required by the Noise Control Act of 1972.

At this time Frisco wishes to endorse the comments submitted by the Association of American Railroads in this docket.

Frisco strongly urges the EPA to review its proposed regulations and to set its noise standards at a level which will achieve the desired benefits without unduly burdening the nation's railroad industry.

Respectfully submitted,

Thomas H. Mug

Thomas H. Mug, Attorney
St. Louis-San Francisco Railway Company
906 Olive Street, Suite 1023
St. Louis, Missouri 63101
(314) 342-8444

Dated: June 28, 1979

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WESTPORT, CONNECTICUT 06880

18 SYLVAN ROAD SOUTH

203-226-3361

June 29, 1979

Rail Carrier Docket (ONAC 79-01)
Office of Noise Abatement and Control (AW-490)
U.S. Environmental Protection Agency
Washington, D.C. 20460

79-01-151

Gentlemen:

We have reviewed your proposed Noise Emission Standards for Rail Transportation Equipment, specifically as it relates to inert retarders in railroad hump yard installation.

We are manufacturers of a variety of railroad track devices, including our patented Trasco inert car retarder (descriptive literature enclosed).

We are pleased to note that, on page 22964 of your Proposed Rules under Standards for Specific Pieces of Equipment or Operations, you indicate that the retarder standard does not apply to inert retarders, and we concur with your observation that "Due partly to lower braking pressure, shorter retarder length, and very short duty cycle, inert retarders generally create lower noise levels and much less frequent squeals than the other type of retarders....".

We do, however, take vigorous exception to your gratuitous recommendation that releasable units be installed in all new construction and replacement applications.

In essence this alters the nature of the device, and its role in class yard operations. Even more, it introduces a variable that could, quite easily, obviate the very purpose of its installation - a retarder, left open, neither pollutes nor retards.

You are proposing a far more complicated role for a device that is primarily a safety mechanism, intended to minimize coupling and lading damage, runaway cars and, most importantly, injury to yard personnel.

Continued

5 JL 79 10:25

We strongly urge that you delete the reference to "releasable" inert retarders (a contradiction in terms) from your regulations.

Yours very truly,

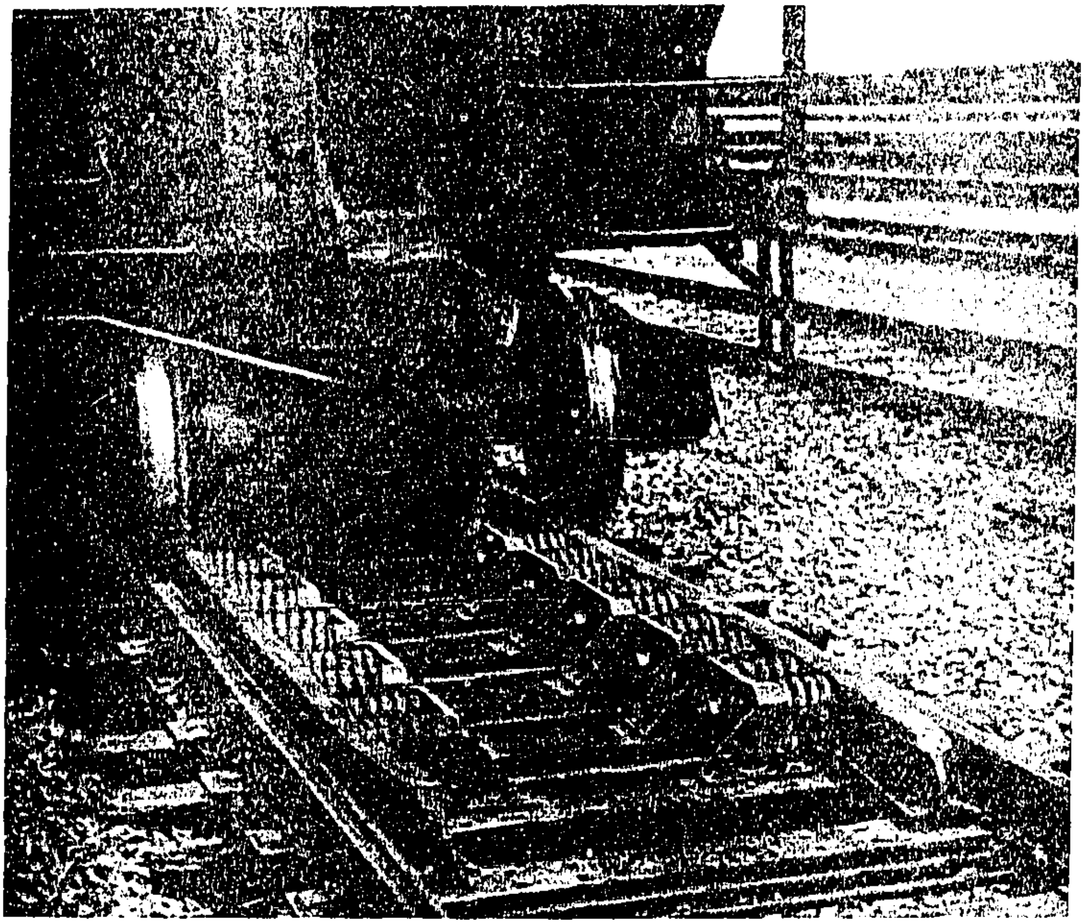
Richard E. Bodkin, President

TRACK SPECIALTIES CO., INC.

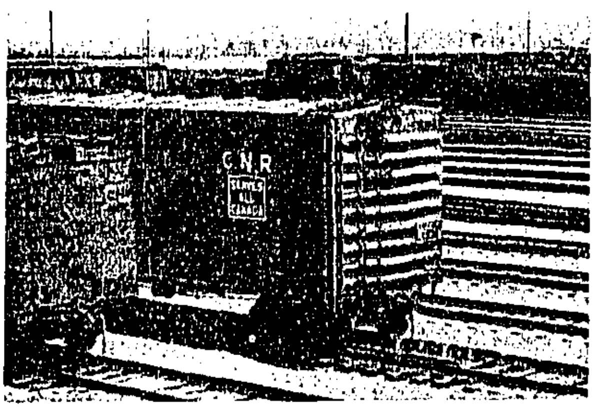
mz
Encl.

79-01-103

TRASCO



126 Trasco Car Retarders



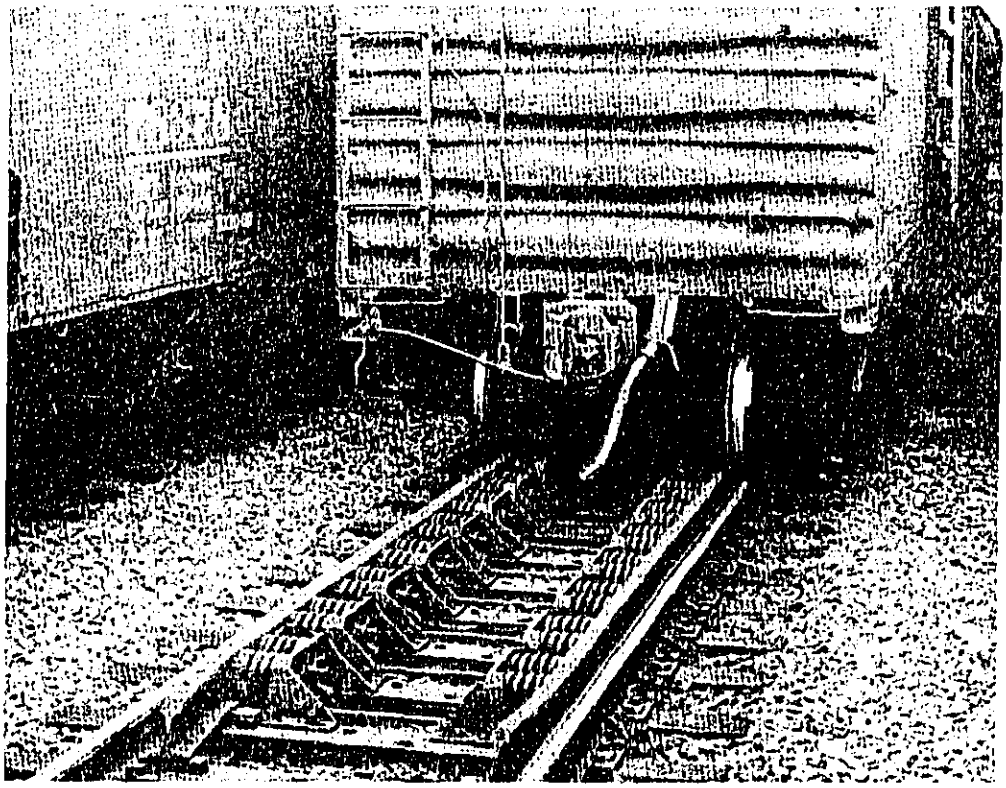
one at the end of every track, were installed by the Canadian National Railways, after comparative testing, in their new, fully automated yard at Montreal.

Then they put 36 more in their yard at Moncton.

NEW ADDRESS
P. O. BOX 729
WESTPORT, CONN.

TRACK SPECIALTIES CO., INC. General Motors ~~Building, New York 19, New York~~

TRASCO CAR RETARDERS



One of 99 TRASCO inert car retarders installed in the ConRail Rutherford class yard at Harrisburg, Pennsylvania.

AFTER 14 YEARS OF TROUBLE FREE OPERATION TRASCO AUTONOMIC CAR RETARDERS STILL ON DUTY 24 HOURS A DAY

Operating, Signaling, Maintenance of Way . . . all agree on TRASCO car retarders for all-weather dependability; simplicity of design and operation; economy of installation and maintenance.

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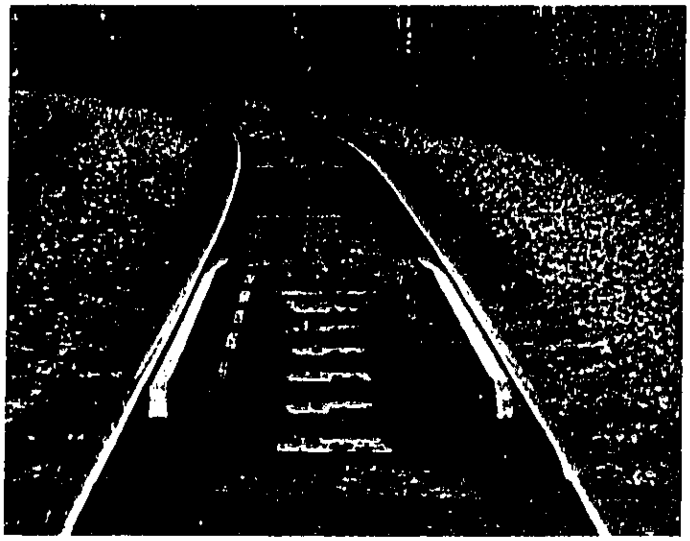
WESTPORT, CONNECTICUT 06880   203-226-3361

63 YEARS OF RAILROAD SERVICE

TRASCO CAR RETARDERS



BEST PERFORMANCE. LOWEST COST.

TRASCO FIRST IN COMPARATIVE TESTS BY MAJOR RAILROAD. Of the three inert retarders tested, only the Trasco Car Retarder stopped a cut of 2 cars, gross wt. 315,200 lbs., entering at 6.3 MPH.

TRASCO INSTALLATION COSTS LOWEST. The Trasco Car Retarder is clamped in place without alteration to the track.

TRASCO MAINTENANCE MINIMAL. With full ballast beneath, the Trasco Car Retarder functions consistently in ice and snow.

ELIMINATES SKATEMEN—REDUCES DERAILMENTS

TRASCO AUTONOMIC RETARDERS

FOR FURTHER DETAILS WRITE: **TRACK SPECIALTIES COMPANY GENERAL MOTORS BUILDING, NEW YORK 19, N. Y.**

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1050 WESTPORT, CONN.

BLACK COPY

Turner Collie & Braden Inc.

P. O. Box 13089
Houston, Texas 77019
5757 Woodway
(713) 780-4100
Telex 77-4185

June 27, 1979

Rail Carrier Docket (ONAC 79-01)
Office of Noise Abatement and Control (AW-490)
U. S. Environmental Protection Agency
Washington, D. C. 20560

Subject: Commentary/40 CFR Part 201
Proposed Rulemaking:
Noise Emission Standards for Transportation
Equipment; Interstate Rail Carriers
(Fed. Reg., Vol. 44, No. 75, Tuesday, April 17, 1979)

79-01-154

Gentlemen:

After reviewing the proposed rulemaking as referenced, it appears that the Proposed Receiving Property Standards are established at too high a set of values to render them suitable for adoption. Your own references, under Section 5.0 Impact of the Proposed Regulation, indicate that such regulation would benefit an estimated 830,000 people out of the currently estimated four million people exposed to railyard noise levels above L_{dn} = 55 dBA.

Your reference to L_{dn} = 55 dBA, vis-a-vis the "1974 Levels Document", is understandable, but the overall reduction achieved amounts to a change in day-night levels of approximately 1.0 dBA. At an estimated cost of ninety-one million dollars, it is not apparent that any value is to be gained. In fact, this reduction would not generally be perceivable under typical field monitoring conditions.

My assessment is based upon a simple model of population density and acoustical propagation outdoors. Using this model, a reduction in day-night level of 10 dBA, the population benefited would amount to 3,600,000 people, or 90% of the currently exposed estimate. If attainable, this reduction would at least provide some measure of relief as intended by Section 17 to the Noise Control Act of 1972.

In summation, it appears, under the proposed regulation, that the overall reduction in the cumulative metric, L_{dn}, would not produce any meaningful

Consulting Engineers AUSTIN
DALLAS
HOUSTON
PORT ARTHUR

benefit. In other words, the absence of a regulation would result in the same, field verifiable, average population exposure as would occur if the proposed regulation is accepted with the currently specified limits. I therefore believe that the regulation requirements must be significantly reworked and strengthened to achieve positive benefit. As a constructive suggestion, it might prove helpful to run a series of Noise Impact Indices (NII) for the specific noise environment to determine the basis for a more thorough value-engineering study.

Unless further work is undertaken to address this problem, a needless expenditure of industrial funds will have been written into law. I would welcome further discussion or comment on this subject.

Very truly yours,

Jack E. Randorff

Jack E. Randorff, Ph.D.
Manager, Acoustical Technologies

JER:em

WABCO WESTINGHOUSE AIR BRAKE DIVISION
WILMERDING, PENNSYLVANIA 15148 • AREA CODE 412 • 271-1490

May 10, 1979

Mr. Henry E. Thomas
Director
Standards and Regulations Division
Office of Air, Noise, and Radiation
United States Environmental Protection Agency
Washington, D.C. 20460

Dear Mr. Thomas:

I wish to thank you for your letter of April 13, 1979 concerning the U.S. Environmental Protection Agency proposed revised and expanded railroad noise emission regulations.

The material which you supplied has been reviewed and the Westinghouse Air Brake Division of American Standard Inc., does not choose to comment on the proposed regulations. As a brake equipment supplier, we are presently cooperating with the AAR and others concerning locomotive and rail car noise reduction efforts.

Thank you for the opportunity to review the proposed regulation.

Sincerely,

D. J. Price
Vice President and General Manager

79-01-015

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ACOUSTICAL·SOCIETY·OF·AMERICA

ROBERT W. YOUNG
ASSOCIATE EDITOR

NAVAL OCEAN SYSTEMS CENTER
SAN DIEGO, CALIFORNIA 92152

THE JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA

5 July 1979

Rail Carrier Docket No. ONAC 79-01
Office of Noise Abatement and Control (ANR-490)
U.S. Environmental Protection Agency
Washington, D.C. 20460

79-01-67

Gentlemen:

1. This is to invite your attention to some technical inaccuracies in the proposed Rules for Noise Emission Standards ... for Rail Carriers, Federal Register Vol. 44, No. 75, April 17, 1979, and to offer words to correct those inaccuracies. Many of my suggestions are aimed at replacing the jargon of governmentese with plain language. Corrections of inaccuracies will possibly result in inconsistency with some earlier EPA documents in which the same inaccuracies occured; but now is the time to correct for the future.

2. A serious defect in the proposed Rules is the omission of the word "average" in the name of the quantity represented by the symbol L_{dn}. In an early report the EPA correctly told Congress it was going to use day-night average sound level (L_{dn}); the EPA should continue to say "average" where appropriate. It is extremely important that the word "average" be reiterated, again and again, so the public will understand that a 24-hour average sound level is being prescribed, and not a maximum sound level such as is commonly prescribed for a vehicle driveby. It is bad to require a reader to look at 4 pages before he is told what L_{dn} really is. I urge you to revise the fifth paragraph of 2.0 The Proposed Regulation to read:

> The letter symbol L_{dn} stands for day-night average sound level. This is a 24-hour average sound level, obtained after addition of ten decibels to sound levels in the night before 7 a.m. and after 10 p.m. Rationale for the use of this descriptor appears in Section 4.

3. The word Standard as used in these Rules means an upper limit not to be exceeded, not in the sense of a standard gallon that is neither to be exceeded nor subsided beyond certain tolerances. At the bottom of the middle column of page 22964, " ... to alter operations to achieve the 65 L_{dn} value" could be taken to mean that if the noise is less than the standard the noise should be increased to conform to the standard. A much better wording is " ... to alter the operations so as to lower the day-night average sound level at the yard boundary to 65 decibels." I suggest that "reduction" be described to conform to the standard, or that instead some term such as noise limit be employed.

4. Much of the jargon can be ameliorated by use of the long-standing editorial principle that text be written with full words rather than with quantity symbols or unit symbols. At the bottom of the third column of page 22962, "70-decibel standard" is correctly written out. In tables where space is limited, this would of course

RARD ANR-490 13 JUL 79 9:51

be 70 dB. Use of dB is acceptable in text if it is preceded by a number, in fact it is often preferable in technical writing, but I am suggesting that for regulations to be understood and discussed by the public that decibel be written out.

5. The clumsy clause on page 22965, "...people...exposed to day-night average railyard noise levels of 55 L_{dn} or greater" should be replaced by something like "...people... near railyards exposed to day-night average sound levels of 55 decibels or greater." On page 22964, "exceed the hourly L_{eq} value..." should be replaced by "...exceed the one-hour average sound level...." It is jargon in what is apparently the caption of Table 4.4, "...To Go From L_{dn}70 to L_{dn}65." This will be better understood when worded: "Additional costs to reduce the day-night average sound level at hump-yard boundaries from 70 to 65 decibels.

6. Enclosed are proof pages 6, 7, 8, 22, 23 of American National Standard Letter Symbols and Abbreviations for Quantities Used in Acoustics, Y10.11-[1979]. It is expected that this standard will receive final approval in 60 days. Notice on page 6 that the attachment of an A to dB is strongly deprecated, and that the decibel is not A-weighted. This is a long-standing principle for unit symbols, not new in Y10.11-1979 . The caption for Table 2.1(c) of the proposed Rules is "Equivalent of 70 L_{dn} for 24 Hours in A-weighted dB." This is wrong on several counts; let me note first of all that the A-weighted decibel should be erased from every EPA document as quickly as possible! In general, in text 70 dBA should be replaced by 70 decibels; in small space, by 70 dB. Section 201.16 is already correctly worded: "...an A-weighted sound level of 90 dB at 30 meters from the centerline...."

7. As mentioned above, throughout the Rules day-night sound level needs to be replaced by day-night average sound level, specifically in definitions (u), (ee), (hh) in Section 201.1. The word equivalent" is to be replaced by "average" in definitions (aa), (bb), (ff), and many places throughout the Rules. There is now nothing in the definitions (and correctly so) to explain that anything is equivalent to anything else; hence "equivalent" must be eliminated in the name also. It is a great disservice to mystify the public with an undefined hourly equivalent sound level, when hourly average sound level is relatively self-explanatory.

8. The sentence in (u), "When the day-night...begin at midnight", is not part of the definition. It should be moved to Section 201.31.

9. Contrary to (u), the abbreviation for day-night average sound level is DNL, per Y10.11- 1979 ; the quantity symbol for it is L_{dn}. Contrary to definition (w), dB is the unit symbol for decibel, not the abbreviation. For definition (bb), the term ought to be one-hour average sound level for which the abbreviation is 1HL and the convenient quantity symbol is L_{1h}.

10. In definition (dd), the word Fast should be inserted after greatest, even though it is technically included in definition (qq) for sound level. Fast (or FAST if preferred) should be similarly inserted throughout the text in connection with maximum sound level, because many people will not read as far as the definitions, and many think that only slow sound level is always measured.

11. I do not understand "Partial Day-night Sound Level", definition (hh). I do not understand why only "some of the hourly values" are utilized, if more are available. If one were to assume zero level for each hour for which a measured hourly average sound level is not available he would unavoidably arrive at a day-night average sound level less than the true day-night average sound level. I suspect that "extrapolated" might be more descriptive than "partial".

12. Only the first sentence of (pp) should be retained as the definition of sound exposure level. The remainder in much modified form belongs in Subpart D on measurement technique. But even there, the measurement should not be limited to times "when a specified threshold" is exceeded. In the practical measurement of sound exposure level there must be freedom to select whatever threshold is necessary to cope with the extraneous noise in a given situation. It is not feasible to set the threshold "at least ten decibels below the maximum sound level of the event" before the event has actually occurred; in some situations of steady background noise it is feasible to deduce the sound exposure level within ± 1 dB when the maximum sound level is only 6 dB above the background. There should be no "specified threshold" in these Rules.

13. The appearance of the word "means" in technical definitions is very disconcerting. It suggests that elsewhere in the technical literature "sound level", for example, is something different than what is defined here. I urge that you replace "means" by "is", so the correct definition will be copied in the many cities that look to the EPA for guidance. Better still, write the definitions in dictionary format, with "is" omitted and without initial capital letters; this is now the format required by standards bodies.

14. In Section 201.31(a)(1) for sound exposure level, an integrating sound level meter is not required to have any sensitivity to sounds that last less than 100 milliseconds. Such a loose requirement is very inadequate for the very impulsive sounds of car coupling and hump yards. Portable instruments are now available for measuring sound exposure level, automatically, of pulses as short as 1 ms, within ± 1 dB of the theoretical level of the pulse relative to steady state. I suggest that instrumentation be required to integrate correctly within ± 1 dB, as short as 2 ms.

15. It would be a mistake in 201.31(b)(2) for one-hour average sound level, to require only that signals that last longer than one second and whose frequencies lie between 200 and 1000 hertz need be integrated correctly. While it is true that some of the instruments which were used to collect the background information for this rail carrier regulation may not have been capable of integrating correctly sounds lasting less than a second, instruments are available that will integrate and average correctly pulses shorter than 1 ms. It is important to specify instrumentation that will integrate and average correctly all the sound that occurs during an hour, within the tolerances at different frequencies for a Type 1 sound level meter, whether the sound is steady or consists of isolated tonebursts each as short as 2 ms.

16. Sound exposure level is given much less attention in the proposed Rules than it really deserves. The present measurement of fast sound level at 7 or 30 meters from the source gives no indication of how long a sound lasts or how frequently it occurs. But sound exposure automatically takes into account both magnitude and duration. The sound of any discrete event, such as a sucession of car couplings or the passing of a train, should be monitored by sound exposure level, not by maximum sound level. If desired, sound exposure level can be obtained for all the sounds that occur in an hour.

17. I do not agree that (at the middle of page 22961) "Tables 2.1(c) and 2.1(d) provide a simplified reference for determining the compliance...." Even with informative table captions (the present ones are not), the method is unduly involved. It is not adequate to assume that all the noise that will occur at a site has occurred during the hour or two during which someone happened to measure. The costs of making remedial changes in railroad equipment are so high, in comparison with running

an automatic noise monitoring equipment for a week or so, that there is no justification to report compliance or non-compliance on the basis of a test for an hour or two. What constitutes a "long-enough" test period depends upon the typical distribution of the rail carrier operations. Largely from my experience with highway noise and airport noise I am guessing that a week is the minimum period during which the one-hour average sound level and the day-night average sound level ought to be monitored. Ordinarily it is not worth while to monitor maximum sound levels during the week.

18. Nevertheless, if a rough screening test is wanted, it can be made easily by measuring the one-hour average sound level at the nearest residence. If the measurement was made in the daytime and it exceeded the day-night average sound level limit for that location, then more monitoring may be in order; if the measurement was made at night and if the one-hour average sound level was greater than the limit there minus 10 decibels, likewise more monitoring may be in order. But none of this is conclusive.

19 It is alleged on page 22964, first column, that a day-night average sound level, being a 24-hour average, does not account sufficiently for the irritating and intrusive screeches of retarders being clamped against wheels. In a superficial glance at the background information, I did not see any tests in support of this allegation. I did notice, however, that some instrumentation used is not capable of adequately integrating the short screeches. It is not feasible for a local government - nor for the FRA - to monitor the fast sound level of isolated screeches that may occur at any time of the day or night, particularly if the speed of the car must also be measured. But it is feasible and cost effective, to install in residential areas an automatic environmental noise monitor of adequate dynamic range that unattended will print in compact format the one-hour average sound level, the day-night average sound level, and sound exposure levels (with times of occurrence) of especially noisy events. (At least two models will also print the maximum sound level during a noisy event but I have seen little use later made of such data.) I believe the Rules should be simplified by elimination of limits on maximum sound level at stated distances.

20. Most of the advice above is aimed at making rules for noise abatement easy to understand and to enforce, by use of average sound levels, plain English and full words, in consonance with Executive Order 12044. When abbreviations or letter symbols are needed, they should be taken from ANS Y10.11-1979. There are other EPA noise standards and regulations to which this advice is also relevant; I suggest that copies of this advice be made available to those in the EPA who are preparing or revising other noise regulations.

Respectfully submitted,

Robert W. Young

Robert W. Young, Ph.D.

Encl: Y10.11-1979 pages
6,7,8,18,22,23.

5.3.1 Attachments to Unit Symbols. Because a unit is fixed and unique, it cannot be modified. On the other hand, a variable quantity which may be modified is independent of the unit in which it is measured. For both reasons, it is misleading and incorrect to attach any letter to a unit symbol in an attempt to qualify, modify, or describe the quantity whose unit it represents. Exceptions are those cases where a subscript changes the meaning of a unit symbol as, for example gal_{US}, gal_{UK}, cal_{IT}, cal_{th}. Such cases rarely occur in acoustics.

Any attachment to a unit symbol, other than a standard prefix, is strongly deprecated.

5.3.2 Indication of the Unit of a Quantity. In text, when the unit of a quantity is mentioned, the name of the unit should be spelled out in full, e.g., attenuation coefficient in decibels per meter. A slight condensation may be attained with a comma or parentheses, e.g. attenuation coefficient, decibels per meter, or attenuation coefficient (decibels per meter). However, a unit symbol is allowed in text, and often is preferred, when preceded by a numeral, e.g. The 1-kHz sound pressure level was 70 dB.

In graphs and tables, where space permits, the name of the unit should be similarly spelled out. Where space does not permit, the unit symbol should be used.

5.4 Remarks Concerning Levels

A level is treated like any other quantity and may be represented by a quantity symbol with a subscript, as listed in Tables 9 and 10. The name level, by itself, is incomplete because there are many different kinds, e.g. voltage level, power level, and A-weighted sound level. Moreover, the statement of the value of a level is incomplete unless the reference quantity is known to the reader.

5.4.1 Notation for expressing the reference of a level. A level representing a quantity x with a reference quantity x_{ref} may be indicated by:

$$L_x\ (\mathrm{re}\ x_{ref})\ \text{or by}\ L_{x/x_{ref}}$$

Examples:

The statement that a certain sound pressure level in air is 15 dB above the level corresponding to a reference pressure of 20 μPa can be written as:

$$L_p\ (\mathrm{re}\ 20\mu\mathrm{Pa}) = 15\ \mathrm{dB}\ \text{or as}\ L_{p/20\ \mu\mathrm{Pa}} = 15\ \mathrm{dB}$$

The statement that the level of a current is 10 Np below 1 A can be written as:

$$L_I\ (\mathrm{re}\ 1\ \mathrm{A}) = -10\ \mathrm{Np}$$

The statement that a certain power level is 72 dB above 1 pW can be written as:

$$L_K\ (\mathrm{re}\ 1\ \mathrm{pW}) = 72\ \mathrm{dB},$$

in a situation where the reserve symbol L_K is needed to avoid confusion.

The statement that a certain electric field strength is 50 dB above 1 μV/m can be written as:

$$L_E\ (\mathrm{re}\ 1\ \mu\mathrm{V/m}) = 50\ \mathrm{dB}.$$

In presenting data, particularly in tabular form or in graphical symbols, a condensed notation is often needed for identifying the reference value. Then the following condensed form, illustrated by application to the above examples, may be used:

15 dB (20 μPa)
- 10 Np (1 A)
72 dB (1 pW)
50 dB (1 μV/m)

Note that there is a space before the parentheses.

A "1" in the expression of a reference quantity is sometimes omitted. This is not recommended because confusion may occur

When a constant reference quantity is used repeatedly in a given context and explained in the text, it may be omitted.

5.4.2 Indication of the Weighting of a Level. Frequently in acoustics, a sound pressure level or a sound power level is said to be weighted according to the A, B, C, or other frequency weighting curve. These are commonly called weighted levels, but properly should be called levels of weighted pressure or power. With any weighted level, the unit of measurement is unchanged. It is still the decibel, or bel, or neper. The practice of indicating weighting by attaching letters to dB, as in dBA or PNdB, has led some persons to the incorrect belief that weighted levels are measured on a different scale, or by a frequency weighted decibel. *Such attachments are incorrect, and are strongly deprecated. (See paragraph 5.3.1.)*

The designation PNdB is deprecated for any use, whether to mean perceived noise level or a nonexistent perceived noise decibel.

The decibel itself is never weighted. The symbol dB is a unit symbol, and is neither a quantity symbol nor an abbreviation for level.

Any qualification of a level should be indicated, not by attaching letters to the unit symbol dB or B or Np, but by attaching appropriate subscripts to the quantity symbol L, or by an appropriate abbreviation, as in Tables 9 and 10. An example is L_{AF} for fast, A-weighted sound level. In a limited context, where it has been made clear what kind of weighting is concerned, the symbol L may be used without a subscript.

5.4.3 Sequence of Subscripts for a Level. A succession of subscripts on L, the quantity symbol for a level, identifies the kind of level and frequencywise and timewise modifications of it. For example, L_{PA} first of all represents the level of a power for which the symbol is P; secondly, the A signifies that the A-frequency weighting was applied.

In acoustics, the absence of a first subscript for the kind of level is an indication that the symbol L stands for a sound pressure level. The subscripts signify modifications of sound pressure level. For example, L_{AS} represents the level of A-frequency weighted, squared sound pressure followed by slow exponential time averaging.

As another example, L_{C8h} represents an 8-hour average, C-weighted sound level; the C-frequency weighting was applied to the sound pressure signal; next the sound pressure was squared; then the arithmetic mean of the squared sound pressures was taken during 8 hours; finally the level was obtained.

Sound level is understood to mean A-weighted sound pressure level if no frequency weighting is specified. Hence in a context in which only sound level is involved, L represents (A-weighted) sound level, and L_{av8h} or simply L_{8h} represents an 8-hour average sound level. The usual unit of all these levels is the decibel.

Maximum tone-corrected perceived noise level is a special frequency-weighted sound pressure level with nominally "slow" time averaging. The quantity symbol is L_{PNTmax}. The first two subscript letters PN signify the somewhat involved "perceived noise" frequency weighting; the subscript T signifies a further frequency weighting for prominent tonal components; after the slow exponential time average, another time weighting identified by max is applied by selection of the greatest tone-corrected perceived noise level that occurs during (for example) the flyover of an aircraft.

5.5 Remarks Concerning Abbreviations

An abbreviation is a shortened form of a word or phrase, used to represent the complete form. The shortened form is attained by omission of some letters, even all of the letters of some words. The abbreviations recommended in this Standard use capital letters, particularly for convenience in the use of a computer-controlled printer which often can print only capitals.

5.5.1 Use of Abbreviations. Abbreviations are to be used only where necessary to save space or time. The time saved by a writer who uses an abbreviation is often less than the time lost by each reader who must find its meaning. An abbreviated term should be spelled out in full at its first appearance in text, followed by the abbreviation in parentheses. In addition, a glossary may be provided for the convenience of the reader.

Abbreviations for the names of quantities are used as nouns because the names they stand for are nouns or noun phrases. They may also be used as adjectives, as for example: "the day-night average sound level limit" may be abbreviated to "the DNL limit". As a further example, the statement: "The limit is 92 decibels, fast, A-weighted sound level at 15 meters" can be shorted to "The FA limit at 15 m is 92 dB".

Abbreviations should not immediately follow a unit symbol. For example, instead of "92 dB FA", use "FA: 92 dB".

5.5.2 Foreign Use. Abbreviations should be especially avoided in publications and drawings that are intended for circulation in foreign countries, because they are formed from words that often differ from one language to another. In this respect, abbreviations stand in contrast to letter symbols for quantities and units that are standardized internationally.

5.5.3 Mathematics. Abbreviations should not be used in mathematical formulations. Letter symbols should be used instead.

5.5.4 Sequence of Letters in an Abbreviation. The original sequence of letters in the words, and of words in any phrase, is to be maintained in an abbreviation. As an example, day-night average sound level is abbreviated to DNL; the single letter L in this context serves as the abbreviation for average sound level. LDN or Ldn is not correctly an abbreviation for day-night average sound level because LDN or Ldn is not a shortened form of the full phrase.

In phrases and abbreviations in this Standard for oscillating quantities, the averaging time is stated first, the limiting frequency band second, the kind of variable is next, and finally level. For example, 8HL is the abbreviation for 8-hour average sound level; much of the abbreviation is feasible because sound level unmodified has the connotation of sound pressure level within the frequency band delimited by the A-frequency weighting. As a longer example of the sequence, slow octave-band sound pressure level centered on 125 hertz may be abbreviated to SOBSPL at 125 Hz.

5.5.5 Invariance of Form. The form of an abbreviation shall be invariant. Syntactical endings shall not be used. For example, an *s* shall not be added to indicate plural.

5.5.6 Subscripts. Subscripts should not be used in or with abbreviations.

5.5.7 Punctuation. Except as shown in abbreviations in this Standard, punctuation marks shall not be used as part of an abbreviation. However, a period may be placed at the end of any abbreviation that spells an English word if the omission of such a period could result in confusion.

5.5.8 Capitalization. As a general rule, lower case letters are recommended for abbreviations in text and in tabular matter when the words for which they stand for would normally be printed in lower case. This Standard, however, shows abbreviations in capitals in accordance with long-standing practice in acoustics.

5.5.9 Additional Abbreviations. For abbreviations of terms other than those in this Standard, authors are advised to refer to American National Standard ANSI Y1.1-1972, Abbreviations for Use on Drawings and in Text.

INTRODUCTION TO THE TABLES

Tables 1 through 10 list quantities, grouped in several categories, and give quantity symbols for each. In addition, Tables 8 through 10 give standard abbreviations for the quantities listed in them. (Abbreviations are usually not appropriate for the quantities listed in Tables 1 through 7.) Only abbreviations are given for some quantities that are not operated on mathematically, and so do not require letter symbols. To aid in identifying the quantities, their units based on the International System (SI) and their standard unit symbols are included.

A quantity shall be represented by the standard symbol appearing in the Tables, regardless of the units in which it is expressed. Those quantity symbols that are separated by a comma are alternatives on equal standing. A symbol enclosed in parentheses is a reserve symbol, to be used only where there is a specific need to avoid a conflict.

Tables 1 through 5 contain quantities of interest in acoustics, many of whose symbols have already been standardized for broad fields of application. These have been copied from ANSI Y10.5-1968 and the same item numbers retained. Those items not commonly of interest in acoustics, including all of Table 4 RADIATION AND LIGHT, have not been copied, and consequently there are gaps in the item numbers. A few items not in ANSI Y10.5-1968 have been added, and given numbers followed by a letter. Every item identified by a number without a letter has been copied with no change in the letter symbol, except where noted under Remarks. Tables 6 through 10 contain quantities of interest primarily in acoustics, and bear no particular relation to ANSI Y10.5-1968.

Quantity symbols and abbreviations are listed alphabetically in Tables 11 and 12 for ready reference. Finally, all quantities, together with variants of their names, are listed in the index.

TABLE 6. ACOUSTICS (Cont'd)

Symbols for Quantities

Item	Quantity	Quantity Symbol	Unit Based on International System	Unit Symbol	Remarks
6.27	sound energy	E, W	joule	J	Use subscripts P and K to denote potential and kinetic energy, cf. 2.23 a and 2.23 b.
6.28	sound energy density	$w\ (e)$	joule per cubic meter	J/m^3	
6.29	sound exposure at xdB per halving of duration	E_x	pascal to the $6/x$ power times hour	$Pa^{6/x}h$	$E_x = \int_0^t p^{6/x}\,dt$ The sound pressure may be frequency weighted.
6.30	sound exposure (at 3 dB per halving of duration)	$E\ (E_3)$	pascal squared times hour	Pa^2h	1 Pa^2h is the exposure for 8 h at 85 dB re 20 μPa.
6.31	sound exposure at 5 dB per halving of duration	$E\ (E_5)$	pascal to the 1.2 power times hour	$Pa^{1.2}h$	1 $Pa^{1.2}h$ is the exposure for 8 h at 70 dB re 20 μPa.
6.32	characteristic impedance of a medium	Z_c	pascal second per meter	Pa·s/m	$Z_c = \rho c$
6.33	specific acoustic impedance	Z_s	pascal second per meter	Pa·s/m	$Z_s = p/u$
6.34	specific acoustic admittance	Y_s	meter per pascal second	m/(Pa·s)	$Y_s = 1/Z_s$
6.35	acoustic impedance	Z_a	pascal second per cubic meter	$Pa \cdot s/m^3$	$Z_a = Z_s/A = R_a + jX_a$
6.36	acoustic resistance	R_a	pascal second per cubic meter	$Pa \cdot s/m^3$	
6.37	acoustic reactance	X_a	pascal second per cubic meter	$Pa \cdot s/m^3$	$X_a = m_a\omega - K_a/\omega$
6.38	acoustic mass, acoustic inertance	m_a	pascal second squared per cubic meter	$Pa \cdot s^2/m^3$	$m_a = X_a/\omega$ 1 $Pa \cdot s/m^3$ = 1 kg/m^4
6.39	acoustic stiffness	K_a	pascal per cubic meter	Pa/m^3	$K_a = -\omega X_a$
6.40	acoustic admittance	Y_a	cubic meter per pascal second	$m^3/(Pa \cdot s)$	$Y_a = 1/Z_a = G_a + jB_a$
6.41	acoustic conductance	G_a	cubic meter per pascal second	$m^3/(Pa \cdot s)$	
6.42	acoustic susceptance	B_a	cubic meter per pascal second	$m^3/(Pa \cdot s)$	
6.43	acoustic compliance	C_a	cubic meter per pascal	m^3/Pa	$C_a = 1/K_a$
6.44	mechanical impedance	Z_m	newton second per meter	N·s/m	$Z_m = AZ_s = R_m + jX_m = F/v$
6.45	mechanical resistance	$R_m\ (c)$	newton second per meter	N·s/m	Also called damping coefficient, but that is deprecated for this purpose, cf. 6.69
6.46	mechanical reactance	X_m	newton second per meter	N·s/m	$X_m = m_m\omega - K_m/\omega$
6.47	dynamic mass	m_m	kilogram	kg	$m_m = X_m/\omega$
6.48	dynamic stiffness	K_m, k	newton per meter	N/m	$K_m = -\omega X_m$
6.49	mechanical admittance, mobility	Y_m	meter per newton second	m/(N·s)	$Y_m = 1/Z_m = G_m + jB_m = v/F$
6.50	mechanical conductance	G_m	meter per newton second	m/(N·s)	

TABLE 9. LEVELS AND NOISE RATINGS

Abbreviations and Symbols for Quantities

Item	Quantity	Abbreviation	Quantity Symbol	Unit Symbol	Remarks
9.1	sound pressure level in a stated frequency band	SPL	L_p	dB	The symbol N for level is deprecated
9.2	fast A-weighted sound level	FA	L_{AF}	dB	
9.3	slow A-weighted sound level	SA	L_{AS}	dB	
9.4	fast B-weighted sound (pressure) level	FB	L_{BF}	dB	
9.5	slow B-weighted sound (pressure) level	SB	L_{BS}	dB	
9.6	fast C-weighted sound (pressure) level	FC	L_{CF}	dB	
9.7	slow C-weighted sound (pressure) level	SC	L_{CS}	dB	
9.8	fast D-weighted sound (pressure) level	FD	L_{DF}	dB	
9.9	slow D-weighted sound (pressure) level	SD	L_{DS}	dB	
9.10	octave-band sound pressure level	OBSPL	$L_{1/1}$	dB	
9.11	one-third-octave-band sound pressure level	TOBSPL	$L_{1/3}$	dB	
9.12	sound power level	PWL	L_P (L_K)	dB, B	Substitute B, C, etc. to denote other weightings
9.13	A-weighted sound power level	APWL	L_{PA} (L_{KA})	dB, B	
9.13a	noise power emission level	NPEL	L_{NPE}	B	$L_{NPE} = L_{PA}$
9.14	product noise rating, hemispherical source sound level	PNR		dB	Space average sound level at 1 m; see ANSI S3.17-1975.
9.15	sound pressure spectrum level	PSL	L_{ps}	dB	
9.16	impulse A-weighted sound level	IAL	L_{AI}	dB	Substitute B, C, etc. to denote other weightings.
9.17	average sound level during time T	TAL	L_{avT}	dB	$L_{avT} = 10 \log (E/p_0^2 T)$ where $p_0 = 20\ \mu Pa$.
9.17a	equivalent steady sound level	QL	L_{eq}	dB	Same as average sound level.
9.18	hourly average sound level	1HL	L_{1h}	dB	Also called 1-hour equivalent continuous sound level
9.19	8-hour average sound level	8HL, 8HAL	L_{A8h}	dB	Substitute B, C, etc., in abbreviation and symbol to denote other weightings.
9.20	day average sound level	DL	L_d	dB	0700-2200 hours
9.21	daytime average sound level	DTL	L_{d12}	dB	0700-1900 hours
9.22	evening average sound level	EL	L_{ev}	dB	1900-2200 hours
9.23	night average sound level	NL	L_n	dB	0000-0700 and 2200-2400 hours
9.24	day-night average sound level	DNL	L_{dn}	dB	24 h average after 10 dB added to L_n
9.25	community noise equivalent level	CNEL	L_{den}	dB	24 h average after 5 dB added to L_{ev} and 10 dB to L_n
9.26	A-weighted sound exposure level	ASEL, SEL	L_{AE} (L_{AX})	dB	The level of E (see item 6.30) re $(20\ \mu Pa)^2$ and 1 s. Substitute B, C, etc. to denote other weightings.
9.27	fast, A-weighted sound level exceeded 10% of time		L_{10}	dB	Other exceeded percentiles are similarly indicated.

TABLE 9. LEVELS AND NOISE RATINGS (Cont'd)

Abbreviations and Symbols for Quantities

Item	Quantity	Abbreviation	Quantity Symbol	Unit Symbol	Remarks
9.28	noise pollution level	NPL	L_{NP}	dB	$L_{NP} = L_{eq} + 2.56\sigma$ The constant 2.56 is subject to revision. σ = standard deviation.
9.29	maximum A-weighted sound level	MXAL	L_{Amax}	dB	Greatest fast, A-weighted sound level during an event, unless other time and frequency weightings are indicated by appropriate subscripts.
9.30	peak A-weighted sound level	PKAL	L_{Apk}	dB	Greatest instantaneous A-weighted sound level. Substitute *B*, *C*, etc. to denote other weightings.
9.31	noise and number index	NNI		dB	$L_{PNmax} + 15 \log n - 80$ n = number of audible events.
9.32	traffic noise index	TNI		dB	$L_{90} + 4(L_{10} - L_{90}) - 30$
9.33	noise criterion level	NC		dB	Level at 1.7 kHz of a noise criterion curve, tangent to octave-band spectrum. (See L. L. Beranek, *Noise Control*, vol. 3, pp. 19–27, January 1957.)
9.34	preferred frequency noise criterion level	PNC		dB	Level at 1.0 kHz of noise rating curve tangent to octave-band spectrum. (see Beranek, Blazier and Figwer, J. Acoust. Soc. Am. 50, 1223 (1971).)
9.35	rating sound level (ISO 1996-1971)		L_r	dB	24 h average sound level plus any correction for tone or impulse.
9.36	ARI sound rating number	SRN		3.3 dB	Equal to 0.4 plus 0.30 times A-weighted sound level at 10 ft. (See ARI Standard 275-69)
9.37	ARI sound level number	SLN		3.3 dB	Such use of "sound level" is deprecated.
9.38	sound transmission loss, sound reduction index, sound insulation (of a partition)	TL	R	dB	See ASTM E90 and E336, also ISO/DIS 140/III.
9.39	noise reduction	NR	D_f	dB	Difference in space-time-average sound pressure level in two rooms at frequency f.
9.40	level reduction (by a barrier)	LR		dB	
9.41	sound level difference	SLD	D_A	dB	
9.42	field transmission loss (of a partition)	FTL		dB	See ASTM E336
9.43	sound transmission class (of a partition)	STC		dB	See ASTM E413
9.44	field sound transmission class (of a partition)	FSTC		dB	See ASTM E336
9.45	airborne sound insulation (of a partition)		I_a	dB	See ISO/R 717-1968 Rating of sound insulation for dwellings
9.46	noise isolation class (between rooms)	NIC		dB	See ASTM E336
9.47	normalized noise isolation class (between rooms)	NNIC		dB	Normalized to T_{60} = 0.5 s (See ASTM 336)

ASSOCIATION OF
AMERICAN RAILROADS
LAW DEPARTMENT
AMERICAN RAILROADS BUILDING • WASHINGTON, D. C. 20036 • 202/293-4086

HOLLIS G. DUENSING
General Attorney

July 2, 1979

Rail Carrier Docket No. ONAC 79-01
Office of Noise Abatement Control
U.S. Environmental Protection Agency
Washington, D.C. 20460

Dear Sir:

Re: Proposed Noise Emission Standards for Transportation Equipment; Interstate Rail Carriers. 40 C.F.R. Part 201 -- Rail Carrier Docket No. ONAC 79-01 (ANR-490)

79-01-137

Enclosed for filing in the above-captioned rulemaking proceeding are five copies of the Comments of the Association of American Railroads. Pages 100 through 110 and 122 through 126 have not been included due to a technological malfunction of the Word Processing Machine. These pages will be hand carried to your office as quickly as possible.

Respectfully submitted,

Hollis G. Duensing

Hollis G. Duensing

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ASSOCIATION OF
AMERICAN RAILROADS
LAW DEPARTMENT
AMERICAN RAILROADS BUILDING · WASHINGTON, D. C. 20036 · 202/293-4086

HOLLIS G. DUENSING
General Attorney

July 3, 1979

Rail Carrier Docket No. ONAC 79-01
Office of Noise Abatement Control
U.S. Environmental Protection Agency
Washington, D.C. 20460

Attention Mr. Henry Thomas
Director, Standards & Regulations Div.
Office of Noise Abatement & Control

Re: Proposed Noise Emission Standards for Transportation Equipment; Interstate Rail Carriers. 40 C.F.R. Part 201 -- Rail Carrier Docket No. ONAC 79-01 (ANR-490)

79-01-137

Gentlemen:

Enclosed are pages 100-110, 122-126, 135-136 and 157-160 of the comments of the Association of American Railroads. The bulk of the comments and the exhibits filed by the Association of American Railroads were submitted yesterday, on July 2. However, these few remaining pages spent the night lodged in a malfunctioning word processing machine. I hope the several hour delay in receiving these additional pages has not inconvenienced the agency.

Respectfully submitted,

Hollis G. Duensing

Hollis G. Duensing

enclosures

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BEFORE THE

UNITED STATES ENVIRONMENTAL

PROTECTION AGENCY

Office of Noise Abatement

and Control

Proposed Noise Emission Standards for Transportation Equipment; Interstate Rail Carriers. 40 CFR Part 201	)))))	Rail Carrier Docket Number ONAC 79-01 (ANR-490)

COMMENTS OF THE ASSOCIATION OF AMERICAN RAILROADS

I. Introduction

These comments are filed on behalf of the members of The Association of American Railroads (AAR) in response to the Notice of Proposed Rulemaking published in the Federal Register of April 17, 1979 (44 F.R. 22959 et seq). The AAR is a voluntary, nonprofit Association; and its membership includes substantially all Class I and Class II railroads in the United States which are surface carriers by railroad engaged in interstate commerce within the meaning of Section 17 of the Noise Control Act of 1972 (the Act), 42 U.S.C. §4901 et seq.

The AAR actively participated in the rulemaking proceedings in which the existing standards applicable to locomotives and rail cars were developed (40 C.F.R. Part 201) and, with several individual railroads, sought judicial review of the EPA's prior determination not to issue standards for all railroad equipment and facilities. Association of American Railroads, et al. v. Costle, 562 F.2d 1310 (D.C. Cir. 1977).

The AAR and its member railroads sought judicial review of the EPA's determination not to issue Federal standards covering all railroad equipment and facilities, even though such action put the railroads in the unusual position of compelling a Federal regulatory agency to regulate them to the fullest extent. This was necessary because Section 17 imposes on EPA the obligation to set only such standards as may be achieved through application of the best available technology and which take into account a comparison of the cost of compliance with the benefits to be achieved. Absent the proper implementation of Section 17, state and local authorities would not be bound by such technology and cost considerations in developing their own noise regulations applicable to railroads.

As EPA acknowledges in its Notice, the "best available technology" must have been demonstrated and known to be effective and feasible; it must be available; and it must be compatible with safety regulations, operational considertions, and other pollution control equipment.

(44 F.R.22962) At the same time, EPA acknowledges that "it is inherent in Section 17(a) that the costs that are imposed for noise control must be reasonable." (44 F.R. 22963) This interpretation of Section 17, which the AAR advocated, assures that consideration of available technology and cost of compliance will govern EPA's development of the industy-wide Federal standards under Section 17(a) and will also govern the granting of special permission to state and local authorities to impose other controls under Section 17(a)(2).

The railroads' concern that action be taken to insure protection from local noise regulations is well justified. Local and state noise control authorities are generally not well versed in railroad noise abatement technology and consequently the regulations which have heretofore been imposed on railroad operations have been arbitrary and unsupported nationally. They have been enacted with no consideration of the abatement technologies available or the economic impact resulting from attempting to comply with the regulations. The results of the National Association of Noise Control Officials (NANCO) survey conducted in April, 1978, relating to the proposed standard demonstrate the serious nature of this situaton. Question 7 states: "Assuming EPA sticks with L_{dn} as the noise descriptor for property line noise enforcement, which of the following standards would you consider most appropriate?" In response to that question, 32 percent of the state and local noise control officials favored an L_{dn} 55 dB. It is astounding that 32 percent of the state and local noise officials are so uninformed or so naive that they would encourage the adoption of a standard which is impossible to attain. It is clear from a review of the results of that survey that the majority of the respondents have no idea what is involved in railroad noise control, even after reviewing EPA's Background Document and Notice.

Basically, the opinion of the Court of Appeals for the District of Columbia Circuit dealt only with the extent to which EPA was required to regulate all railroad equipment and facilities, but the effect of that decision was to ensure that the noise standards which railroads will ultimately be required to meet will be developed within the constraints of the technology and cost criteria of Section 17. In ordering the EPA to develop standards for all railroad equipment and facilities, the Court specifically noted that it was not addressing the "degree of regulation" or the "manner in which the 'equipment or facilities' are regulated" (AAR v. Costle, supra at 1321). The questions of whether the "degree of regulation" and "manner" of regulating meet the technology and cost criteria of Section 17 are properly the subject of this rulemaking proceeding.

Subsequent to the Court decision and throughout the research effort leading up to the development of the current proposals, the AAR and its member railroads have cooperated with EPA by supplying data developed by the railroad industry, by giving EPA and its contractors unlimited access to rail facilities, and by responding to EPA's every request for information and assistance. Since the EPA and the railroads have essentially the same data and have equal access to relevant sources of information, it would not be unreasonable to expect that the EPA and the railroads would be in substantial agreement as to the technology which is available for effectively abating railroad noise emissions and the cost of such technology. Unfortunately, that is not the case. An analysis of EPA's proposed standards and the "Background Document for Proposed Revision to Rail Carrier Noise Emission Regulations" (EPA 550/9-78-207; Feb. 1979) reveals no defensible basis for the standards proposed by EPA.

The standards proposed in this rulemaking limit permissible noise levels in the receiving property surrounding railroad yards using the L_{dn} descriptor, which adds 10 dB to noise level occurring during nighttime hours, and specific point source standards on retarders, mechanical refrigeration cars, and car impacts in switching operations. The EPA identified specific noise abatement techniques, including installation of identified technology and application of operational changes, which it asserts will enable the railroads to meet the L_{dn} standards and the point source standards. These abatement techniques are not expressly mandated in the proposed regulations themselves, but it is clear from a reading of the Notice and Background Document that EPA has concluded that this "available technology" must be employed if the standards are to be met. In the process of attempting to meet the cost criterion of Section 17, the EPA assigns certain costs to the abatement techniques which must be employed to meet selected noise levels and attempts to analyze the economic and financial impact those costs would have on the railroad industry as a whole, as well as on certain specified railroads.

As a measure of the reasonableness of requiring the application of the abatement techniques and imposing the associated costs on the railroad industry, EPA attempted to quantify the public health and welfare benefits by estimating the number of people currently subject to annoyance by railroad noise who might be expected to experience a reduction in railroad noise if the railroads installed and implemented all of the identified noise abatement techniques. Contrary to the conclusion reached by EPA, independent analysis shows that the projections of current annoyance are most probably overestimates, while the estimates of reduction in annoyance that will result from reductions in railroad noise are almost certainly overestimates.

In past discussions with EPA representatives regarding the proposed regulations, it has been freely admitted that there are many areas concerning both the suggested noise control of major railroad equipment and the community impact analysis for which little or no background information exists. Thus many assumptions in EPA's analysis have been made on the basis of little or no actual data. The stated view of EPA has always been that, unless there is additional information available to fill these gaps, there is little need to point them out.

This is not our view. We believe that it is of value to recognize the deficiencies in the present analysis, even if these deficienceis cannot be corrected at present time. In order to understand this position, it is necessary to consider the general nature of the proposed regulation and the reasons for the weaknesses in the analysis.

The deficiencies in the present analysis may exist in part because of the extremely compressed time scale that was available to carry out the analysis. The normal review cycle in which EPA has previously developed regulations is approximately three years. Most of these previous regulations have involved measurements of simple sound level values at one or more fixed measurement positions relative to single well-defined sources. The sources regulated have been of the same general type, and the duty cycle of the source has been well specified. Thus the measurement procedures involved in determining compliance and the noise control options available to achieve compliance have been rather straightforward.

In the present case in which regulations are proposed to control the noise emission from railroad yards, the situation is considerably more complex. A single source is not being regulated, but rather a multitude of sources must be controlled to reduce the noise emission. The duty cycles of the sources are not constant or well defined nor are their positions relative to the measurement point. The L_{dn} acoustic metric used in the proposed regulation is not a simple instantaneous sound level measurement but rather a temporal average over an extended time period. Thus it becomes impossible to exclude measurement of noise from non-railroad sources, so that additional complexities must be involved in order to determine the railroad contribution.

In addition, there is another problem associated with the use of the L_{dn} metric as it is proposed in this regulation. Although this metric with its nighttime penalty of 10 dB was developed primarily to protect against sleep interference in residential neighborhoods, in this regulation its use is proposed in industrial and commercial areas as well as in residential areas. Because this application of L_{dn} is inconsistent with its basic purpose and because the nature of railroad scheduling demands nighttime yard operations at a level similar to that in the daytime, the present regulation imposes a considerable burden on the railroad industry with little resultant benefit to the public. It is our view that this point has not been sufficiently considered in preparing the proposed regulation.

Given this list of additional complexities beyond those involved in previous regulations, it would be reasonable to assume that more time than normal would be spent in preparing the proposed regulations in order that gaps in our present understanding of railroad yard noise sources and their control could be adequately filled. However, even with time extensions, much less time has been spent preparing these regulations than has been previously devoted to simpler regulatory situations. Thus it is not surprising that many deficiencies exist in the present analysis.

It is not our intent, in the very limited time period available for comment on these proposed regulations, to supply information that will allow all of the deficiencies we identify to be removed. Rather, it is our purpose to identify all major deficiencies so that a judgment can be made as to the sufficiency of the present analysis.

The adoption of the proposed regulations for railroad yard noise would lead to the expenditure of hundreds of millions of dollars by the railroad industry for noise control. Given the finite amount of money available for the control of pollutants of all types -- many more threatening than noise emission -- it would be unreasonable if any funds were spent based on EPA's limited analysis and in some instances erroneous assumptions and conclusions. Unless a more complete understanding of railroad yard noise sources and their control is achieved, and unless the EPA corrects the deficiencies in its proposals, this may indeed be the case.

Thus it is our view that, even without being able to correct all existing deficiencies because of the limited time available to analyze the proposals and develop recommendations, it is necessary to point them out so that it may be decided if the present state of understanding of the problem and its solution is adequate to decide appropriate and equitable regulatory standards.

Unfortunately, the conclusions reached by EPA are based on erroneous assumptions, are contradicted by the facts, and resulted from improper and incomplete analysis.

Thus, the EPA's proposals fail to meet the criteria of Section 17 and should be revised for the following reasons:

1. The proposed standards use an inappropriate descriptor and are unreasonably low.

   The use of the L_{dn} descriptor for standards applicable to the railroad industry is unreasonable because it fails to recognize the necessity of conducting railroad operations on a 24-hour basis.

   The use of the L_{dn} descriptor in areas other than residential, as is required by the proposed standard, is inappropriate since the primary reason for the 10 dB nighttime penalty in the L_{dn} metric is to prevent sleep disturbance.

2. The EPA has failed to show that the standards can

e met. Indeed, the available technology identified by EPA (i.e., the recommended abatement techniques) is demonstrably ineffective for meeting the receiving property standards and the point source standards.

3. The estimated costs of the abatement techniques have been grossly understated, and many implementation and compliance costs have been completely overlooked or ignored.

-- The true costs of installing and implementing the abatement techniques are unreasonably high and cannot, under the criteria of Section 17, be imposed on the railroad industry.

-- It would be arbitrary to impose such costs as the EPA would do. This is particularly true when it can be demonstrated that the identified technology would not reduce railroad noise to levels which would meet the proposed standards.

4. Using unreasonably low cost estimates and unwarranted assumptions, the EPA reached erroneous conclusions with respect to the economic and financial impact on the railroad industry and individual railroads.

5. The health and welfare impact assessment overstates the number of people currently affected by railroad noise. The possible reductions in impact are clearly overstated.

-- The methodology employed by EPA artificially created a problem which in actuality does not exist to the degree portrayed by the EPA.

6. The proposed standards, including the measurement methodologies, are replete with technical deficiencies which must be corrected.

II. The Proposed Standards Do Not Meet the Technology and Cost Criteria of Section 17

A. The Technology and Cost Criteria

Section 17 of the Noise Control Act imposes an obligation on the Environmental Protection Agency to adopt only such standards for noise reduction as can be achieved through the application of the best available technology, taking into account the cost of compliance.* EPA defined "best available technology" as:

> ". . . that noise abatement technology or technique available for application to equipment and facilities of surface carriers engaged in interstate commerce which produces the greatest achievable reduction in the noise produced by such equipment and facilities." (44 F.R. 22962)

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* Section 17(a)(1) of the Act reads:

"Sec. 17.(a)(1). Within nine months after the enactment date of this Act, the Administrator shall publish proposed noise emission regulations for surface carriers engaged in interstate commerce by railroad. Such proposed regulations shall include noise emission standards setting such limits on noise emissions resulting from operation of the equipment and facilities of surface carriers engaged in interstate commerce by railroad which reflect the degree of noise reduction achievable through the application of the best available technology, taking into account the cost of compliance. These regulations shall be in addition to any regulations that may be proposed under section 6 of this Act."

The Agency further defined "available technology" as follows:

1. Technology or techniques which have been demonstrated and are currently known to be feasible.

2. Technology or techniques for which there will be a production capacity to produce the estimated number of parts required in reasonable time to allow for distribution and installation prior to the effective date of the regulation.

3. Technology or techniques that are compatible with all safety regulations and take into account operational considerations including maintenance and other pollution control equipment.
(44 F.R. 22962)

These definitions provide that: (a) the technology or techniques must have been demonstrated to be effective in attenuating noise to the degree that the proposed standards (both receiving property standards and point source standards) will be met; (b) the technology or techniques can be applied or implemented successfully; (c) the technology is available on a schedule consistent with the effective dates of the standards; and, (d) the technology must not conflict or work at cross-purposes with safety regulations, operational considerations, and other pollution control objectives. Thus in keeping with EPA's own interpretation of the technology criteria of Section 17, the recommended abatement techniques must pass the tests of:

(a) Effectiveness
(b) Feasibility
(c) Availability
(d) Compatibility.

In assessing the reasonableness of the proposed standards, it is necessary to measure the identified abatement techniques against each of these tests because EPA proposes the adoption of its proposed standards on the underlying and crucial assumption that implementation of these techniques will enable railroads to meet both the receiving property standards and the point source standards.

With respect to the cost criterion of Section 17, the EPA acknowledges that "The Act does not authorize the Agency to set standards at costs that are unreasonable. . . ." (44 F.R. 22963) The EPA thus admits that, as the statute requires, the costs must be reasonable. The question then is whether EPA has used accurate estimates in its calculation of the "cost of compliance", and whether it is reasonable to impose these additional costs on the railroad industry.

B. Receiving Property Standards

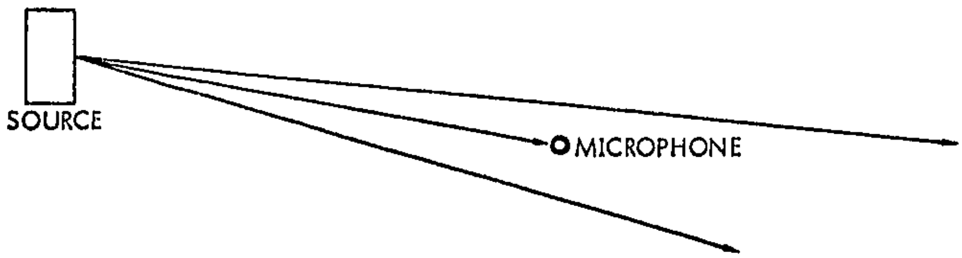
Before entering into the analysis of EPA's proposed abatement techniques, it is necessary to focus attention on an anomaly in the proposed receiving property standards which, if not eliminated, would make the proposals unable to withstand any test of reasonableness. This anomaly, which effectively lowers the proposed receiving property standards, is found in proposed §201.32(b) and §201.33(b) which permit both the L_{eq} and the L_{dn} measurements to be made at a distance of 2 meters from a residential dwelling surface. At that point, reflections from the surface can contribute up to one-half of the total acous- sound level could be up to 3 dB higher than that which would result in a free field situation. Thus for measurements made at such positions, the proposed regulatory levels of L_{dn} 70 and L_{dn} 65 are effectively lowered to L_{dn} 67 and L_{dn} 62 respectively (Exhibit A, pp.9,40-41), as illustrated in Figure 1.

The EPA has gone to great lengths in the Notice and in the Background Document to describe how its analysis of the noise generated by railroad equipment will be decreased to the L_{dn} 70 and the L_{dn} 65 by specific abatement techniques. There is absolutely no consideration of the abatement techniques which would reduce the levels to L_{dn} 67 and L_{dn} 62. Similarly, the Agency has based its cost estimates on the required L_{dn} 70 and L_{dn} 65, not on L_{dn} 67 and L_{dn} 62. This is extremely important when one recognizes that the additional 3 dB reduction in noise levels can only be achieved by a reduction of one-half of the energy generated by railroad noise sources.

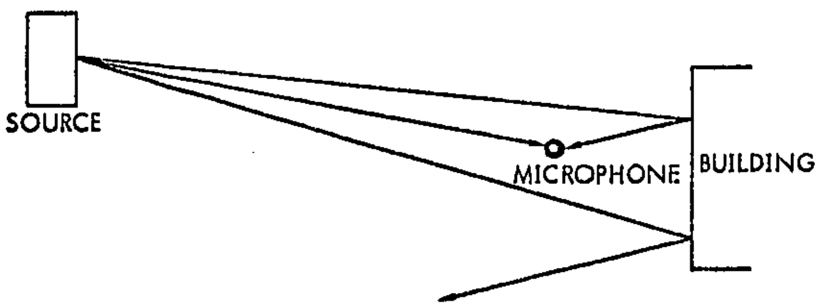
C. The Recommended Abatement Techniques

In discussing the effectiveness, feasibility, availability, compatibility, and cost of the abatement techniques identified by EPA, several relevant factors must be considered. The test data indicate that the railroad noise problem is exceedingly complex. The dominant source varies from point to point along the boundary line of a yard and

FIGURE 1



a. "Free-Field" Condition In Which Microphone Receives Only Direct Sound.



b. With a Reflecting Surface Nearby the Microphone Receives Both Direct and Reflected Sound. In this case, the acoustic intensity measured is typically twice as great as in the free-field situation above, resulting in a sound level that is 3 dB higher.

from time to time at a given point. For example, at a given point, the retarder squeal might control the hourly L_{eq} for a portion of the time, while at other times one of several other railroad or non-railroad sources may control the hourly L_{eq}. (Exhibit A, p.3) Thus, treatment of only one noise source will not enable the railroads to meet the prescribed L_{dn}. Without stating it specifically, the EPA acknowledges that this is true by finding that all of the abatement techniques must be applied to reach the various L_{dn} standards in Tables 4.1, 4.2, 4.3, and 4.4 (44 F.R.22964).

1. Retarder Noise Barriers

In Section 201.16 the EPA proposes that by January 1, 1982, the sound levels for retarders, except inert retarders, shall not exceed an A-weighted sound level of 90 dB at 30 meters from the center line of the retarder track. To meet the point source standard the EPA states that it will be necessary for the nation's railroads to install noise barriers at master retarders and group retarders at all railroad hump yards in less than three years. The EPA assumes that these barriers will effectively reduce the peak sound level generated by retarder squeal to enable the railroads to conform to the 90 dB point source stardard and, when used in connection with other abatement techniques, to meet the L_{dn} 70 dB and L_{dn} 65 dB receiving property standards. The data available to and relied upon by the EPA does not support EPA's assumption. Indeed, an analysis of those data clearly shows that the use of noise barriers around retarders would not achieve the noise reductions required by EPA. EPA could only have reached its conclusions by ignoring or misinterpreting those data. EPA also failed to recognize that in many instances it is physically impossible to erect barriers at existing master retarders and group retarders. At many locations there is not sufficient clearance between tracks or between tracks and structures to permit the placement of barriers. And, as is the case with all of the noise abatement techniques, the EPA grossly understated the costs of barrier installation.

a. <u>EPA Has Substantially Overstated the Effectiveness of Barriers.</u>

In Tables 4.1 and 4.2 and in the supporting text in the Notice, EPA identifies retarder noise barriers as being required in hump yards to meet the L_{dn} 70 and the L_{dn} 65 standards.* EPA also identifies barriers as the only available technology for controlling retarder noise to meet the point source standard of 90 dB at 30 meters. (<u>See</u> Table 5-1, Background Document.) Analysis of the data relied on by EPA and other available data discloses that EPA has grossly overestimated the effectiveness of barriers as a noise abatement technique. Indeed, it is clear that the construction of barriers at retarders in many cases would not reduce noise sufficiently to aid in meeting the receiving property standards, nor would it reduce the noise sufficiently to permit compliance with the point source standard.

With respect to the effectiveness of barriers to reduce retarder noise to meet the point standard, EPA relies on noise measurements taken at Madison Yard operated by the Terminal Railroad Association of St. Louis and at Northtown Yard operated by the Burlington Northern, Inc. In neither instance do the data support EPA's conclusions, and in one case the data clearly contradict EPA's basic assumptions.

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* In Table 4.2 EPA includes ductile iron retarder shoes as also being necessary to meet the L_{dn} 65 dB in 1985, and in the Background Document, it is indicated that ductile iron shoes and lubrication systems are to be used in addition to barriers to reduce the noise emissions from retarders. (Background Document, p. 5-3.) As explained elsewhere in these comments, neither ductile iron shoes or lubrication systems effectively reduce the level of the noise emitted by the retarder. The EPA acknowledges that these techniques do not reduce the level of noise in Table 5-1 in the Background Document.

Based on the tests performed at Madison Yard, EPA asserts that the noise levels were reduced up to 25 dB by the installation of barriers 12 feet high measured from the top of the rail, with the peak of the barriers eight feet on a perpendicular line to the rail track center, Wyle Laboratories analyzed the reports of the noise measurements and concluded that they were not able to confirm the reported insertion loss of up to 25 dB. (Exhibit A, p. 21.) The measurements taken at Madison Yard are inappropriate for use in defining the barrier insertion loss at the measurement position defined in the proposed regulations and do not substantiate the conclusions that barriers would provide a reduction up to 25 dB because (1) there were several inconsistencies in the measurement procedures studied, so that the resultant insertion loss is not representative of a single barrier; (2) there were not enough measurements taken to confirm the data obtained, and (3) the measurements should have been taken over a period of several days to account for the daily variability of the amplitude of retarder noise squeals.

As to the inconsistencies in the measurements, Wyle observes that the data were collected at two measurement points and the results were averaged. At a location 200 yards away from the retarders, there was a reported 18.3 dB reduction. At the second measurement site, measurements were made of the noise generated at Group Retarders 3 and 4. However, Group Retarders 2 and 3 and the barriers constructed there obstructed the line of sight between the measuring point and Group Retarders 3 and 4, and thus the recorded reduction of 36 dB and 31 dB does not represent the actual attenuation which would be provided by a single barrier. (Exhibit A, p. 22.) Simply stated the measurements did not coincide with the measurement locations proposed, and the attenuation measured could not be achieved by the construction of barriers identified as available technology and included in its cost estimates. It was arbitrary at best to imply, as the EPA did in in the Background Document, that the reported 25 dB insertion loss was achieved simply by erection of 12-foot barriers.

The measurements taken at Northtown Yard, referred to in the Background Document at page 5-3 and in Table 5-1, as well as measurements made by the United States Department of Transportation's Transportation Systems Center at Northtown Yard were also analyzed by Wyle Laboratories. (Exhibit A, pp. 23-24.) These data show that the proposed point source standard of 90 dB at 30 meters could not be met even with the installation of a 12-foot high barrier constructed with a 1-foot inner lip designed to prevent noise from "spilling" over the top of the barrier. Even with this 12-foot barrier, the energy average A-Weighted level at 100 feet was 91.3 dB based on a test of 18 cars. (Exhibit A, Table 3-5.) There can be no question but that EPA's proposed point source standard for retarders is unreasonably low since the standard cannot be met even with this elaborate barrier configuration.

With respect to the effectiveness of barriers at retarders in meeting the receiving property standards, the EPA has failed to account for several relevant factors which show that barriers will not materially aid in reducing the L_{dn} levels in the receiving property surrounding railroad yards to the extent claimed.* In this regard it is essential to recognize that generally only the master retarder is situated parallel to the rail property line of a yard. The angle of the group retarders with respect to the property line may vary to a great extent with some pointing toward the receiving property as can be seen in Exhibit B. In such cases, the insertion loss at 90° to the center line of the retarder is not an accurate estimate of the actual loss which will be achieved since at angular positions other than 90° the insertion loss is substantially less than at 90°. A more appropriate estimate would use an energy average of insertion loss at a projected 100-foot distance in a circular area around the barrier. Such a calculation results in an

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* The effectiveness of barriers in reducing L_{dn} levels is an important consideration since retarder noise can be the major contributing noise source during certain times at any given yard. (<u>See</u> Exhibit A, Table 2-2.)

average reduction of only 10 dB. The EPA failed to include this factor in its consideration of the effectiveness of barriers in meeting the L_{dn} standard. Had it done so, the strongest conclusion it could have reached in support of the use of barriers would have been that there are insufficient data to determine if the proposed L_{dn} standards can be met.

Another factor which undermines the conclusion reached by EPA is its failure to consider the actual insertion loss barriers would provide at distances greater than 100 feet. EPA calculates the insertion loss only at 100 feet, and yet the L_{dn} measurements will be taken in many instances at far greater distances. Since the sound diffracting over the top of the barrier will represent a raised source height and since the attenuation provided by ground decreases as the source is heightened, the average insertion loss can be less than 10 dB at distances greater than 100 feet from the barrier. EPA wholly failed to consider this fact.

EPA has the burden of showing that the available technology will actually reduce retarder noise to the degree necessary to meet the standards. It has failed completely to meet that burden.

b. EPA Has Failed to Take Into Account the Feasibility of Barrier Installation

The EPA has not addressed the basic question inherent in installing new structures in an already developed and operating system -- whether there is adequate space or clearance for the installation of barriers in the existing hump yards. EPA ignores this consideration entirely, assuming, without any factual investigation, that barriers can be constructed at all master retarders and at all group retarders. This is simply not possible. See, e.g., Exhibit T. Minimum clearance between the track and a barrier must obviously be maintained to allow the freight cars to pass through retarders. The retarder mechanism itself requires a certain amount of space inside the barrier and adequate space between the barriers at each retarder must exist for maintenance of the retarder and track structure.

Outside clearances are also of vital importance. The installation of barriers on each side of each retarder while maintaining minimum inside clearance would in many instances be impossible because of a lack of room due to the location of adjacent track, retarders, buildings, and communications and signal equipment and structures. In many instances the clearance requirements are controlled by state public utility commissions or equivalent organizations.

The AAR undertook a survey in May 1979 to determine the number of master retarders and group retarders around which there is insufficient clearance to permit the construction of noise barriers. The dimensions of the barriers at Northtown Yard were used as a guide in determining whether there was enough clearance.* The survey (Exhibit C) showed that at

* The barriers used at Madison Yard would require even more space due to their large bases.

least 471 retarders (master, intermediate, and group) or 48 percent of the retarders in the country, do not have enough clearance to permit the installation of barriers. The results of the survey demonstrate that the problem of inadequate clearance is a serious one for the nation's railroads and must be addressed by the EPA before it imposes a barrier requirement across-the-board.

The EPA must also consider the extent to which the physical characteristics of many railroad yards preclude the possibility of installing barriers at retarders. In certain instances, it would be impossible to erect a barrier around a retarder, regardless of cost as would be the case at the Southern Pacific's Englewood Yard at Houston, Texas. In this yard, as shown in Exhibit D, the master hump is located on a bridge which crosses a road and the mainline track, and it would be virtually impossible to erect a barrier there.

c. EPA in Its Background Document and the Notice Has Substantially Understated and Hence Has Failed to Take Proper Account of the "Cost of Compliance."

Because of the capricious manner in which the EPA arrived at the unit costs for barrier installation and because of its arbitrary disregard of other unavoidable costs which would be borne if the railroads were required to install barriers, the EPA has arrived at an unreasonably low cost estimate of barrier installation at master, group, and tangent retarders. At page C-2 of Appendix C to the Background Document, EPA bases its estimate of $75 per linear foot for an installed barrier on the cost estimate contained in its December 1975 Background Document. The EPA has apparently assumed that the cost estimates in the 1975 Background Document included both material costs and installation costs. Actually, the 1975 Background Document identified the costs as being "material costs of initial installation only," clearly excluding the costs of installation. Furthermore, even if it could be assumed that these estimates included both material and installation costs, EPA's selection of $75 per linear foot constitutes an unreasonable and capricious action. In the 1975 document, the barrier costs were estimated to be "$70 to $100 per linear foot." Assuming, arguendo, that these estimates did include material and installation costs, it is beyond comprehension that in 1979 EPA would select $75 per linear foot -- only $5 above the minimum 1975 estimate!

While EPA's use of the 1975 estimates is patently unreasonable, the egregious nature of its error is even more apparent when its estimate of $75 per linear foot installed is compared with the actual costs experienced by Burlington Northern in installing its barriers and when it is compared with the real world cost estimates developed by railroads and material suppliers. Burlington Northern reports that its current-day cost of installing a barrier at its main retarder would be $44,000, or $147 per linear foot installed. Based on information obtained from an established supplier, Southern Railway estimates a cost of $200 per linear foot installed, and this estimate represents only the cost of the barrier material itself, the cost of the concrete foundation, and labor costs for installation of the barrier proper. At $200 per linear foot -- a more reasonable estimate for either new yard construction or in existing yards where clearance is adequate -- a 150 foot-long master retarder would require 300 feet of barrier at an installed cost in excess of $60,000. A 100-foot group retarder barrier set would cost at least $40,000. Using these cost figures and the data on retarders listed in Table 4.3, the most conservative industry estimate of cost for barrier installation would be $41 million for master and group retarders. This should be compared with the EPA's estimate of $14 million.

The $41 million industry estimate is a conservative one since it does not include the substantial expenses which would have to be incurred to install barriers in existing yards where there are clearance problems, including the cost related to necessary track and retarder relocation, rewiring of retarders, and switches; the costs resulting from considerable lost-time interruptions (track days downtime and lost car capacity); and the cost of real estate acquisition to maintain current car capacity. Whereas, in 1975 the EPA at least mentioned such unavoidable costs in its Background Document (although it made no effort to quantify them), in 1979 the EPA totally ignore these costs -- costs which would significantly increase the cost of barrier installation. These costs too must enter into the "cost of compliance" equation, and the EPA would be committing a grave error if it ignored them.

As previously described, many existing retarders do not have adequate clearance for the installation of barriers, making the installation of barriers infeasible. If railroads were actually required to meet the EPA's standards, and if, in accordance with EPA's identification of the best available technology, they were required to install barriers, it would be necessary virtually to rebuild substantial portions of many existing yards.

For example, the Southern Railway has analyzed all of its hump classification yards to determine what the total costs of barrier installation would be, including the costs incurred due to necessary track relocation and retarder relocation, rewiring of retarders and switches, and yard interruption (lost car classification capacity and track downtime). Southern has also evaluated consequent safety and maintenance problems. The results of the analysis are that the total cost of barrier installation for Southern alone is $25.7 million, an amount approximately 16 times greater than the EPA's estimate.* The details are shown in the attachments to Exhibit E. It is readily apparent from

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* This figure represents an estimated $14,556,000 to install the barrier (barrier installation proper and necessary yard modification) and an estimated $11,196,000 related to service interruption. Even if one considers just the cost portion related to barrier installation proper and necessary yard modifications, Southern's estimate is still 11 times greater than the EPA's estimate.

these cost estimates that there is considerably more to barrier installation than simply erecting walls on both sides of a retarder.

In addition, four railroad yards are equipped with a total of 166 retarders which are installed on the classification tracks themselves at a point beyond the group retarder. These are known as tangent point retarders,* and practically all tangent point retarders would have clearance problems. To install barriers at the tangent point retarder (which would be required since Section 201.16 exempts only inert retarders from the barrier requirement) would necessitate relocating all tracks to maintain the minimum clearances between tracks with the barriers in place. For example, at Southern's Inman Piggyback Yard, a 12-track yard equipped with tangent point retarders, it would cost over $6 million for barrier installation**; and these costs do not include real estate acquisition necessary to construct additional tracks to maintain present car capacity.

Santa Fe's Barstow, SP's West Colton, and Chessie's Queensgate Yards average 50 tracks each and are equipped with master, group, and tangent point retarders. These yards essentially would have to be rebuilt. At this time, it would be difficult to estimate the cost of rebuilding these

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* <u>See</u> Exhibit F for an illustration of tangent point retarders in a yard (lower third of photograph).

** This figure includes an estimated $1,638,000 for cost related to service interruption.

yards to permit the installation of barriers; however, based on Southern's estimate at Inman Yard, it easily could cost as much as $25 million per yard.

Other considerations related to barriers which are not addressed by EPA are safety and retarder maintenance, concerns pointed out by Southern in Exhibit E. Barriers adjacent to car retarders subject operating and maintenance personnel to potentially unsafe situations in that the switchman's walkway which would be obscured and the visibility of the adjacent tracks would be obscured. The visibility of the retarders by the retarder operator might also be obscured, thereby hindering the operator's ability to monitor the retarder operation to insure proper functioning. This is particularly true in older yards where retarder towers are located near the group retarders.

Considerable maintenance difficulties would certainly be encountered on account of barrier use, particularly in connection with changing major retarder components such as crossbars, operating beams, etc. Barriers would also introduce unacceptable delays to even routine maintenance jobs and would so complicate heavy repair work as to require complete shutdown of the retarder and a major portion of the class track for protracted periods. Maintenance work on retarders unencumbered by barriers is now performed quickly and with minimal interruption to operations. A comparison of just one major maintenance job, crossbar changeout, illustrates the increased maintenance worktime because of barriers most graphically. Retarder crossbar changeout requires over four hours at BN's Northtown Yard; while, on the Southern Railway, the same task requires 45 minutes or less.

A corollary maintenance problem relates to the renewal of the barrier panels themselves. These barriers must be removable if the railroads are to gain close access to the retarders for maintenance and emergency repair work. The ability to remove the barrier is essential in the absence of specially designed hi-rail repair equipment for retarders. Thus, the railroads, if forced to install barriers, would be more likely to erect barriers similar to those at Northtown than the ones at Madison Yard which are permanently fixed in place.

In summary, the railroad industry contends that the proposed point source standard for retarder noise is improper and unlawful, as it is proposed on the basis of findings and assumptions which are erroneous, do not take appropriate account of the criteria for rulemaking laid down in Section 17(a)(1) of the Act, and will unreasonably burden the railroads and the shipping public. The industry's source data have conclusively demonstrated that the EPA has substantially overestimated the effectiveness of noise barriers and has not shown that the available, "state of the art" technology can meet the proposed standard. Equally important, the EPA has substantially underestimated the costs involved to install such barriers, even at those locations where clearance problems do not exist. If the industry were forced to install barriers at each and every retarder, notwithstanding the inadequate clearance present at approximately one-half of the locations, the projected costs would be even more exorbitant and disproportionate to the benefits obtained. To impose an across-the-board barrier requirement without taking into account the actual degree of effectiveness of barriers, the feasibility of installation, and the cost would be completely irrational. And yet that is what the EPA proposes to do.

2. Switch Engine Treatment

One of the noise abatement techniques identified by the EPA as being necessary to meet the proposed Ldn levels for flat yards and hump yards is "switch engine treatment." (Notice, Tables 4.1 and 4.2) "Switch engine treatment" is further identified as including "Mufflers and Fan Treatment" (Notice, Table 4.3) and "Exhaust Muffling and Cooling Fan Treatment." (44 F.R. 22962) There is no discussion of the effectiveness of this "available technology" other than a brief mention in the Notice of the fact that in flat yards where locomotives are an important noise source the amount of noise reduction technologically achievable is limited. (44 F.R. 22962) The Background Document in Table 5-1 does indicate that a 3 dB reduction can be achieved at idle (referred to as throttle setting 0 in the Background Document) and that a 4 dB reduction can be achieved at throttle positions 1 and 2, but the cited reductions are not substantiated.

Furthermore, there is no discussion in the Notice which indicates that the EPA considered the effectiveness of switch engine treatment within the context of either (1) the relative contribution of noise produced by switch engines in a yard at any given time or (2) the actual noise attenuation achieved by the installation of exhaust mufflers, cooling fan treatment, or engine shielding. Had the EPA made any effort to consider these factors, it would have been compelled to reach the following three conclusions. First, "switch engine treatment" as an abatement technique is a demonstrably ineffective measure for the reduction of railroad noise. Second, it cannot be characterized as the "best available technology." Third, the application of this abatement technique will not result in any meaningful reduction of railroad noise which would materially contribute to the railroads' ability to meet the proposed receiving property standards.

The comments which follow conclusively demonstrate that the recommended noise abatement technology for switch engines is neither feasible, available, nor cost-effective and that the recommended "switch engine treatment" will not obtain the degree of noise reduction which the EPA has estimated, and thus it will not enable the railroads to meet the proposed receiving property standards. Many of the supporting arguments being made here were made by the AAR in its submission to the EPA in the original 1974 rulemaking, which submission is incorporated herein in full by reference. Thus, because EPA has chosen to ignore the realities of muffler retrofit that it was forced to acknowledge in its prior rulemaking proceeding, the AAR is compelled to reiterate what it has already told the Agency on this subject and to provide new supporting test data. That the EPA recognized the infeasibility of retrofitting locomotives in 1976 but would now repropose to retrofit in the absence of any significiant technological breakthrough reflects a "do-or-die" attitude on the part of the Agency, with the industry "to be damned".

At the outset, it is necessary to discuss EPA's definition of the term "switch engines." In Table K-1, Appendix K, page K-1 of the Background Document, EPA distinguishes "Yard Service" locomotives from "Road Service" locomotives and "Road Passenger" locomotives. This distinction is based on data compiled by the Interstate Commerce Commission from reports made by individual Class I railroads to the ICC as to the number of locomotives owned, with the locomotives being categorized as either switcher locomotives or road locomotives because of design characteristics (including size and horsepower) rather than actual operational use of the given locomotive. In apparent ignorance of the fact that road locomotives are often assigned to yard service, usually on a randomly selected basis from the raod locomotive pool, the EPA isolated the switch locomotives from Table K-1 and identified those locomotives as requiring the installation of exhaust mufflers and cooling fan silencers. This oversight on the EPA's part becomes a very relevant consideration in calculating the actual cost of compliance to retrofit locomitives in switching service as well as in demonstrating the ineffectiveness of the proposed retrofit.

A very important consideration which the EPA failed to address in assessing the presumed effectiveness of switch engine retrofit is the extent to which switch engines are represented in the total population of locomotives in a yard at any given time. The EPA has completely ignored the fact that locomotives engaged in switching operations in a yard represent only a fraction of the locomotives actually present in a yard. At any given time, the locomotives engaged in switching service in most yards of any size are far outnumbered by road locomotives in through trains, road locomotives included in the power consist of arriving and departing trains, road locomotives being serviced, fueled and repaired or those awaiting service and repair and road locomotives awaiting assignment. Thus even if all locomotives assigned to switching service were retrofitted with exhaust mufflers and modified cooling fans, there would only be a de minimus reduction in the noise produced by locomotives in a railroad yard.

Equally important, the EPA has also overlooked the fact that the locomotives assigned to switching service at any given time include road locomotives assigned at random on a daily or hourly basis to switching operations. Thus, it is not just "switch engines" which provide yard switching service. In fact on any given day approximately 50% of the locomotives in switching service are road locomotives assigned to yard service.*/ Therefore if one assumes that the EPA intends to impose retrofit

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*/ This figure is based on a survey conducted by the AAR of its member railroads to determine how many road locomotives were in use as switcher on a typical day. The day selected was May 15, 1979. According to the survey results, on that day 59 railroads had 3,598 road locomotives assigned to switching service in addition to 3,614 switch engines. This ratio is roughly 50%.

requirements just on those switch engines characterized as such in the railroad reports to the ICC, the application of the EPA's recommended technique would obviously affect even a smaller portion of the locomotives in a railroad yard.

These omissions on the part of the EPA call into serious question the effectiveness of the EPA's recommended abatement technique for switch engines (whether as narrowly construed by the EPA or as more logically applied based on actual operational use of equipment) from the standpoint of the relative contribution of noise produced by switch engines in a yard at any given time. Even more significantly, as is discussed at length below, the EPA has not demonstrated that retrofit is feasible or effective from a technical standpoint, thereby enabling the railroads to meet the proposed receiving property standards. The evidence is to the contrary.

a. Retrofit of Mufflers on Existing Diesel Locomotives is Infeasible Under the Best Available Technology.

In Table 5-1 in the Background Document, EPA assumes that exhaust muffling and cooling fan treatment will reduce switch engine noise by 3 dB at idle and by 4 dB at throttle positions 1 and 2. (Background Document, p. 5-11) Actual tests show this is simply not true. The Electro-Motive Division, General Motors Corporation (EMD) conducted tests on two switcher locomotive models currently produced by that company. The results of these tests are shown in Exhibit G. For model MP 15 AC the sound level was not reduced with the installation of a muffler (referred to in Exhibit G as a "silencer"*/) at "Low Idle", "Idle", or at "Throttle Position 1". At Throttle Position 2 there was a reduction of only 1 dB. Similarly, for model SW 1001 the installation of a muffler did not reduce the noise levels at Idle or Throttle Position 1 and only reduced the noise level at Throttle Position 2 by 1 dB. These results were produced from actual tests with the measurements made 100 feet to the side of the locomotive during a stationary load test.

It can only be assumed that the EPA based its estimates of noise level reduction on a study which was prepared for the U.S. Department of Transportation. (Exhibit A, p. 18) However, no actual measurements with a muffler were performed in connection with the DOT's study, and the expected noise reductions were merely calculated. Based on those unsubtantiated calculations, the DOT's study concluded that the noise reduction achievable with the installation of a muffler would be 3 to 4 dB at idle, 4 to 5 dB at throttle position No. 4, and 2 to 3 dB at throttle position No. 8. By coincidence, one of the locomotives used in the DOT study was also the subject of noise measurements in a study performed for the AAR in which actual noise measurements were made. This was an EMD SD 40-2, which is

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*/ The "silencer" is the new technique being employed by the EMD in compliance with the 1980 noise standard for new locomotives.

a road locomotive with much greater horsepower than an ordinary switch locomotive. The results of these measurements showed that the installation of a muffler reduced the noise by only 1.5 dB when the locomotive was at idle. In contrast to the theoretical calculations, the actual measured results on exhaust noise silencers showed little or no noise reduction in the overall level for idling locomotives. (Exhibit A, p. 18-19)

Another relevant consideration as to the effectiveness of switch engine treatment is the extent to which switch engines are at idle and lower throttle positions. According to the EPA's "Background Document for Railroad Noise Emission Standards, December 1975" (EPA-550/9-76-005), at page 5-10, switcher locomotives are at idle oı in the first or second throttle position 92% of the time. An excerpt from Table 5-10 is set forth below for the Agency's convenience.

Percent of Time at Throttle Positions -- Switchers[1]

Throttle Position	Percent of time
Idle	77
1	7
2	8
3	4
4	2
5	1
6	--
7	--
8	1

*/ EPA Background Document for Railroad Noise Emission Standards, December 1975, EPA-550/9-76-005, Excerpt from Table 5-10, p. 5-10.

In view of the "real" evidence which shows that there is no reduction or very little reduction in noise for locomotives (both "switchers" and road) at idle or throttle positions and the fact that switch engines are at idle or low throttle positions approximately 92% of the time (a percentage equally applicable to raod locomotives performing switching service), it is clear that the use of mufflers on switch engines will have little or no measurable effect on property line sound levels.

With respect to cooling fan treatment, the study prepared for the Department of Transportation and referred to above revealed that cooling fan noise levels at idle were 3 dB lower than those from the engine alternator and were too low to permit diagnostic measurements. The study further showed that fan noise becomes only the second most significant noise source at the higher throttle positions (Nos. 4 and 8). (Exhibit A, p. 21) The practically non-existent effect of cooling fans on noise levels is also demonstrated in Exhibit G, a noise measurement study conducted by the Electromotive Division of General Motors (EMD). For the MP 15 AC switcher, although the fan operation can be controlled, the fact is immaterial since there is no difference in sound levels with the fan on and with it off at the idle position. A similar finding is true with respect to the SW 1001 model. On that model the fan is belt-driven and continuously operating, and the radiator shutters can be opened and closed. At idle, there is no difference between noise levels with the shutters in the open or closed position. Both the DOT and the EMD studies support the conclusion that little, if any, benefit would be achieved in reducing overall noise levels at idle by fan noise treatment. There are no studies supporting a contrary position to the railroads' knowledge.

Similarly, engine casing noise is found not to be a dominant source at idle. Thus engine shielding would not provide much reduction to the noise emission at idle. Also, EMD has advised the AAR that engine shielding as a means of noise reduction is extremely impractical from an operating standpoint. Placement of insulation materials inside the engine compartment may perhaps reduce noise reverberation inside the compartment, but would not last long due to oil and dirt buildup. Noise escapes from so many other areas of the locomotive that it is unlikely that insulation would have any significant effect on the overall sound level emitted by switch locomotives either at the idle or lower throttle positions. The AAR does not know of any data and the EPA has not shown any which demonstrate that engine shielding can reduce the noise levels of switch engines at the lower throttle positions.

In essence, the EPA has not demonstrated that any of the technology which it recommends (muffler retrofit, cooling fan treatment or engine shielding) is either feasible or available or will result in any appreciable reduction of noise from switch locomotives in a manner which would contribute to the railroads' ability to meet the proposed receiving property standards. It would be eminently unreasonable to require the physical retrofit of switchers which represent only a fraction of locomotives in a yard at a given time just to obtain little, if any, noise reduction for 92% of the time when they are operating.

b. <u>EPA in its Background Document and the Notice has substantially understated and hence has failed to take proper account of the "Cost of Compliance".</u>

The EPA has substantially understated the costs of retrofitting switcher locomotives. According to the Electro-Motive Division of General Motors Corporation (EMD), the costs to retrofit exhaust mufflers to switch locomotives today are comparable to the costs reported in Appendix E in the EPA Background Document for Railroad Noise Emission Stndards, December 1975, on Page E-46*/, except that those costs must be adjusted for inflation. However, the method of exhaust muffling as recommended by EMD has changed slightly. Experience gained by EMD in the development of noise abatement methods designed to comply with the 1980 locomotive noise standard has resulted in a modified exhaust manifold which combines with the muffler. Earlier recommendations called for an add-on type muffler that proved to create additional exhaust back pressure and increase fuel use which rendered that approach infeasible. The 1979 installation cost is estimated to be $20,880 as shown in the following table.

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*/ The total unit cost of muffler retrofit was estimated at that time to be $16,300.

Switch Locomotive Retrofit of Silencing Manifold

Adjusted for Inflation[1]

Hardware - Major[2]	$ 7,100
Hardware - Misc.[2]	480
Labor[2,3]	5,300
Total Capital Cost	$12,880
Out of service - Plant[2]	6 days
Out of service - Transit[2]	4 days
Out of service - Cost/Day	$800[2]
Total Locomotive Out of Service Cost	$ 8,000
Total Cost	$20,880

The Interstate Commerce Commission Report on the Operating Statistics of Class I Railroads lists 5,870 yard switchers at the end of 1978. To this must be added the approximately 1,105 locomotives

1 Inflation adjusted at 10 percent annually.

2 Source of base cost figures is General Motors Corporation "Locomotive Exhaust Muffler Retrofit Cost Study Report No. 2" transmitted to EPA on November 15, 1974, as reported on page E-46 of the "Background Document for Railroad Noise Emission Standards," December 1975.

3 Labor estimate based on discussions with Mr. J. K. Valus, EMD Engineering Department, on May 14, 1979.

owned by switching and terminal companies and other small railroads. Of these switcher-type locomotives, at least 860 are older locomotives manufactured by Alco, BLW, GE and others. The cost of installing exhaust silencers would probably be considerably higher than the figure applicable to the EMD switchers because EMD parts are not interchangeable with these other models. To develop an industry cost, however, the AAR has conservatively assumed that the cost would be $20,880 for all switcher locomotives. Thus, the total industry cost to install exhaust silencers on yard switcher-type locomotives (as characterized in the ICC reports) is estimated to be $145.6 million.*/ Annual muffler maintenance costs are conservatively estimated to be $2,000 per unit, or an annual total of $13.9 million for all of the locomotives involved.

As previously discussed, not all locomotives in yard switching service are actually switcher-type locomotives. The locomotive needs of a yard are also met by drawing from the road locomotive fleet. If the EPA intended that all locomotives used in yard service would have to be retrofitted, which logic would seem to dictate in view of the EPA's overall objective to reduce yard noise, the railroad have three options: (1) to buy new switcher locomotives with mufflers installed to replace the

*/ This estimate consists of capital costs of $89,800,000 and locomotive out of service costs of $55,800,000.

the road locomotives now randomly assigned to switching service, (2) retrofit the required number of road locomotives, assign them permanently to switch service, and then buy additional road locomotives to replace the lost power in the road locomotive fleet or (3) retrofit the entire road fleet. Each of these alternatives is preposterous and would cut heavily into the industry's scarce capital resources. Calculations based on those totally unacceptable alternatives are made below for a single yard, a single railroad system, and the entire industry. These calculations are made to document the tremendous amounts of money which would have to be incurred if all locomotives in switching service had to be retrofitted with mufflers.

One Yard Situation

At Chessie System's Cumberland, Maryland hump yard, no switcher-type locomotive is assigned to the yard. There are five road locomotives (SD-7s and SD-9s) permanently assigned to switching at this yard. Additionally, six GP-7 or GP-9 units are taken at random for use in Cumberland. If mufflers were required to be installed, Chessie advises that it would be necessary to have a total of 14 road type locomotives retrofitted and permanently assigned. This includes the 11 road units normally in yard service and 3 backup units to allow for repairs and maintenance. To make up for the horsepower loss to the road fleet of the 3 additonal units, 2 new GP-38 locomotives would have to be purchased. Thus, the total cost of the action at Cumberland Yard alone would be:

Apply mufflers to 14 locomotives	14 X $37,000*/	= $518,000**/
Purchase 2 GP-38 locomotives	2 X $505,000	= $1,010,000
TOTAL		$1,528,00

A Single Railroad System

According to the AAR's survey mentioned on page 35, Southern Railway System had 166 road locomotives assigned to yard switching service on May 15, 1979, in addition to 189 switch engines. Southern's total road locomotive fleet consists of 813 units, of which 354 units are six axle locomotives which would not be assigned to yard service. If the third approach listed above is applied, i.e., retrofit of the entire fleet (except for, in Southern's case, those units which it would not assign to yard service***/, Southern estimates that its total costs would be approximately $21 million.****/ While this approach would preserve the pooling system and avoid the necessity of buying additional locomotive power, the expenditures involved are clearly disproportionate to the minimal or non-existing benefit obtained through retrofit.

*/ The average silencer cost for a road unit is estimated at $37,000. This is developed from the EMD muffler study presented in the 1975 Background Document, Appendix E.

**/ This includes $112,000 locomotive out-of-service cost.

***/ Railroads differ as to which types of road locomotives may or may not be assigned to yard service.

****/ This calculation is based on 189 switch engines times the estimated unit retrofit cost of $20,880 (for switchers) plus 459 road engines which could be assigned to yard service from the road locomotive pool times the estimated unit retrofit cost of $37,000 (for road locomotives).

Industry-Wide

Employing the second approach would require the retrofit of approximately 3,600 road locomotives typically assigned to switching service. These units would then be assigned to dedicated service at individual facilities so as to utilize their muffler feature to its greatest extent. As in the Chessie's Cumberland Yard for example, additional locomotives would have to be withdrawn from road service to serve as backups to the dedicated yard power. Taking into account the fact that some companies with relatively small locomotive fleets would retrofit all units with silencers and that larger companies would not, a factor of .25 is applied to the dedicated road units to estimate the number of backup units required on an industry-wide basis. Thus, 900 additional locomotives would be withdrawn from road service and equipped with silencers to serve as backups to yard power. To maintain the current level of road power, additional locomotives would be required. Since the railroads tend to relegate older, lower horsepower locomotives to yard service as new, higher horsepower units are obtained, fewer than 900 units would need to be replaced. The Chessie System used a .66 factor to determine additional new power needs to replace the power lost to dedicated service in Cumberland. As a conservative measure, the AAR has applied a factor of .50 to the industry. Thus, the industry would need 450 new locomotives. At an estimated $600,000 per unit, the cost for the new equipment would be $270 million.

The total cost of the action then would be:

$166,500,000*/	for muffler installation on 4500 road locomotives**/
270,000,000	for 450 new road locomotives
145,600,000	for mufflers on switch engines
$582,100,000	

This compares to the cost of installing mufflers on all locomotives at a cost of about $845 million.

In Summation

It must be restated that the noise abatement technology purported by EPA to reduce the sound levels of yard switchers will have little or no effect on the property line sound levels. Mufflers do not attenuate exhaust noise at throttle settings one and lower and yard switchers are at those settings most of the time. Also, yard switchers do not constitute the only locomotive noise source in a yard. Road units are used for switching with regularity. EPA does not address those situations either. It would be extremely unreasonable for EPA to impose a standard on the industry based on its finding that such standards could be met by the implementation of the recommended abatement techniques

*/ Includes $36,000,000 out-of-service cost.

**/ The average silencer cost for a road unit is estimated at $37,000. This is developed from the EMD muffler study presented in the 1975 Background Document, Appendix E. This includes $8,000 out-of-service cost per locomotive.

when the EPA has failed to analyze adequately the available data holding to the contrary. Even a preliminary review of the material contained in the 1975 Background Document would have disclosed that retrofitting switch locomotives with exhaust mufflers, cooling fan silencers and engine shielding would not constitute an effective abatement technique. It is not the "best available technology" and under no stretch of the imagination can the costs of compliance be viewed as reasonable given the fact that the recommended abatement technique would not enable the railroads to comply with the proposed receiving property standards. If implemented, locomotive retrofit would serve only to bankrupt the marginal railroads and lead the healthier railroads quickly down the same path.

3. Relocation or Shutdown of Idling Locomotives

The EPA has identified the relocation or shutdown of idling locomotives as an abatement technique necessary to meet the 1982 and 1985 receiving property standards at all yards and facilities across the country. EPA gives the impression that relocation or shutdown is a logical and simple abatement technique. It is not. Mechanical, operational, and yard design factors preclude such actions at most locations and, even where relocation or shutdown could be used, the costs are prohibitive.

The E' ^ proposal displays a lack of familiarity with railroad equipment, with the realities of railroad operations, and with the character of railroad yard design and use. To the uninformed observer, shutting down idling locomotives may well represent the most logical method of locomotive noise reduction. However, an understanding of the mechanical characteristics of diesel locomotives discloses the fallacy of this too simple solution. A railroad locomotive is not just a larger equivilant of a passenger automobile, and stopping and restarting a locomotive is not the simple procedure we are all familiar with in the daily operation of our private automobiles.

Locomotives which have been inoperative for any period of time at all are subject to the possibility of severe damage caused by a hydraulic lock on restart. Because of the extreme expansion and contraction of the various mechanical parts of a locomotive diesel engine, cooling water is able to leak into cylinders when the engine is not running. If water is present in a cylinder when the engine is started, that water will not compress as does air, and some part will fail on the compression stroke, usually the connecting rod. Since the locomotive will no doubt start, running on its remaining cylinders, the broken connecting rod will likely cause more serious damage, such as being expelled through the block or oil pan, or damaging the crankshaft, before the engine is stopped. Whatever the extent of the damage, the unit must be taken out of service and be moved to a repair facility for overhaul or total replacement of the engine. A hydraulic lock can occur in as little time as a one-hour shutdown.

In addition to the risk of damage from hydraulic lock on startup, the lubrication requirements of the locomotive must be considered. Because of the looser tolerances required in diesel locomotives and the extreme working pressures generated between the various metal surfaces, locomotives use a simple grade 40-weight oil; and this cannot be replaced with a lighter or multiweight oil. Due to the high viscosity of 40-weight oil, a cold diesel engine can only be restarted at ambient temperatures of 45-50 degrees Fahrenheit or greater, according to the Electromotive Division of Genral Motors, the largest U.S. supplier of locomotives. Further, when a locomotive sits cold for a long period of time (24 hours or more), the engine bearings must be lubricated prior to restart to prevent scoring and other damage. Such prelubrication consists of connecting an outside power source and pump to an engine lubrication port and circulatinng the engine lubricant or injecting new lubricating oil. Together, prelubrication and hydraulic lock precautions require two mechanical employees and one-half to one hour's work. After start, warmup prior to placing the locomotive under load is another one-half to one hour delay.

Another factor which precludes shutdown at many locations is the fact that locomotive cooling systems do not use anti-freeze protection since anti-freeze solutions are not compatible with engine lubricating oil, and coolant leakage, again caused by required loose tolerances, will adversely affect the oil and result in engine damage, particularly damage to engine bearings.

General Motors-Electromotive Division has developed a system to allow an engine to be shut down which allows it to be restarted without damage to the engine. However, this system is presently available only on new passenger locomotives of the F-40 series at an added cost of $16,000 to $20,000. Included in the system is a 24 KW electric water heater; circulating pumps for lubricating oil and cooling water; a specially designed oil cooler that alternately acts as an oil heater and does not allow the oil to drain back into the crankcase; a trickling charger for the batteries; electric cab heat; a "creepy crank" or purge control which slowly turns the engine over and, if a piston encounters a hydraulic block, its increased pressure is signaled to the starter which immediately stops, thus preventing engine damage; and a "train line" wiring feature which allows multiple unit operation. To operate this system, 440 V, 400 amp (for operation with up to eight units), 3 phase power must be supplied from outside. The "creepy crank" can only be installed in the F-40 series locomotives with AC generators. All other engines must be hand-cranked to check for hydraulic pressure. Compression relief valves are provided on all model EMD engines. These valves can be opened to drain the cooling water out of the cylinders while hand cranking.

Such a system will provide some degree of protection against engine damage in shutdown and startup situations. However, with or without a protective system, the startup task will take the better part of an hour. In addition, such activities will require the use of additonal railroad mechanical personnel because the provisions of the collective bargaining agreements with the unions prevent the engine crew from performing that task.

No definitive study of the increased manpower costs to the railroad industry associated with shutdown and restart of locomotives has been undertaken due to the short time allowed in the comment period. However, if every such stop-start cycle consumed only one hour total, including the required warmup, it obviously would be a substantial expense even without the inevitable problems in less than ideal situations. When one then considers potential for engine damage, operational costs resulting from restart failures, congestion resulting from inability to move shut down locomotives and with the present state of technology, an absolute prohibition on open yard shutdown on account of weather conditions in many parts of the country over a significant portion of each year, it can be readily seen that engine shutdown is not the easy fix that it seemed at first glance.

The relocation of idling locomotives might also appear to the uninformed observer to be a logical method of reducing noise levels at the receiving property. Indeed, where the effect of noise from idling locomotives on surrounding property can be diminished, every effort is made to do so. However, the possibilities for relocation of idling locomotives are severely limited. In small yards there is simply no possibility of relocation. In the attached statement of Mr. R. A. Drengler of the Chicago & Northwestern Transportation Company (Exhibit H), the impossibility of relocating idling locomotives in a small yard is explained. C&NW must store its commuter trains with idling locomotives at various yards throughout the Chicago Metropolitan area in order to provide efficient passenger service. At its Barrington, Illinois yard, with only three tracks, it is necessary to store overnight three trains including three locomotives which cannot be shut down when the possibility exists that the temperature may fall below 40° Fahrenheit. While the locomotives meet the existing point source standards applicable to locomotives, the noise from this yard will undoubtedly violate the proposed receiving property standards because of the noise generated by these locomotives.*/ Yet, there is no available yard for relocation, and the yard itself could not be relocated without serious disruption to the railroads commuter operation and at tremendous expense. Barrington Yard is representative of hundreds of small and confined rail yards throughout the country that simply have no space physically to relocate idling locomotives.

At larger yards, it might appear that the railroads have more alternatives for relocating idling locomotives but that is not usually the case. Railroad yards represent substantial capital investments in land, equipment, and structures and are carefully designed to permit the fast and efficient receipt, classification and departure of cars. Receiving tracks, classification tracks, departure track, ready tracks are all located for efficient train and car handling. In addition, car repair facilities, diesel repair shops, and locomotive fueling and servicing facilities are positioned to optimize the efficient use

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*/ Thus, in effect, the proposed receiving property line standard levels would negate the current standards, an anomaly which cannot be ignored.

of these facilities and to minimize or avoid interference with car classification and train movement. Each facility and each track has its designated functions, and the yards are designed to efficiently coordinate those functions.

A graphic illustration of the many difficulties which would be contronted at a major hump yard facility in trying to relocate idling locomotives is the Burlington Northern's Northtown Yard. (Exhibit I is a drawing of that Yard.)

At Northtown, idling locomotives are located in the vicinity of the diesel repair shop which is identified on the drawing. They are found on the tracks marked DSS 1 through 7, south of the diesel repair shop and on other tracks on the north, west and south sides of the diesel repair shoop. The locomotive washing facility and the locomotive fueling and servicing facility are in this area, resulting in the virtual continuous presence of idling locomotives in that specific area. Examination of other locomotives in that specific area. Examination of other to specific purposes and the presence of locomotives would seriously interfere with the activities currently conducted on those tracks. For obvious reasons, the locomotives cannot be stored on the classification tracks and there is no "middle" of the yard to which these locomotives can be moved.

Relocation of idling locomotives to any other areas of the yard shows that the other tracks are devoted area near the property line would simply result in the shifting of the noise source to a point where it would have an impact on the receiving property near or adjacent to the new location. It is not an effective solution. Furthermore, such relocation would seriously interfere with the activities for which the tracks at the new location were designed. For example, on the west side of the Northtown Yard, the departure tracks (marked DEP 1 through 6) are bordered by the "Main Line" and the "South Running" track, both of which are used for through tracks. The departure tracks must be kept available for and are occupied by trains which have been made-up while awaiting departure. Similarly, on the east side of the yard, the departure tracks (marked DEP 7 through 9), which extend from the tangent point of the classifiction tracks northward past the east side of the diesel repair shop, are similarly dedicated tracks. As can be seen on Exhibit I, relocation of the idling locomotives to these tracks would actually place them closer to the receiving property.

The tracks in the vicinity of the car repair shop are not available for locomotives. The movement of cars into and out of the car repair shop and the actual repair activities on the tracks marked RIP 1 through 9 preclude the use of the tracks for the storage of idling locomotives.

Not shown on Exhibit I are the receiving tracks located to the north of the tracks shown. The receiving tracks lead into virtually all of the tracks shown on Exhibit I and are functionally comparable to the classification tracks. They must be available for incoming trains and the movement of cars into the classification, departure, or repair tracks; locomotives to the repair servicing, or fueling facilities or to trains awaiting departure; and cabooses to the caboose servicing facilities. Thus, the receiving tracks are virtually in continuous use.

The situation at Northtown Yard which makes it virtually impossible to relocate idling locomotives is typical of major yards in general and hump yards in particular. Northtown conclusively demonstrates that relocation of idling locomotives is not a viable noise abatement technique. At best that technique can only be applied in special limited circumstances where space and logistics permit.

The EPA Background Document places great émphasis on the reduction of locomotive idling as a noise abatement technique. It does not adequately define what is meant by the term "idling locomotive." In major yards, such as Northtown, locomotives in proper working order which have been serviced and fueled are generally dispatched through "ready tracks" as part of the power consist of departing trains. Some idling is involved but it is of relatively short duration because of the continuous need for power. Locomotives which must be repaired, serviced, or fueled are necessarily located in the vicinity of the repair, servicing, or fueling facility. Some significant delays can be experienced at each of these points but shutdown and startup at each location would not be possible and relocation, in addition to the problems discussed above, would only generate more yard activity and result in more noise generation. Switch locomotives (those not in use in road service) are either operating or are at idle throughout the yard throughout the day. They cannot be considered idling locomotives in the same sense as those locomotives awaiting service, repair, or fueling since they represent a part of the actual transportation movement through the yard. Their movement to so-called acceptable idling areas within the yard would only result in additional non-productive movement and add to congestion without noticeably reducing total noise emanating from the yard.

It is true that in certain instances, locomotives not in service can be shut down under controlled conditions. It is also true that in isolated circumstances idling locomotives can be relocated. However, to the extent that compliance with the 1982 and 1985 receiving property standards depends on techniques of shutdown and relocation of idling locomotives as generally applicable abatement technique throughout the country, those standards cannot be met. As indicated at the beginning of this section, EPA believes idling locomotives to be a major contributor to railroad noise, and in that the AAR concurs. Locomotive power, together with the railroad track structure, is the essence of rail transporation. To suggest that the solution to railroad noise is to shut down locomotive power or to relocate that power away from those areas where it is operationally needed, is not responsible regulation of railroad noise.

4. CAR COUPLING STANDARD

The EPA identifies car-coupling noise as a significant noise source in railroad yards and in Section 201.15 proposes the adoption of a point source standard which would limit car coupling noise to 95 dBA measured at 30 meters. The "technology" EPA identifies as being available and necessary to achieve this level is "speed control" which EPA translates into car impact speeds limited to 4 miles per hour or less. While establishing a maximum limit of 95 dBA at 30 meters, the EPA provides that the 95 dBA requirement will be waived for car impacts where it can be demonstrated that the speed of the car at the point of impact was 4 miles per hour or less.

While there is a direct correlation between speed and noise, the EPA commits a grave error when it presumes that speed control is the answer. "Speed control" is not a technology; it is an objective to be achieved by application of appropriate technology. To suggest that certain noise levels can be achieved by "speed control" without identifying the technology which might be available to control the speed of cars in the process of classification reflects faulty logic. Without any investigation of the circumstances affecting speed of cars or possible methods of controlling speed of cars, the EPA simply imposed a "speed limit" on cars in the classification process. It is naive, at best, to conclude as EPA did that, because car impact noise can be attenuated by maintaining a speed of 4 miles per hour or less, therefore a 4 mile per hour speed limit constitutes the best available technology. It is clear beyond a doubt that EPA did not consider or identify any available technology or abatement techniques the application of which would enable railroads to meet the car coupling noise standard by means of "speed control."

That this in fact was the case is evidenced by the very manner in which the EPA derived the proposed standard. First, the EPA, acting on railroad-supplied information which it misapplied (as will be discussed later), concluded that a 4 mile per hour coupling speed guideline had been adopted as a generally accepted "best practice" by rail carriers to prevent damage to cars and freight alike. Next, it undertook a very limited series of experiments designed to ascertain the noise levels emitted by car couplings, a study designed to ascertain the noise levels emitted by car couplings at low speeds and, in particular, at speeds at or below 4 miles per hour. Instead of measuring coupling speeds under actual operating conditions, the EPA's study was carried out at a special test site under tight control conditions. The study itself was comprised of measurements of only 34 couplings. On the sole basis of the results of these experiments which indicated that the noise levels of car impacts at speeds at or below 4 miles per hour do not exceed 95 dB, the EPA selected the 95 dB standard as an "appropriate" point source standard for car couplings.

Because of the EPA's failure to make any assessment of the extent to which the 4 mile per hour car coupling speed is a realistic speed limit and is actually attainable by the railroads and because of its failure to investigate the technology of "speed control," its selection of the 95 dB requirement was completely arbitrary. To give some credence to the proposed car coupling standard, the EPA erroneously concludes that the standard "essentially codifies existing general practice and thus should result in no additional cost to rail carriers." (44 F.R. 22965) The comments which follow seek to make the EPA aware of the fallacy of this statement and the dangers inherent in its proposal.

The 4 mile per hour car coupling objective has been in railroad lore for so long that its origin has been obscured. One of the better explanations is that in the old days a switchman was told to couple the cars "at 4 mph, or a 'brisk walk'". There is no underlying scientific support for the 4 mph figure. Railroad mechanical officers offer the suggestion that the 4 mph speed relates to equipment capacity. Operating personnel indicate that 4 mph is the maximum safe speed at which trainmen should board or alight from moving freight cars. Damage control officials view the 4 mph speed as an objective to protect lading from damage. However, as noted above, in the real world of railroading, cars are often coupled at greater speeds for reasons set out below. Any attempt to slow all cars to this exact speed, even if it did not result in the need to shove-to-rest (a totally unacceptable prospect) or in coupling failures, would create a slowdown in operations which would lead to yard congestion and a breakdown of railroad transportation in this country.

Examples of difficulties in achieving precise coupling speeds in certain types of railroad yards follow:

<u>Flat Yards</u>

Flat yard switching is performed by locomotives. In general, the switching and classification procedure begins with a train entering the receiving yard for the purpose of reclassification. The road locomotives and caboose are removed for servicing. A switch locomotive pushes the string of cars towards the classification yard. A brakeman uncouples the first car and the locomotive increases its speed to a point where the brakeman feels the car will, when released, travel through the switches and down the prescribed track to couple with the closest car on the track at a reasonable speed. The brakeman signals the engineer who then brakes the train, thus releasing the car. In other words, the process is entirely judgmental on the part of the brakeman and the engineer who can only rely on experience to gauge the speed requirements for each car for each situation. The final speed at coupling is governed by a variety of conditions such as weather, condition of the equipment, weight of each car, distance of travel and so on. There is no way to control the final speed of impact with the precision demanded by the proposed standard.

Present Car Coupling Speeds - Flat Yard

Since the flat switching function involves such subjective judgment regarding car speed, coupling speeds must vary from time to time at any facility, depending on the experience of the people involved and the conditions under which they are working. Examination of the data presently available identifying coupling speed measurements in flat yards found that 71 percent of the couplings observed occurred at speeds of 4 mph or less in the course of an "experiment" in 1969. The conditions under which these data were collected were not normal but were tightly controlled since the couplings were being observed on a special "Careful Car Handling - National Observer Day." Thus a specific effort was made to concentrate on impact speeds as an isolated event in the classification process. No attempt was made to measure the additional time the actual operations consumed.

A more realistic estimate of the percentage of cars coupled at 4 miles per hour or less would be 40 percent. In a study of 1568 car impacts (not all at flat yards) over a three-month period in 1950 it was found that only 36 percent of the total number of impacts (at both hump yards and flat yards) occurred below 5 miles per hour. The results of that survey were similar to the results of a recent study on Conrail which showed that only 35.8% of 15,192 cars were coupled at speeds of 3.9 mph or less.

Hump Yards

The classification operations of a hump yard are unlike those of a flat yard since the yard is designed to use gravity in sorting the cars. Generally, an inbound train arrives in the receiving yard and, after mechanical and air brake inspection, a switch engine pushes the cars to the hump lead and over the hump crest. At the crest, a brakeman uncouples each car which is then allowed to roll freely down towards the classification yard. The classification yard is usually organized into groups of 6 to 9 classification tracks. This pattern is used in part because it requires fewer retarders for speed control.

Judging the speed necessary for a car to roll from the crest to point of impact with another car in the classification yard is a continually evolving science. Many factors must be considered in setting the speed, including weather conditions, wind resistance, rollability of the car, mechanical conditions such as bearing equipment, car weight, distance to travel and others. Older yards have manually operated controls and rely primarily on the operator's judgment. As the technology has developed, automatic and computer operated speed control has become more finely tuned. The very newest yards aim for an essentially "hands off" operation. Yards are distributed about evenly among manual, pushbutton, and computerized operations. Due to the nature of hump yard configurations and concepts, there is no way these yards can meet the standard as it is proposed.

Present Car Coupling Speeds - Hump Yard

Data specifically concerning car coupling speeds in hump yards are available in the form of results of the AAR "Careful Car Handling - National Observance Day" in 1969. A total of 3949 events were measured with 2038 or 52 percent falling into the range of 4 mph or less. By comparison, Southern Pacific's West Colton Yard, a new highly automated facility produced results of 88 percent at 4 mph or less. It should be pointed out that in 1969, computerized speed control was not developed to the extent it is now so the nationwide ability to achieve a 4 mph coupling speed might be somewhat higher today. However, the unreasonableness of EPA's proposed standard and speed limit is readily apparent when considered in light of the fact that the four mile per hour speed is only achieved 88 percent of the time at West Colton Yard which is equipped with a computerized cresting system that provides for a high cresting rate and controlled low coupling speeds. This system includes the use of master, intermediate, group and tangent point retarders. The computer system controls the speed of the car by activating these retarders based on rollability of the car (including windage), weight of the car, and distance to travel. Only a few of the most modern hump yards have this technological capability to control car speed.

Railroads have more than ample reason to keep car coupling speeds at a practical minimum for coupling consistent with the physical necessities of actual coupling the cars. The underlying reasons for seeking low speed impacts are, of course, safety, equipment protection and to protect the lading in the cars as well as the cars themselves. Railroads must respond financially for merchandise damaged due to overspeed impacts.

On the other hand, failure of cars to couple on impact has even more dire consequences. First, it leads to delay while recoupling is attempted; second, and perhaps more important, it leads to a potential threat to safety and a possible violation of the Safety Appliance Act (45 U.S.C. §2). Cars are required to be equipped with couplers which couple on impact. This has been interpreted by the courts to make the railroads liable for injuries resulting from the failure of cars to couple under almost any circumstances, in particular in actions brought for injuries to employees caused by coupling failures. If EPA regulations force railroads to limit coupling speeds to under 4 mph, with a penalty for creating noise at higher speeds, it could lead to an increase in the number of cars which fail to couple on the first impact, and possible responsibility for violations of federal law.

The only way by which the railroads could adhere to a maximum 4 mph coupling limit (and insure coupling) is by shoving each car to rest, an operating procedure reserved only for the most hazardous of commodities. If this procedure were implemented for all car traffic as a speed control measure, it would lead to immediate system-wide congestion and effectively halt railroad yard operations. The use of this procedure for such a purpose is so absurd that it is almost equally ludicrous to discuss it. We do though since the EPA indicates that changes in operation might be required in order to meet the standards if all other "technological" efforts fail.

That the operating procedure "shoving to rest", if implemented on any significant scale, would instantly burden the movement of traffic through the yards is evidenced by testimony presented in connection with the Illinois Commerce Commission's attempt to require shoving to rest for placarded cars containing hazardous materials in that state, which attempt was enjoined. The Atchison, Topeka and Santa Fe Ry. Co., et al v. Illinois Commerce Commission, et al., Civil Action No. 74 C 2334 (N.D. Ill., September 28, 1977). There Superintendent of Yards and Terminals of the Illinois Central Gulf Railroad estimated it would require 47 hours to switch 150 placarded cars to rest at its Markham Yard compared to 80 minutes using regular humping procedures. This would mean approximately 12 minutes per car, instead of the national average of 20 seconds. The General Manager of the Indiana Harbor Belt Railroad Company, which humps between 2,400 and 2,700 cars per day, estimated a loss of 60 percent capacity of the yard if only 60 cars per day were required to be shoved to rest over the hump, assuming an average of 2 cars per minute versus 15 minutes per car for the 60 placarded cars. The Assistant General Manager of the Chicago and North Western Transportation Company estimated a 20 percent loss of capacity of its Proviso Yard, assuming only 30 placarded cars per day were required to be shoved to rest. Similarly increased switching times were projected for flat yards too.

In all cases, the result would have been to strangle the yards to death. This is especially true in hump yards which are not designed for shove-to-rest operations. Railroads have invested hundreds of millions of dollars in yards designed on the principle that cars be switched by gravity, and forcing the use of those yards in a more costly and chaotic manner would be completely unreasonable.

In an attempt to quantify the cost of regulations which would require cars to be shoved to rest (a theoretical exercise), estimates have been made for the cost to Southern Railway's Inman Yard of shoving cars to rest as a means of strict compliance with the proposed 4 mph limit. This assumes it is physically possible to do so within the space limits of the yard -- which is clearly not the case. The additional daily cost to handle the same number of cars instead of hump them would be $148,355 for 357 crews, $35,937 for operations and maintenance, and $16,065 for fuel (total $200,347). This amounts to an annual expense of $73,126,655, plus $62,400,000 for the purchase of the necessary 130 extra locomotives. For shoving to rest instead of cutting off in an "average medium-sized flat yard, the additional daily cost would be $11,220 for 27 crews, $2,764 for operations and maintenance, and $1,215 for fuel (total $15,199). The annual expense would be $5,547635, plus $4,800,000 for 36 extra locomotives. All of the above cost estimates are not industry-wide or system-wide -- they represent the costs for just two yards.

For all carriers to comply effectively with the 4 mph coupling mandate the cost estimate would most likely greatly exceed EPA's estimate of the cost of acquiring additional land for buffer zones. It is virtually impossible to accurately estimate the cost of rebuilding yards, acquiring additional land to enlarge yards to accommodate the slower handling of cars, additional cars to make up for the decreased equipment utilization, additional locomotives (this work along could exceed $10 billion) and additional labor costs. Additionally how does one estimate the cost to the industry of immediately making virtually all of its hump yards obsolete and unusable! Total compliance with car input standards alone would bankrupt the industry.

What EPA has failed to recognize in proposing its standard for coupling speeds is that the 4 mph "rule" it cites is actually a goal, not a precise speed limit. This is true in practice whether the rule is written into a railroad's formal operating rules or is simply a recommended operating practice. There is no way a railroad can achieve coupling speeds of 4 mph or under at all times, even though this may be the stated and desired goal. As indicated, flat switching becomes a matter of judgment and experience in estimating when and at what speed to release a car; while hump yard switching is at its very best a computerized system of juggling factors related to speed with the intention of coupling at 4 mph somewhere far down the yard, even though all factors relating to car speed cannot be programmed into the computer. A margin of error is necessary and expected in the real world.

As noted earlier, EPA did not even approach the question of whether "technology" exists to ensure precise speed limitations. Based on its superficial consideration of car impact noise it focused on the laudable objective — "speed control" — and ignored the relevant aspects of the problem. In an ideal situation, each railroad would follow its best practice and bring each car to coupling at 4 mph. But there is no technology available to meet this goal. What railroads would like to do — for many reasons — is not what they are physically able to do.

In addition to the points raised above, the EPA proposed regulation on coupling noise should be dropped from the final regulations for another reason. Enforcement will be almost impossible. There is a serious question of how enough satisfacotry measurements can be made in an active railroad yard during operations. Measurement equipment must be placed at a specified distance from the noise source, but that may put the observer in the middle of switching operations. There is a second problem of trying to measure consecutive emissions from couplings taking place at different locations in the yard. Considering the problem as a whole, EPA is proposing a potentially dangerous and practically difficult measurement technique for the sole purpose of regulating a single point source of noise.

If the railroads are compelled to employ operating changes which slow down car movements and thereby decrease total rail capacity, as the proposed regulations would do, shortages of all kinds can be expected with resulting inflationary pressures and increased unemployment.

5. Refrigerator Car Noise

The EPA noise standard for refrigerator cars proposed in Section 201.14 is 78 dB measured at 7 meters distance, effective beginning 1982. Sound level measurements taken of a large number of refrigerator cars by the railroads and Wyle Laboratories indicate that at typical operating conditions mechanical refrigerator cars generate maximum sound levels of 82-88 dB measured at 7 meters from the center line of the track occupied by the car.

The AAR contends that the present maximum refrigerator car sound level represents the appliction of the best available technology and that application of further noise abatement techniques would seriously affect the proper function and operation of the refrigeration system and at an unreasonable cost. Furthemore, it is the position of the AAR that application of the EPA's proposed noise reduction technology, i.e., improved muffler, engine compartment insulation and fan modification, would not bring the refrigerator car noise level within the proposed noise standard of 78 dB at 7 meters.

As discussed in the Statement of Mr. R. F. McKee, marked at Exhibit J, the sound level generated by the mechanical refrigerator car has been a primary consideration in the design of the refrigeration system. Industry design specifications, established in 1953, set noise levels at 75 dB when measured at 25 feet from the unit. Even today with the application of the best available technology, the industry has been unable to achieve this design goal.

In the Background Document the EPA states that fan modifications, an improved muffler, and engine compartment insulation will bring the present refrigerator car within the proposed standards. This is simply not true. Fan and muffler design and unit enclosure were all carefully considered in component selection and configuration of the present standard refrigerator car design, and the present sound levels produced by these units represent the lowest noise levels achievable using these noise abatement efforts.

a. Proposed Engine Compartment Modification

The standard insulation-covered heavy-duty muffler, which is installed on virtually all refrigerator cars, was designed to meet Federal and State fire prevention standards for spark arrestors, to meet engine back pressure limits, and to reduce exhaust noise to the lowest level possible.

Sound level measurements taken at 7 meters from the center line of the track at the refrigeration unit end of the car consistently show that the highest noise levels come from the engine compartment door side of the unit where the engine is located and where the engine and refrigerator system air exits from the discharge air grills. See Figure 2

FIGURE 2

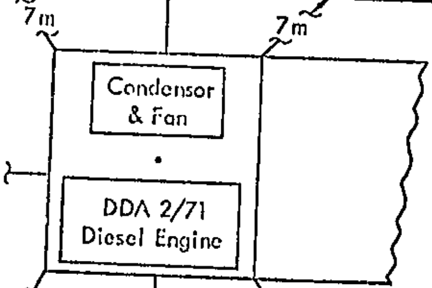
Sound Level Measurements of a Mechanical Refrigerator Car

		Fast	Slow
Engine & Cond.	High	76	76
	Low	71	71
Cond. Only		72	72

		Fast	Slow
Engine & Cond.	High	76	76
	Low	73	73
Cond. Only		--	--

Fast	Slow		
77	77	High	Engine & Cond.
73	73	Low	
70	70	Cond. Only	

		Fast	Slow
Engine & Cond.	High	76	76
	Low	74	74
Cond. Only		64	64



		Fast	Slow
Engine & Cond.	High	86	86
	Low	81	82
Cond. Only		66	66

Fast	Slow		
88	87	High	Engine & Cond
82	83	Low	
68	68	Cond. Only	

Fast	Slow		
86	86	High	Engine & Cond.
82	82	Low	
68	68	Cond. Only	

NOTES

Fast - Fast Meter Response
Slow - Slow Meter Response
Cond. - Condensor
High - Engine speed 1200 RPM
Low - Engine speed 800 RPM

for a typical refrigerator car sound level measurement. It is through the discharge air grills and louvers that the predominant noises generated by the mechanical unit exit the engine compartment. Noise measurements taken at other locations with respect to the engine compartment indicate that noise transmission through the solid walls of the engine compartment is substantially lower. Thus, insulation of the walls to reduce the noise level would <u>not</u> help to achieve compliance.

The only possible way to reduce the refrigerator car noise level would be to block off the discharge air grills and louvers so that the noise does not exit directly from the compartment. The only possible means of accomplishing this is to baffle and redirect the cooling air (after it has passed through the engine radiator) up through a ducting system out of the top of the car. However, that approach is unfeasible since the present engine-refrigerator unit arrangement does not allow room for the repositioning of major components to change the direction of the cooling air flow. Substantial modification of the engine compartment would be required. Redirection of the engine cooling fan air discharged out of the top of the car alone would not suffice. The door of the engine compartment which is grilled or louvered would have to be covered, and the grilled or louvered ventilation openings high on the sides of the compartment walls (which are also exit points for engine noise) would also have to be blocked off.

However, since the present engine compartment temperature often reaches 150°F. due to the buildup of heat from the diesel engine and refrigeration unit, it still would be necessary to vent the compartment in some other manner. At this time it is not known how this could be accomplished.

The redirection and discharge of engine cooling air out of the top of the car and the blocking off of wall and door openings are not without predictable problems.

The large grilled openings on the compartment door serve a purpose other than ventilation. Inside the engine compartment are operational indicating lights and the temperature setting thermostat device which must be observed from the ground during the daily in-transit inspections required by the National Perishable Freight Claim Rules. The present practice is to make these inspections as the refrigerator cars are briefly stopped at terminals or slowly rolled by the inspector who views these devices from ground level through the door's grilled openings, this practice avoids having to open and close every compartment door during each daily inspection. While this may sound like an insignificant factor, having to open and close each door for the hundreds of thousands of perishable inspections performed each year would significantly increase terminal delay time and unnecessarily delay high priority perishable train movements. In a similar manner the grilled opening on the door also allows the refrigerator inspector or serviceman to view the car thermometer located on the car side behind the door when it is moved to open position. Closing off or baffling these openings would negate this design advantage.

While it is contemplated that extensive modification of the unit can be accomplished to discharge the engine cooling air out of the top of the compartment, unless an alternative can be found, the closing off or baffling of the compartment ventilation openings will probably increase the engine compartment heat buildup, making the working environment for service and maintenance personnel more uncomfortable if not intolerable. The grilled openings in the compartment wall sides also provide openings through which outside light passes to provide illumination for the mechanic working inside the compartment. Finally, the effect of snow, rain, and freezing weather conditions on a roof located air discharge outlet are unpredictable at this time and could present serious design problems should an actual modification be attempted.

It is estimated that to redesign and relocate the components within the engine compartment in order to duct the cooling air out of the roof of the car and to block off the door and wall grill openings as a noise abatement measure to meet the proposed EPA standards would cost as much as $5,000 per car or $118 million for the national fleet of refrigerator cars. Even if the design problems associated with such a major modification were overcome, there would still remain uncertainties regarding effects on operation, servicing, and maintenance that could significantly increase operating costs. We can provide no estimate of how long it would take to make these modifications to the entire fleet, but most certainly the modifications could not be completed by the 1982 deadline. (Statement of R. F. McKee. Exhibit J.)

b. Proposed Fan Modifications

The EPA Background Document states, without any explanation, that technology exists for refrigerator car noise reduction to meet the proposed standards through "fan modifications."

The standard refrigerator car condensing unit uses one and sometimes two 1800 RPM electric motor driven condenser fans, and the diesel engine radiator cooling system uses a belt driven radiator fan. These fan designs were selected to minimize noise levels and are an integral part of the refrigerator condensing unit and diesel engine assembly. They cannot be readily altered to reduce noise levels without complete replacement and substantial modification of the engine and refrigeration systems. Assuming that a fan design change was technically possible to achieve compliance with the proposed standards without adversely affecting the system's basic function, which is not the case, it is estimated that the cost for such a modification would be as much as $2,500 per car. At present, there are no known noise-reducing replacement fan components compatible with the standard refrigerator car system designs. Even if there were, there are no engineering test data or operating experience to support the EPA's position that "modifying fans" would allow the present refrigerator car to meet the proposed standards.

c. The EPA's Comparison of Railroad Refrigerator Car Noise With Truck Mounted Units is Inappropriate

The Background Document analysis of refrigerator car noise refers to the noise level generated by truck mounted refrigerator units. Such a comparison is totally inappropriate! The truck refrigerator unit is a light-duty, lower capacity unit which does not have to meet the same operating requirements and design limitations as the rail refrigerator car unit. The truck unit is a design compromise that sacrifices longevity, capacity, and operating design margins for a unit weight, size, and cost substantially below that of the refrigerator car unit.

Truck units use a smaller, low horsepower, 4-cycle, naturally aspirated, automotive-type diesel engine directly coupled to the refrigerator compressor. The condenser and engine cooling air are provided by a single belt-driven fan with additional cooling air provided by the ram effect of the air into the front of the unit during the forward motion of the truck on the road. The cooling air is drawn into the front of the unit and discharged along with much of the refrigeration system noise out of the top of the unit. The life of these units is seldom more than 10 years with an average life on the order of 5 to 7 years. Because the cubic refrigerated space of the truck is significantly smaller than the refrigerator car, the engine horsepower requirements and refrigeration system capacity are also considerably less. Furthermore, the shock and impact design specifications for the truck refrigeration components are substantially less demanding than the rail car unit because of the cushioning effect of the rubber tires and the chassis spring system.

In contrast, the railroad refrigerator car system is designed for a minimum 20-year life. The shock and impact requirements of the refrigerator car unit are substantially greater than the truck unit. The operating environment of the refrigerator car unit is far more severe than the truck unit and requires stronger, heavier duty unit construction, design, and component selection. The refrigerator car unit is a high-capacity system incorporating a heavy-duty, two cycle, blower-aspirated diesel engine, with an engine-driven high-capacity cooling fan, and separate high-capacity condensing unit, an electric motor-driven cooling fan and compressor.

Unlike the truck unit which draws all cooling air into the front of the unit and discharges it out of the top, the refrigerator car condensing unit cooling air is drawn from the side of the car, discharged into the engine compartment, and the engine cooling air is drawn from the engine compartment into the inlet side of the radiator and discharged out of the side of the car. Suitable ventilation grill vents and openings have been provided in the compartment walls to provide maximum air flow within the compartment in order to meet the severe ambient temperatures encountered in railroad service.

Because of these substantial differences between the truck and refrigerator car systems, any comparison between the two systems as to noise generation mechanisms and attenuation methods is inappropriate and misleading. If the EPA had attempted to make even a limited investigation and review of the present mechanical refrigerator railroad car design rather than relying on refrigerated truck data, it would have been able to distinguish the distinct differences in the systems and would have recognized that the noise abatement techniques recommended for refrigerator cars are already incorporated into the present units and do not represent available technology which would achieve any measurable reduction in refrigerator car noise.

The cost estimates stated on pages C-5 and C-6 in the Background Document are meaningless inasmuch as the technology needed to meet the proposed standard is not presently available. Assuming, however, that the proposed technology would contribute to reducing the mechanical unit noise sufficiently to meet the proposed standards, the costs are woefully understated. To accomplish the proposed modifications, based on industry experience and a knowledge of components, the costs are as follows:

Techniques and Costs

	EPA	AAR
Improved Muffler	$ 10	$ 125
Insulation	90	245
Fan Modification	10	2500
Total Incremental Cost	$110	$2870

Applying the unit costs to all 23625 refrigerator cars generates an industry capital cost of $67,803,000 compared to the EPA estimated cost of $2,640,000. The more realistic figure to modify the refrigerator system to meet the proposed standards is the $120 million stated previously in this section.

d. EPA's Measurement Methods are Improper

The proposed EPA noise standard of 78 dB measured at 7 meters from the source appears to be based on improper measurement methods, atypical refrigerator car unit operations, and non-refrigerator-related car noise sources. The Wyle Research Report (Exhibit A) indicates that the EPA noise measurement data contained in the Background Document were based on measurements of truck refrigeration units, refrigerator car measurements taken with refrigeration units operating, and refrigerator cars operating on standby electrical power with the engine off. Also, it was learned that the number of measurements stated in the Background Document was incorrect. The number printed was 60, but the actual number should have been 27. Of the noise measurements reported, only five were actual measurements of rail refrigerator car units. These five measurements appear to be averages of levels of high and low throttle operations, plus an additional measurement with the diesel engine off and the refrigerator unit powered by an external electrical source. These data reported by EPA do not represent refrigerator car sound levels experienced under normal operating conditions.

Typical sound level measurements should be made when the maximum sound level is generated, which occurs when the refrigeration system is operating in the maximum refrigeration mode. This is at the high engine throttle operation with all refrigeration components operating at maximum output.

Several refrigerator car owners and the AAR conducted sound level measurementes in April 1979 to determine the range in sound levels under various operating conditions. Based on measurements from 50 different railroad refrigerator cars, the energy average of maximum levels at 7 meters was found to be 85 dB. (Exhibit A, p. 25)

Based on a comparison of these measurements with the noise measurements in the Background Document, it is apparent that the proposed EPA noise standard for refrigerator cars of 78 dB measured at 7 meters was based on inaccurate data and unreliable measurements.

The proposed EPA refrigerator car noise standard of 78 dB has a further flaw vis-a-vis the proposed EPA receiving property line standards. It is frequently a fact in actual yard operation that refrigerator cars -- trains of up to 100 cars -- are stopped for inspection and service near the outer boundaries of a railroad yard property line for periods of up to four hours. Given that situation, even if the proposed maximum allowable refrigerator car noise standard of 78 dB at 7 meters could be met (which it can't), it is very likely that the proposed EPA receiving property line standard of 70 or 65 dB, would be exceeded, thereby exposing the railroad to possible enforcement action. The easy answer to the problem may appear to be to relocate the service/inspection tracks away from the railroad property line. However, perishable produce trains frequently are trains which bypass the hump yards on outer yard or mainline trackage. Therefore, the inspection and service areas must be located for easy personnel and automotive service equipment access which is best accommodated at the periphery of the typical railroad yard arrangement. Thus, relocation of service/inspection tracks is not a viable alternative.

Based on the foregoing discussion, the AAR and refrigerator car industry conclude that the proposed EPA noise standard of 78 dB is unrealistic and is not supported by reliable noise data, engineering studies, or existing, economically feasible technology. Furthermore, the EPA does not have sufficient or adequate information to predict what adverse effects the application of untried noise abatement technology may have on the operation and performance of the mechanical refrigerator car system.

6. Load Cell Test Sites

Among the abatement techniques which EPA identifies as being necessary to meet the receiving property standards are the relocation or enclosure of load cell test sites.

With respect to the recommended enclosures of load cell test sites, EPA estimates that there are 216 such test sites in the country. In a 1976 survey AAR determined that there were only 182 such facilities owned by the railroads. The EPA further estimated that a 3,000 square foot industrial-type structure would have to be constructed to enclose a locomotive, at a cost of $90,000 per structure. The EPA's projected capital costs to enclose all load cells is $19,440,000. Its projected annual maintenance cost is $1,994,000.

While at first blush it may seem that the existence of fewer load cell test sites than the EPA source indicated might reduce the overall capital and annualized maintenance costs, the existence of fewer facilities is an irrelevant factor since the EPA has grossly underestimated the costs to implement this technique. Ample support for the AAR's contention is set forth below.

The Illinois Central Gulf Railroad has constructed two enclosure in which to load test locomotive engines. At their major locomotive rebuilding facility in Paducah, Kentucky, an enclosure was built to house the engine by itself at a cost of approximately $300,000. At a second site, the Woodcrest Shop in Chicago, Illinois, an enclosure for the entire locomotive was constructed for about $200,000, however the design has since proven inadequate on account of improper air circulation. According to the acoustical contractor who designed and supervised construction of the Woodcrest facility, the Woodcrest structure provided a reduction in noise from 106 dB inside to 83 dB outside the building with the locomotive at full throttle. The control room was reported to be 79 dB. The ICG estimates that the facilities at Paducah, Kentucky, and Chicago, Illinois, would currently cost $462,000 and $416,000, respectively, to build. (Exhibit K).

The Burlington Northern retained Bolt, Beranek and Newman, Inc. to study the requirements of a locomotive load cell test enclosure. The results of the report were used for the development of architectural plans for an enclosure. A 2,800 square foot building was estimated (in 1975) to cost $250,000. (Exhibit L). Further studies indicated the need for complete redesign of the air exhaust system which would have increased the cost of the enclosure significantly. The enclosure was never constructed.

The Louisville and Nashville Railroad converted an old coach shop into a double test cell approximately

80 feet long by 40 feet wide. It was divided into two cells and the ceilings were lowered to 17 feet. Three-inch acoustical panels were installed on the walls and an exhaust system and silencers were placed on top of the building. The conversion of this existing building cost approximately $301,837 in 1976.

The Santa Fe estimates that multi-unit load cells could replace existing load test facilities for an average of $1.6 million each.

ConRail estimates that new enclosed load cells could be constructed for $711,000.

In view of the foregoing cost estimates supplied by various railroads, a conservative estimate of $500,000 per facility would appear to be appropriate as representative of the costs involved in enclosing a load cell with an acoustically designed structure with adequate air handling capabilities. Assuming that the 179 load cells will have to be enclosed, the costs would be $89,500,000. Annual building maintenance costs to the industry are estimated to total $8,950,000 for these structures. Although, admittedly, enclosure of load cell test sites will attenuate the noise generated by load cell testing, the costs are disproportionate to the benefits gained.

EPA makes no mention of the fact that at least 4,654 locomotives equipped with dynamic brakes have the ability of self-loading and thus are not restricted to load cells for such testing. These locomotives are generally self-loaded in the vicinity of the engine repair facility and contribute to the overall yard noise levels as do the units tested on the load cell. The EPA does not appear to appreciate the fact that the construction of buildings to enclose the load cells for testing locomotives without self-load capabilities would be of limited effect since it would not affect a significant portion of the locomotive fleet.

Relocation of load cells would have little effect as a noise abatement technique and should not be considered to be an available alternative. The load cell test sites, as recognized by the EPA, are of necessity in the general vicinity of or are adjacent to engine repair shops. Relocation of the load cells would result in substantial relocation costs, losses in productivity and efficiency due to increased manpower and locomotive movements, and may, indeed, simply result in their movement to new locations where the noise would be increased on adjacent receiving property. The relocation of load cells away from the repair shop would require the movement of the locomotive from the repair shop to the load cell. Because the locomotive being tested would be unable to move under its own power, it would be necessary to haul the locomotive to the load cell test site, requiring an additional locomotive as power which in turn would contribute additional noise to the yard. It would also require the use of extra hostlers, yard crews, or road crews, depending on the location of the new test site. The hauling of locomotives from the repair shop to the load cell would also contribute to yard congestion problems. The locomotive could not be hauled to the load cell test site and back to the repair shop without difficulties. It would be necessary to schedule the movement into the normal pattern of traffic in a yard.

It is virtually impossible to estimate the costs associated with the relocation of load cell test facilities. The cost of moving the "load boxes" would be only a small part of the total cost. Labor costs would increase, repair shop activities would be disrupted, additional locomotives would necessarily be used, fuel would be wasted and normal yard operation would suffer from the interruptions. All of these additional costs and operational problems would be imposed on the railroads just to move the noise source to a new location where it would affect another segment of the receiving property. The shorter the distance the load box is moved the less likelihood that its contribution to the total noise in a yard would be significantly reduced. However, the greater the distance it is moved the higher the resulting costs would be. Additionally even at the new location, a long distance from the repair shop, the locomotive under test will generate noise having an impact on receiving property.

7. Ductile Iron Brakeshoes

In the Notice the EPA identifies ductile iron shoes as one component of the "best available technology" for reducing retarder squeal noise. The application of ductile iron shoes in retarders is considered by the EPA to be necessary if railroads are to meet the 1985 receiving property standard at hump yards. At page C-3 of the Background Document the EPA retreats slightly from the position that ductile iron shoes constitue the "best available technology" when it refers to the substitution of ductile iron as a "noise abatement technique under consideration" for reducing retarder noise. This reference in the Background Document is a more accurate characterization. Ductile iron shoes do not constitute proven technology. They are, at best, in the experimental stage and further testing of them is required. This testing and experimentation is continuing because the railroad industry and the brakeshoe suppliers are committed to solving the retarder squeal problem. At present ductile iron shoes represent only one possible solution to that problem.

Retarder squeal is generally considered to be caused by a stick-slip action of the wheels of a freight car against the brakeshoes as they pass through an operating retarder. The wheel is thought to be the primary noise source. Various experiments have been conducted over the past 15 years or more in an attempt to eliminate the stick-slip action and the buildup of vibration in the wheel and retarder. Methods include metallurgical changes in the shoes to provide lubrication. Such experiments have used graphite, lead, and manganese in varying quantities in the shoe. Ductile iron is only one of the mediums in which the lubrication has been contained. Other methods attempting vibration isolation include differences in shoe design, shoe configuration, and retarder modifications.

These experiments have yielded varying degrees of success. Often the brakeshoe provided some reduction in the number of squeals but had no effect on the sound level of an individual squeal. However, the reduction in occurrence of squeal was also most often offset by a high rate of metal failure or extremely rapid wear of the shoe material.

Other tests include the spacing of softer shoes between standard steel shoes and, as in the EPA example in the Background Document, using soft shoes on the inside beam where greater wheel contact is experienced and hard shoes on the outside beam. While the wear rate improves somewhat under these conditions, the noise levels are generally unimproved.

At this date there are several railroads engaged in continuing experiments in retarder noise reduction by means of "low noise" brakeshoes. For example, Southern Railway Company and the Richmond, Fredericksburg and

Potomac Railroad Company are currently operating retarders equipped with experimental brakeshoes developed by the Q-IV Corporation. The operation of these brakeshoes is being closely watched because they seem to be somewhat more effective than previous experiements in reducing the number of squeals and yielding an acceptqble shoe wear life. The experiments with ductile iron shoes on the Southern Railway System date back to 1971 when slotted ductile iron shoes were installed in retarders at Southern's hump yard in Macon, Georgia. No change in noise levels was achieved with the use of those shoes and they wore out in 10 days. Subsequently, in 1973 Southern experimented with lead-filled shoes. Holes were drilled in the shoe face for the insertion of lead plugs to provide a form of automatic lubrication. The cost of those shoes was excessive, and the experiment was terminated. Also in 1973, Southern tested an experimental nylon-filled shoe (similar in design to the lead-filled shoe). This shoe wore well but no noise reduction was achieved, and its cost was excessive. Southern is realizing even more success from an experimental metal shoe ("Q-IV Low-Noise") which is not a ductile iron shoe. Southern began its experiment with the special alloy "Low-Noise" shoe in 1973, and tests are still continuing.

Despite the fact that the <u>number</u> of retarder squeals may be reduced by the application of ductile iron or other experimental retarder brakeshoes, peak noise levels are still above the proposed EPA point source noise standard. Therefore ductile iron brakeshoes cannot be considered as proven noise abatement technology available to meet the proposed standards.

There are currently no industry standards for low noise brakeshoes, and none of the shoes made today exhibit the wear characteristics of standard steel shoes. Since most hump yards are currently operating near full capacity and maintenance intervals are scheduled so that they are as few and as short as possible, it simply is not feasible at this time to require the installation of low noise brakeshoes on all retarders, especailly since such shoes do not represent the best available technology yet and are still experimental in nature.

8. Releasable Inert Retarders

In the Notice the EPA includes the use of releasable inert retarders as a noise abatement technique to enable hump yards to meet the 1985 L_{dn} 65 dB standard. (Table 4.2, 44 F.R. 22964). In discussing the cost of compliance, the EPA states that the application of this technology is "considered necessary to meet the proposed final hump yard facility receiving property standard". In rendering that assessment, the EPA offered no supporting data which can be used to evaluate the effectiveness of installing releasable retarders as a noise abatement technique as it relates to the receiving property standards. In fact, it is not possible to estimate the effectiveness of retrofitting classification tracks with releasable retarders because no attempt has been made to quantify the contribution of inert retarders to the total noise generated in a yard.

With respect to the cost of retrofitting the classification tracks with releasable retarders , the EPA has grossly understated the costs. On page C-5 of the Background Document, EPA gives an estimate of $10,000 for replacement of an inert retarder with a releasable retarder. This cost is derived from costs shown on pages 5-35 and 4-36 of the 1975 Background Document which are stated to be for conversion of non-releasables to releasables and which do not include labor, down time, or operation costs. The

1975 Background Document specifically notes that the costs of shutting down a yard or part of a yard during installation or maintenance of these systms could double or triple the estimated costs. In the 1979 Background Document the EPA incorrectly identifies the actual purchase costs of releasable retarders and totally ignores installation costs, including labor, down time, and operation costs.

In analyzing the costs given by the EPA, the AAR obtained cost estimates directly from equipment suppliers as well as from individual railroads. The estimates obtained included the price of the equipment as well as installation and maintenance costs associated with releasable retarders. The following is a summary of the information received.

ABEX Corporation provided an estimate in 1978 of approximately $20,000 for one model R-14 hydraulic release retarder, not installed. (Exhibit M).

WABCO gave cost information in 1978 for their equivalent product, an operable, weight responsive, single rail skate retarder. A typical installed retarder would cost $36,000 per track. (Exhibit N).

The Atchison, Topeka & Santa Fe Railway Company provided estimates of modifying inert retarders to releasable types, including labor, at $33,500 apiece in 1979 dollars. At another yard on this raiload, conversion from inert retarders to operable retarders is currently in progress. The retarders are being installed with remote controls at a cost of over $39,000 apiece. Extensive modifications to the existing electrical system were necessary to make this conversion.*/

The Chessie System estimated the purchase and installation of 25 releasable retarders at $1,100,526 or $44,021 each (1979 dollars) for their Cumberland, Maryland yard. This cost includes the labor charge to remove the old inert retarder, engineering, materials, contingencies, equipment rental, and insurance.

Burlington Northern has estimated installation of releasable inert retarders at $35,000 to $50,000 apiece. (Exhibit O).

In view of the foregoing estimates, a more realistic estimate of an installed releasable inert retarder is $40,000 per unit.

The EPA estimates that there are approximately 3,996 classification tracks which would require retrofitting with releasable retarders. It is our estimate that only about 3,306 classification tracks would require retrofitting. There are currently at least 4,732 hump yard classification tracks in operation on railroads in the United States. Of these, seven yards and 324 tracks

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*/ Telephone conversation of May 22, 1979, between Mr. Neil Thorne, Signal Engineer, AT&SF, and Mr. Walter Studabaker, P.E., AAR.

are already equipped with releasable retarders, leaving 4,408 tracks unequipped. It is estimated that 75 percent of these 4,408 tracks, or 3,306 tracks, currently have inert retarders installed. The remainder have no retarders installed. Thus, using an estimate of $40,000 per retarder, the cost to replace these inert retarders is estimated to be $132 million. Operations and maintenance is estimated at $13.2 million annually for the industry.

9. Retarder Lubrication

The lubrication system referred to in the Background Document has been installed in only one hump classification yard, the Burlington Northern's Northtown Yard located near St. Paul, Minnesota. The system was installed as an experimental system during construction of the Northtown Yard. It is not considered a proven noise abatement technology then, nor is it considered acceptable technology today because of the many operating and maintenance problems encountered. Furthermore, the cost estimate given by EPA on page C-3 of the Background Document is considered by the AAR and the BN to be inaccurate because there is no consideration of the costs involved in retrofitting, operating, and maintaining this system in an existing yard. Finally, there are no data that show the lubrication system has any effect on retarder noise levels.

The installation of a lubrication system in an existing hump yard would be an extremely expensive and in some cases an impossible task to perform. The lubrication system requires a catch basin for collection and discharge of the lubricant. Considerable piping must be installed leading from each retarder to a recycling center where the lubricant is reconstituted and pumped back to the retarders. Waste water and overflow from the system containing oil and ethelyne glycol must be treated prior to discharge. Due to the presence of oil, a dissolved air flotation treatment system must be provided and because of the anti-freeze, a biological treatment system is also necessary. Obviously a NPDES permit is required in connection with the discharge.

Operating problems are particularly troublesome with the lubrication system. At low temperatures, the system is generally unreliable and becomes virtually unusable. Early in the winter, the oil must be eliminated because it separates from the water and clogs the system. Ethelyne glycol is added to prevent freezing, but despite the presence of anti-freeze, the lubricant becomes 'slushy', clogs the nozzle, and finally freezes. In fact, piping freezeups have occurred even with a 50% solution of ethelyne glycol and water.

The system requires considerable maintenance. The spray nozzles must be constantly kept free of biological growth, oil, and solids. The entire retarder area is almost constantly covered with oil and must be cleaned frequently. Extensive maintenance of the retarder is preceded by a thorough cleaning which takes up to 8 hours. Minor retarder maintenance requires extreme caution on the part of maintenance personnel due to the slippery conditions. Rancid odors are also a problem resulting from biological degradation of material fallen from passing cars mixing with the lubricant. The solid waste collected from the retarder basins may even be considered to be a hazardous waste under RCRA for purposes of storage and disposal.

Another basic problem encountered with installing a lubrication system on a retarder is that the lubrication system reduces the retardability of the retarder by about 15 percent to 25 percent, depending on the equipment. To compensate for this, additional length must be added to the retarder. Because of space restrictions in some yards, this may be physically impossible for existing yards. As with lubrication system installation, adding length to the retarder under operating conditions requires the shutdown of the retarder. To shut down the master retarder for initial modification means the yard would have to shut down for an extended period of time. This is almost impossible since retarder yards are in almost constant operation.

With regard to the noise abatement abilities of the retarder lubrication system at Northtown Yard, BN representatives have confirmed the fact that no studies have been conducted to determine the effectiveness of the system separately from the other abatement techniques employed there. It is generally thought that spraying lubricating material on the wheels of a car passing through the retarder only decreases the likelihood of retarder squeal and not the maximum levels. This has not been statistically confirmed at Northtown.

The lubrication system presents another problem which is undesirable to the railroad industry. During the spray operation, the lubricant is sprayed onto the wheels and undercarriage of the freight car. This mixture is carried along with the car and eventually falls to the ground. It is not desirable, in our opinion, to encourage the application of retarder lubrication because of this pollution problem. Furthermore, it seems logical to conclude that the spraying of a lubricant onto the car wheels and brakeshoes will also adversely affect the braking ability of the car at least until the lubricant clears from the brakeshoe and wheel friction surfaces. This temporary loss of braking ability may well present serious train-braking problems for full trains made up of cars having just passed through the retarder and spray solution.

As stated earlier, the costs published by EPA are substantially lower than would be encountered in retrofitting existing yards with a lubrication system under traffic. Based on estimates developed by Consolidated Rail Corporaton (ConRail), average costs for installation of a retarder lubrication system, not including track or yard down time, are $1.6 million per yard. (ConRail will be submitting a separate statement in this proceeding.) A wastewater treatment facility designed to treat the overflow and wastewater would cost about $1 million per yard. Increasing the length of the retarder is estimated at $4 million per yard. Thus the estimated average cost to install a lubrication system and increase the retarder length sufficiently to maintain the necessary retardation is $6.6 million per yard. This does not include any track and yard down time, nor does it cover the possibility of cutting through any unmapped air, signal, communication, or electrical lines buried in the yard. Operating and maintenance costs, including makeup oil and anti-freeze for the lubrication system, electrical, wastewater treatment operating costs, discharge fees, equipment maintenance, and cleaning, are conservatively estimated at $660,000 per yard. Based on these figures, the industry capital costs are estimated to be $770 million and the annual operating and maintenance costs are about $77 million.

It is the position of the AAR and the railroad industry that the retarder lubrication system does not constitute best available technology taking into account the cost of compliance for the reasons described above. The system has not been proven as an effective noise abatement technology, the operation and maintenance problems are extraordinary, and the safety hazards and pollution problems resulting from its operation are unacceptable. The costs are shown to be extremely high and the dubious achievable benefits do not justify the expense at all.

10. Estimated Cost of Yard Noise Level Measurement

On page C-11 of the Background Document, EPA estimates that the labor cost for yard noise measurement will vary from $500 to $2,000 per yard, depending on the size of the yard and that instrumentation will cost $10,000 per set. None of these estimates are sufficiently explained or referenced to enable critical examination of the underlying assumptions.

While the instrumentation estimate appears reasonable in that $10,000 will buy a community noise classifier, sound level meter, and calibrator, it would not be sufficent for any other pieces of equipment, notably a strip chart recorder and a tape recorder. The 5-year equipment life projected by EPA does appear reasonable.

The labor cost estimates, however, are exceptionally low. On the surface applying the EPA's assumption that each yard would be measured once a year and given the arduous, painstaking task of determining dominance and of identifying various noise sources from strip chart recordings, the AAR estimates that about one yard could be thoroughly examined each month per measurement set. Thus, the EPA's projected cost of $500-$2,000 per yard is very low. The cost should be more on the order of $4,500 per yard assuming a two-man crew is employed to take the necessary measurements. Therefore the total incremental cost of annual rail yard measurement is estimated to be:

Capital Cost	Annualized Cost	
$5,900,000	$ 1,556,405	5-year Amortization
	590,000	Maintenance
	18,560,000	Labor
	$20,706,405	

It is presumed that the measurement team would be comprised of a senior analyst and an assistant. The larger railroads would most likely require the services of such a team on a full-time basis, while the smaller companies which would not need a full-time staff but would use the services of outside acoustical consulting firms. The use of outside firms will raise the measurement costs considerably.

Inasmuch as there is a lack of qualified acoustical engineers at the present time, it is doubtful that there would be sufficient time before the proposed 1982 receiving property standard went into effect to permit all railroad yards to be measured to ascertain which noise abatement techniques should be implemented and to implement those techniques. In any event, for some time to come practically all railroads would have to compete for the services of the limited number of qualified acoustical engineers.

III. The Receiving Property Standards Are Unreasonable

A. The Evidence Available to EPA Shows That The Receiving Property Standards Are Unreasonably Low

In Section 4 of the Background Document the EPA discusses the Results of noise measurements made at given railroad yards. This data includes the results of measurements made at Northtown Yard which is owned and operated by Burlington Northern, Inc. at Fridley, Minnesota, in the vicinity of Minneapolis/St. Paul, Minnesota. The construction of Northtown Yard was completed in 1975. Its features include many of the noise abatement techniques identified by EPA which requires the installation of hardware or which requires the application of technology to the facility.*/

Ldn measurements were taken at three different test sites at Northtown Yard by the BN. See Exhibit I. However, the only Ldn measurements which were taken into consideration by the EPA were those at Site #2 which ranged from 67-68 dB.. (Background Document, Table 4.4). The apparent reason for the EPA's discontinuing the higher Ldn levels measured at Site #1 (up to 74 dB, according to

*/ The only features not included at Northtown are the recommended switch enginve treatment and mechanical refrigerator car treatment, which treatments, as shown elsewhere, will not appreciably reduce the noise levels of such equipment or enable the yards to meet the proposed property line standards.

Table 4.5) must be the agency's view that measurements taken inside the railroad property line are irrelevant. The industry submits that basing relevancy on such a technical distinction, i.e., whether the measurement site was inside, at or beyond the railroad property line, without taking into consideration the distances involved, the physical layout of the particular yard and the proximity of the measurement site to the nearest piece of railroad equipment and major noise source is completely arbitrary and unjust. Such a technical distinction precludes the application of data highly relevant in assessing the ability of yards in general to meet the proposed Ldn standards.

For instance, at Northtown, even though the specific measurement site at which the Ldn was measured was 115 feet from the boundary line, it was approximately 210 feet from the nearest piece of railroad equipment and even further removed (as described below) from the major noise source. Since the property line and receiving property around many railroad yards can reasonably be expected to fall within 200 feet of the nearest piece of railroad equipment, (see Exhibit P) the measurement of Ldn 74 dB at Northtown Yard is a very relevant measurement in assessing the industry's ability to comply with the 1982 standard of Ldn 70 dB and the 1985 standard of Ldn 65 dB. Thus the 74 Ldn measurement should have been considered by the EPA.

When one considers the noise abatement techniques employed at Northtown Yard, the position of noise sources relevant to the measurement sites and the distances from the major noise sources to the measurement sites, it becomes quite clear that the receiving property standards are unreasonably low for hump yards and connot be met. Tables 4.1 and 4.2 in the Notice list the abatement techniques to be applied in hump yards to reach the Ldn of 70 dB and Ldn of 65 dB. Following is an analysis of each one of those techniques as they might have affected the 74 dB measurement obtained at Northtown:

-- Retarder Noise Barriers. Northtown Yard is equipped with noise barriers at the master retarder and at the group retarders. The barriers are 8 feet high and extend beyond the length of the retarder by 10 feet at the point of car entry and 10 feet at the point of car exit. Significantly, the master retarder is 950 feet from the measurement site and the nearest group retarder is approximately 600 feet from the measurement site.

-- Mechanical Refrigerator Cars. Mechanical refrigerator cars are not stored on tracks near the measurement site identified as "Location 1" on Exhibit I, and only such refrigerator cars being classified or in trains arriving or ready for departure would have been present. A caboose/refrigerator car servicing facility is located approximately 1,100 feet away from the measurement site. The refrigerator cars are spotted at this facility for fueling only, and all repair work is done at another location. These cars would not be at the servicing facility for any extended periods of time. In any event, the noise emitted by such cars when spotted at the servicing facility would be attentuated by the hump, the hump tower, and the service facility structure which are in the line of sight from the measurement location. Also, as noted elsewhere, the EPA's contemplated technology for mechanical refrigerator cars will not reduce the noise generated by such cars by any significant degree.

-- Switch Engine Treatment. As previously described, the treatment recommended by the EPA would have little impact in reducing the total noise emitted by locomotives idling on in low throttle positions. Because of the relative distance of specific operations, switch engines would not be a major noise source at the site.

-- Relocate or Enclose Load Cell Test Sites. The load cell test facility was 1,500 feet from the measurement site and was blocked from view by the diesel repair shop.

-- Relocate or Shutdown Idling Locomotives. An examination of the layout of Northtown Yard shows that the relocation of idling locomotives would not be possible without completely redesigning and rebuilding the yard.

-- Dutile Iron Shoes. The retarders are not equipped with ductile iron retarder shoes. However, they are equipped with a lubrication system which is designed to obtain the same results.

-- Releasable Retarders. Northtown Yard is equipped with releasable inert retarders at the end of the classification tracks. In addition, the car repair facility and the diesel shop are both enclosed.

Northtown Yard was built with sufficient room available for the construction of longer retarders required by the lubrication system and for the necessary clearance for barriers at all of the retarders. By design or by coincidence of yard layout, virtually all of the abatement techniques that the EPA identifies as being necessary to meet the 1985 standard of Ldn 65 dB are present at Northtown Yard. And yet a measurement of Ldn 74 dB was obtained at a point far enough removed from railroad noise sources that it duplicates the "receiving property" surrounding many yards. This fact drastically undercuts the EPA's contention that the proposed Ldn levels are achievable by hump yards.

It is important to note that Northtown Yard does not represent the "state-of-the-art" in railroad yard construction. Northtown represents art in the "experimental" stage. If anything, it is only the "state-of-the-art" in the construction of <u>new</u> yards where sufficient land is available to incorporate the noise control features included in that yard.

Even if one considers just the property line measurements ranging from Ldn 67-68 contained in Table 4-4 of the Background Document, like the EPA did, the unreasonableness of the proposed receiving property standards stands out. That railroad yard which includes the most sophisticated and effective noise control features identified by the EPA, which features were installed at a total cost of approximately $1,503,182*/, cannot meet the EPA's proposed standards. How the EPA can legitimately expect existing hump yards to meet the proposed Ldn standards when Northtown cannot remains unaddressed and unanswered.

B. It Would Be Unreasonable To Adopt Standards Using The L_{dn} Descriptor Because The Limited Alternatives Available Are Neither Feasible Nor Cost-Effective

In the Notice and in the Background Document the EPA suggests that there are two alternatives to the application of the technology identified. At various points EPA suggests that railroads could meet the receiving property standard by acquiring additional land surrounding railroad facilities or else the railroads could reduce nighttime operations. The first of these two alternatives -- land acquisition -- has been discredited by EPA itself. It is estimated that this alternative as a noise abatement technique would cost the railroad industry approximately $4 billion. This is clearly unreasonable and the EPA acknowledges that such a burden cannot be placed upon the railroad industry.

As to the second alternative -- reduction of nighttime operations -- the EPA suggests that its proposed standards could be met by application of the identified technology and no curtailment of nighttime operations would be required. However, as previously demonstrated in these comments, the application of the recommended abatement techniques will not permit railroads to meet the L_{dn} 70 and the L_{dn} 65 standards. The EPA appears to reject the alternative of curtailing operations at night and found that the cost of operational curtailment was extremely difficult to estimate (44 F.R. 22966). Attempt was made to estimate the cost of rescheduling nighttime activities, but this estimate did not include the cost of physically expanding rail facilities, the cost of additional rail cars to make up for the lost car days. Despite its failure to include these significant cost items the EPA suggested that the total incremental cost resulting from the curtailment of yard operations from 10 o'clock in the evening to 7 o'clock in the morning would be approximately $576.6 million in capital expenditures and $364,926 in increased annual operating and maintenance expenses.

This staggering increase (which represents only the tip of the iceberg) should have been sufficient to compel the EPA to reject this alternative out of hand. The failure of EPA to specifically find that the rescheduling of nighttime activities is not a viable alternative and its failure to acknowledge the full impact of such an alternative causes grave concern within the railroad industry. This is particularly serious in view of the fact that the recommended abatement techniques will not sufficiently reduce noise to the proposed levels.

Because of EPA's failure to adequately consider the full impact of rescheduling nighttime activities, it is necessary to complete the record in this proceeding and dispose of the ill-conceived notion once and for all that rescheduling of nighttime operations might be a viable alternative. The consequences of even attempting implementation of the notice would be devastating.

The data collected and analyzed by the EPA discloses that railroads operate 24 hours a day. The noise measurements show that the noise levels during nighttime hours are roughly equivalent to the daytime noise levels. Table 4-8 in the Background Document displays the comparison of day and night sound levels*/ and clearly shows the

*/ The comparisons in Table 4-8 were based on L_{eq} measurements. Comparable L_{dn} measurements would be approximately 6dB higher. See Table 4-4.

level of that nighttime noise is not appreciably different than the level of daytime noise. Furthermore Table 4-7 in the Background Document shows that high activity levels occur during both nighttime hours and daytime hours and that the maximum L_{eg} levels were obtained during nighttime hours as well as during daytime hours at the various yards measured.

The reasons for the comparability of nighttime and daytime noise levels arise from the very nature of railroad operations. Train movement and car classification operations are required to be conducted 24 hours per day. Trains arrive at yards at all hours of the day and night and the cars must be classified, switched to shippers'and receivers' facititles or dispatched in departing trains as quickly and efficiently as possible. Failure to handle the incoming cars promptly would preclude the handling of subsequent car and train arrivals. Given the fixed and limited nature of the existing nationwide physical rail facilities, those facilities must be operated on a 24 hour basis to keep cars moving through the system. Any disruption whether localized or on a broad area basis would have significant disruptive impacts far beyond the area of the site of the initial curtailment of operations.

It is simply not feasible to schedule the arrival or departure of all trains from the hours of 7 o'clock in the morning to 10 o'clock in the evening. This is illustrated by the example in the Statement of Mr. W. V. Williamson, Exhibit Q, wherein he explained that the three-shift switching capacity of Southern Pacific's Los Angeles, California hump yard is approximately 2200 cars with the average through-put in the range of 1800 to 2500 cars a day. Since the physical capacity of the switching facility is 700 cars per 8-hour shift, any effort to reduce or eliminate switching during nighttime hours would result in an immediate backup of cars. Similar curtailment of nighttime activities of most other railroad switching facilities would have the same effect and would soon bring the entire railroad system to a halt.

The scheduling of trains at one location has a direct impact on the scheduling of trains at many other locations. Prohibiting train movement or car classification from 10 o'clock at night to 7 o'clock in the morning at one location would result in a direct and immediate curtailment of activities at other locations and not just at the nighttime hours. However, as will be discussed later, the cessation or curtailment of nighttime hours would have a much more serious disruptive effect than merely shifting operations from one location to another.

Nighttime activities are not confined to the classification yards. A substantial amount of the industrial switching operations are conducted during these hours. Nighttime opeations are essential to accommodate customers' service requirements. Rail customers across the country require and demand nighttime switching operations. Additionally, in many urban areas daytime switching is prohibited where vehicular congestion precludes train opeations.

The Statements of both Mr. W. V. Williamson, Exhibit Q, and Mr. John B. Hitchcock, Exhibit R, confirm the AAR's position that many industries, especially those with multi-shift operations, require and demand nighttime switching in order to handle the high volume of cars and to provide a constant flow of materials into the plants during all shifts of operations. Prime examples are the automobile assembly plants served by the railroads. Most autombile assembly plants are multi-shift opeations with high railroad car volume requirements to provide the assembly line material during each shift. Essentially, the railroads provide warehouse inventory on wheels for the automobile assembly plants with material moving directly from the cars to the assembly line. Curtailment of nighttime switching activity would result in a shortage of production materials and soon a shutdown of second shift plant operations. Similar predictions would be true for many other types of major industrial production operations. Curtailment or shutdown of railroads would mean curtailment and shutdown of industry in general, with concomitant severe unemployment for the nation.

Aside from the fact that curtailment of industrial switching during nighttime hours would directly cause a slow down and eventual shutdown of nighttime industrial plant operations, curtailment of railroad yard activity at night would also impede the required switching and classification of inbound and outbound cars that must be handled in the railroad yards before and after normal industrial plan switching is performed. Thus, it is essential for continued industrial production to have railroad yard switching during nighttime hours.

The failure of the EPA to recognize the legitimate need for sustained nighttime railroad activity in the nation's railroad and industrial switching yards and the grave consequences of curtailing this nighttime activity would be to ignore the true realities of our nation's industrial and transportation needs. To make it perfectly clear to the EPA that what the industry is saying is true, the AAR asked Southern Railway Company to run a computer analysis on the effects that curtailment of yard opeations during nighttime hours would have on Southern's overall system operations. The results of the study, included as Exhibit S, were disastrous for that railroad system, implying even graver consequences for the industry as a whole.

To conduct the study Southern employed a computer network model called SIMTRAN which was designed in the early 1970's to evaluate the impact of major operating changes on the railroad. Three simulation exercises were conducted, with each exercise testing a different curtailment assumption. The "standard" network used contained 46 terminals on the Southern Railway System. The traffic period selected for the exercises was May 1-16, 1977, a typically heavy traffic period.

In the first case study, the effects of total curtailment nightly at one major yard were evaluated. The second case study considered the effects of partial curtailment nightly for yards bordering on "developed" land. In each of these first two cases, the nighttime curtailment was reflected in SIMTRAN by reducing or eliminating the midnight to 8:00 a.m. processing rate for the yards involved, i.e., the third shift. While the midnight to 8:00 a.m. period is one hour shorter than the 10:00 p.m. to 7:00 a.m. criterion proposed by the EPA in its L_{dn} measure, this variance was considered to have little if any effect on the results predicted by the model. In the third case study, the processing rate for each shift was adjusted to reflect a 50% reduction in processing during the nine hours from 10:00 p.m. to 7:00 a.m. and a 10% increase in processing during the fifteen daytime hours. This was done for all yards bordering on developed land.

The first test undertaken was intended to show the effect of totally shutting down car classification at one major yard facility during the period midnight to 8:00 a.m. Inman Yard, located within the city limits of Atlanta, Georgia, was chosen. Inman is the largest hump yard operation on the Southern. Approximately 2,500 cars are classified over the hump daily, with between 3,500 and 4,000 cars being handled through the yard each day. Inman's receiving yard standing capacity is 2,400 cars. Under the normal three shift opeation, an average of 416 cars await classification at midnight daily.

Under the curtailed operation the average of cars awaiting classification at midnight is 5,709 cars. The capacity of the Inman receiving yard becomes exceeded during the third day of operation and all practical yard operations would have terminated by that time. The simulation, assuming a limitless receiving yard storage area, was permitted to continue through sixteen days of operation to see if any stabilizing trend would develop, but none did.

The effect on car transit times from origin to destination was also highly negative. Under normal operation in the sixteen days (simulated), the average origin to destination trip time for all cars on the Southern is 50.7 hours. Under the curtailed operation (with only Inman closed at night), the transit time increases to 56.6 hours. Cars handled directly by the Inman facility fared worse. For instance, the trip time for cars originating in the Atlanta area destined for Cincinnati increases from 47 hours to 117 hours, while the trip time for cars in the opposite direction increases from 51 hours to 139 hours. Note that these statistics reflect only those movements successfully reaching destination. A disproportionate number of cars in the curtailment study did not reach destination in the 16-day period simulated.

These results indicate that total nighttime curtailment of even one major yard facility is totally impractical. The effect of shutting additional facilities would logically be more impractical.

In the second case study an analysis was undertaken to quantify the system-wide effects of partial curtailment of operations. The nighttime classification capability at yards bordering on "non-compatible"* land uses, i.e., residential, commercial or institutional use areas, was halved. Yards bordering on "compatible"* land uses, i.e. manufacturing or undeveloped areas, were allowed to operate at full capacity in the analysis. Of the 46 yards considered in the simulation, 30 were classified as incompatible, including four hump yards.

As in the first simulation exercise, a full sixteen days of simulated operation was attempted. However, SIMTRAN terminated after nine days of operation due to the excessively large backlog of cars awaiting classification at various yards.

The sixteen "compatible" yards suffered no deterioration. One-half (15) of the "non-compatible" yards also suffered no significant deterioration of service; however, these yards handle only 18% of all cars processed on Southern. The other fifteen "non-compatible" yards which normally handle 48% of all cars processed daily on the Southern experienced severe yard congestion, with a large number of them being effectively "blocked out" by the ninth day of operation.

The conclusion that must be drawn from the second exercise is that even a minimal disruption of nighttime operations at major yard facilities has a drastic impact on system operations. Any further nighttime operating restricitons beyond these minimal measures would cause further disruption, resulting in total system shutdown.

*The "compatible" versus "non-compatible" differentiation was at one time being considered by the EPA for application of rail yard noise emission standards. The "developed" versus "undeveloped" differentiation proposed in the April 17 rulemaking is more stringent.

The third case study involved a partial curtailment of yards bordering on "undeveloped" property during the nine-hour period from 10:00 p.m. to 7:00 a.m. as specified in the proposed standards. Nighttime activities at these yards were halved as in the second case study, and daytime operations were increased to the extent possible, given practical capacity constraints. A review of yard operating capacities indicated that a ten percent increase in the level of operations is a reasonable goal.

As in the previous exercise, sixteen days of simulated operation were attempted. Again, as in the second exercise, SIMTRAN terminated, in this case after ten days of operation (as compared with nine days) due to an excessively large backlog of cars awaiting classification at various yards. Yard congestion resulted in much the same manner as in the second exercise.

The eight yards bordering on undeveloped land use as well as twenty-four of the yards bordering on developed land use suffered either no significant deterioration or none at all. However, fourteen yards bordering on developed land use and which handle 51% of all cars processed daily on Southern did experience severe yard congestion. Twelve of the yards exceeded standing capacity within ten days, if not much sooner, without showing any signs of stabilization. While the increased level of operations in the daytime did reduce the adverse effects shown in the second study, it was unable to eliminate the severe problems encountered, particularly at the four major hump yards which were curtailed. Results of this analysis support the conclusions reached in the second exercise.

The following conclusions can be drawn from the three exercises with respect to Southern's operations. First, total curtailment of nighttime classification at just one major classification yard would not only cripple that yard's productivity but would also adversely affect system operations to the point that total shutdown would occur. Second, partial curtailment of nighttime operations at yards bordering on either non-compatible or undeveloped land uses would result in a severe deterioration in service, would cripple productivity at a number of major facilities and would also result ultimately in total system shutdown. The most immediate implication of those two conclusions is that the same results would hold true for the railroad industry as a whole if any substantial curtailment of operations were undertaken -- but on a far more severe and devastating level.

The EPA's belief that third shift operations can be readily handled by first and second shifts through the employment of additional switch engines completely ignores reality. There is simply not sufficient capacity in the system to permit any significant reduction in operations during nighttime hours. Yards are designed with fixed capacities fully contemplating 24 hours per day opeations and cannot sustain processing rates significantly beyond those capacities without suffering continuing backlogs and crippling congestion. While the activity levels of yards during the daylight hours can be increased by a small percentage, the closer the yards get to the "blocking" status, the less efficient they become. Were an effort made to curtail nighttime noise, that effort would bring the nation's rail system to a virtual halt within a matter of days. Althought it is impossible to quantify all the costs associated with railroad shutdown, they would be astronomical. All would suffer: the railroads, the shippers and the public in general.

The EPA must dismiss once and for all its notion that curtailment of railroad operations is a viable alternative to meet the proposed receiving property standards. It is the industry's position that Congress never intended curtailment of operations to be treated as a noise abatement technique except in certain extremely limited circumstances. Congress was well aware of the dire implications of curtailment. In any event, the EPA cannot legally promulgate unreasonably low receiving property standards which cannot be met under the Act's criteria for rulemaking and then expect the railroads to curtail operations in an effort to meet those standards. Risking total shutdown as a noise abatement technique is made even more absurd and egregious by the fact that decreasing railroad operations by 50% would result in only a 3dB reduction in the L_{dn}, a measurable but not significantly noticeable reduction.

C. The EPA Cannot Justify the Use Of The Ldn Descriptor in the Proposed Standards

The receiving property standards proposed by EPA represent the first occasion in which the EPA would include the use of the Ldn descriptor in noise standards adopted by the agency. In the Notice EPA states that Ldn "is the primary community noise descriptor used by EPA to correlate with known effects of the noise environment on an individual and the general public" and, further, that it "has been used by EPA in all of its previous noise control regulations in assessing the health and welfare benefits of regulatory actions." (44 F.R. 22963). The fact is, however, that EPA has never used the Ldn as a descriptor in any noise regulations which it has promulgated.

In literature published by the EPA, it has expressed the objective of obtaining an Ldn of 75 dB now and an Ldn of 65 dB in the near future. This expressed objective has not been confined to railroads but applies to communities generally. However, the EPA's documents do not contain any technological or economic studies which demonstrate how these objectives can be realistically achieved. Similarly, in the current proceeding, EPA has set forth an objective but has offered no credible technological or economic analysis to justify the use of the Ldn descriptor.

It would appear that EPA views this proceeding as an opportunity to experiment with the actual use of the Ldn descriptor as a standard rather than just as an assessment device. Unfortunately, it proposes to impose this experiment on the one industry for which it would be eminently unreasonable to penalize nighttime noise. In focusing on the use of the Ldn as a metric for obtaining lower noise levels at nighttime, the EPA has ignored the operational realities of the railroad industry.

In support of the Ldn descriptor, the EPA justifies its use on the ground that it will preclude disruption to sleep. (44 F.R. 22964). However, in its haste to test the Ldn descriptor in a set of industry standards, the EPA has proposed to apply the Ldn decriptor not only to residential receiving property but also to commercial and industrial receiving properties. Application of the Ldn standard to the commerical and industrial receiving properties would impose a 10 dB nighttime penalty for properties where generally there are no people attempting to sleep. In such instances, application of the Ldn descriptor does nothing to achieve the objective which the EPA purports to achieve.

The AAR cites this indiscriminate application of of the Ldn metric not because it feels there is any justification for using the Ldn metric in yards surrounded by residential property but merely to illustrate the lack of thorough consideration given to the problem by the EPA. Because this proposed application of Ldn is inconsistent with its basic purpose and because the nature of railroad scheduling demands nighttime yard operations at a level similar to that experienced in the daytime, the proposed regulations would impose a considerable burden on the railroad industry with little resultant benefit to the public. Stated more succinctly, the proposed application of Ldn is inconsistent with the stated objective, resulting in the imposition of an unbearable burden on the railroad industry without any significant benefit to the public welfare.

The EPA's "simplified reference for determining compliance' represents another example of how the EPA's ill-advised pursuit of the Ldn metric led it to impose standards which will prove to be burdens on and which have no bearing on the stated objectives of the Ldn metric. In Tables 2.1(c) and 2.1(d) the EPA proposes the use of mathematical maximum Leq limits for specified hourly periods which are "equivalent to the Ldn 70 and Ldn 65." The hourly Leq values are said to be equivalent to a 24-hour Ldn. The EPA says that the hourly Leq standards will make enforcement easier because it is mathematically impossible to exceed the hourly Leq value and not also exceed the 24-hour Ldn standard. Thus, for example, EPA states that a measured 2-hour Leq of 81 dB during the hours of 10:00 a.m. to 12:00 noon would constitute a violation of the 24-hour Ldn 70 dB. While it may be true that a 2-hour measurement of Leq 81 dB during normal daytime working hours is the mathematical equivalent of a 24-hour Ldn in excess of 70 dB, the 2-hour Leq measurement has nothing whatsoever to do with the stated objective of the Ldn metric. EPA makes no independent analysis of the adverse impact, if any, of a 2-hour Leq 81 dB and does not acknowledge that such a measurement has any relevance other than a mathematical correlation to the objective of imposing a 10 dB penalty on nighttime noise. This is another example of the manner in which EPA's tunnel vision with respect to the Ldn descriptor would result in unreasonable and ill-considered standards.

Furthermore, from a technical standpoint, the EPA has not adequately considered the complexity of measuring railroad noise sources at the receiving property in relation to outside noise sources. Most of the EPA's previous efforts to set noise standards involved measurements of simple sound level values at one or more fixed measurement positions relative to simple well-defined sources. The sources regulated have been of the same general type and the duty cycle of the source has been well specified. Thus, the measurement procedures involved in determining compliance and the noise control options available to achieve compliance have been rather straightforward.

In the present case in which regulations are proposed to control the noise emission from railroad yards, the situation is considerably more complex. A simple source is not being regulated but rather a multitude of various types of sources must be considered. The duty cycle of the sources are not constant or well defined nor are their positions fixed relative to the measurement point. Because the Ldn acoustic metric is not an instantaneous sound level measurement but rather represents a temporal average over an extended time period, it becomes impossible to exclude measurement of noise from non-railroad sources. In its haste to use the railroad industry as the "test" industry for application of the Ldn metric, EPA neglected to adequately consider and deal with these complexities.

IV. Health and Welfare Impact

In the Notice (at 44 F.R. 22963 et seq.) the EPA attempted to describe the need for a health and welfare analysis in setting standards for noise emissions. It argued it was justified in assessing the public health and welfare impact of its proposed noise emission standards so that it would have a "target" or a "noise control objective." It indicated that the judgment of whether the proposals (including the standards, the abatement techniques, and the costs) were reasonable was to be based on an assessment of the current impact of railroad noise on the public health and welfare and on a measure of the extent to which the proposed standards would result in public health and welfare benefits.

There are two serious problems in the EPA's approach. First, the EPA exceeded its statutory mandate by going beyond the use of the analysis of health and welfare impacts as a "target" or "objective" upon which to judge technological efficacy and reasonableness of cost. Instead it chose the Ldn descriptor as the receiving property standard solely on the basis of the health and welfare criterion, to be applicable to all adjoining land uses but undeveloped. The importance of this choice is clear to all. The EPA itself calls it "them most stringent of the standards required under this proposal" (44 F.R. 22964, left column). Yet in relation to the criteria specifically authorized in Section 17 -- best available technology and cost of compliance -- choice of the L_{dn} descriptor as opposed to the L_{eq} descriptor is completely arbitrary. Beyond being arbitrary, the artificial penalty on nighttime operations that the L_{dn} descriptor imposes will result in a standard which cannot be achieved, in many cases, even <u>with</u> application of that technology which exists unless there is also adoption of severely curtailed nighttime operations.

Protection of the public health and welfare is clearly the goal of the statute. The AAR does not dispute this. Despite what the EPA has said (44 F.R. 22963, top left column), the AAR does not contend that public health and welfare impact is to be "totally absent" from consideration. The AAR does contend that public health and welfare impact is not a valid criterion for setting standards and certainly is not the sole criterion for choice of descriptor.

The AAR does suggest that the EPA will best protect the public health and welfare by doing the job it was assigned to do under the statute: look clearly, now and in the future, for what technology can really do, at costs which are reasonable, to reduce railroad equipment and facility noise; and based on what it learns, set standards to see that what <u>can</u> be done <u>is</u> done. This is the way to attain the objective of the Act. With the objective achieved, the public health and welfare will be served in the broadest sense.

The second serious problem with the EPA's approach relates to the EPA's health and welfare impacts, both current impact of railroad noise and impact after implementation of the proposed standards. The measurement was faulty. This resulted in unreasonable, unjustifiable, and arbitrary railroad facility noise emission standards. The following examples clearly demonstrate the inadequacy of the analysis by EPA of health and welfare impacts.

EPA attempted to measure the number of people currently affected by railroad noise. It used statistical models to determine noise exposure and concluded that about four million people in the United States are exposed to day-night average railroad yard noise levels of 55 L_{dn} or greater. Because of errors. ambiguities and unsupported assumptions, EPA's analysis of the health and welfare impact results in an estimate which almost certainly overstates the number of people currently affected by railroad noise. In addition, the assertion that compliance with the proposed standards would benefit about 830,000 is clearly an overestimate since the EPA does not take into account in its analysis the effect of other community noise sources.

In an inaccurate and misleading statement, EPA suggested that its action would "provide an environment free from railroad noise that jeopardizes the health and welfare for 830 thousand of our Nation's people." EPA had absolutely no possible basis for suggesting that railroad noise might "jeopardize" public health. Indeed, the available data support a finding that railroad noise does not "jeopardize" public welfare. Considering the low levels of railroad noise cited in the Background Document, a more reasonable conclusion would have been that, at most, railroad noise is capable of constituting an annoyance -- at some locations some of the time.

EPA used a mathematical model to predict existing railroad yard noise impact and the impact expected if its proposed standards are finally promulgated and implemented. In this mathematical model, EPA committed several errors resulting in overestimates of population exposure and generally discrediting the validity of the model's results. The most significant deficiency in the model was the EPA's failure to consider noise from non-railroad sources. As long as the model predicted railroad noise to be in excess of L_{dn} 55 dB, it was assumed that the people within that range were affected by railroad noise. However, if the non-railroad noise exceeds the railroad noise level by 3 dB or more, the railroad noise should not be identified as having an adverse impact. Significantly, EPA's data show community noise to be at levels above those produced by railroads. Furthermore, any reduction of the railroad noise levels to values less than 3 dB below the level due to non-railroad noise sources will produce little benefit.

The impact of noise in a community is a function of all the noise it hears, not just of one component. This is a particularly significant consideration which the EPA ignored in attempting to measure the effect of changing a single component of the total noise level. Its model included people as benefiting from the reduction in railroad noise even in circumstances in which a complete elimination of railroad noise would have little or no impact on the community. Such would be the case where the railroad noise in a community is more than 3 dB below the sum of the noise contributions from non-railroad sources. (Exhibit A, pp. 28-29.)

The EPA's decision to consider only railroad noise in its model constitutes a serious deficiency. Non-railroad noise was the dominant source in four out of ten railroad yard sites for which there were available data describing relative contributions of each noise source to the total hourly L_{eq}. In two of the other sites, non-railroad noise was a major contributor to the hourly L_{eq}, with airplane flyovers and traffic noise being the largest non-railroad noise contributors. (Exhibit A, p. 30.) EPA's failure to include the non-railroad noise sources makes it impossible to calculate accurately the reductions in the effective number of people affected. Another serious error was to count the estimated number of people in certain areas twice. (Exhibit A, p. 29 and p. 33.)

It is absolutely impossible to estimate the reliability of any of the values arrived at in calculating the "effective number of people impacted." Throughout the entire impact analysis there is no consideration given to the statistical accuracy of the model. Questionable estimates are made, and at no point in the Background Document are error bounds presented or their implications discussed.

Exhibit A contains a discussion of several examples of the failure of the EPA to determine the accuracy of the predictions developed through the model. The accuracy of distances estimated between railroad noise sources and the receiving property is so questionable that little or no confidence can be placed on the estimate of the effective number of people impacted. (Exhibit A, p. 30 and Tables 4-1 through 4-4.) The activity rate of a rail yard was estimated solely on the basis of physical size despite the fact that size is not always indicative of activity. (Exhibit A, p. 33.) The manner in which the EPA distinguished between switch and road locomotives was completely arbitrary. The model assumed a uniform population distribution around yards, which is also an invalid assumption. Yet it is one which results in an overstatement of the number of people in the areas of high railroad yard noise and in an unrealistically high estimate of the effective number of people impacted. (Exhibit A, p. 34.)

EPA's enlargement of the study area to "include at least one population centroid" of the census data (Background Document, p. T-1 of Appendix T) in its estimate for yards in scarcely populated areas arbitrarily increased the value used for the constant population density around such a yard. If so few people live in the vicinity of the yard that EPA felt compelled to enlarge the study area, it is unlikely that very many of the people in the enlarged area live in the immediate vicinity of the yard. (Exhibit A, pp. 34-35.) Simply stated, EPA cannot assume a constant average population density in the immediate vicinity of a yard where there were so few people residing that it was necessary to enlarge the study area. Yet that is what EPA did and it necessarily resulted in an overestimate in the effective number of people impacted.

The EPA also indiscriminately assumed a constant distribution of population around all yards even though many are located in industrial areas. To the extent yards of certain types are located primarily in industrial areas which are scarcely populated, the EPA's assumption again overestimated the population densities around such yards. (Exhibit A, p. 35.)

As stated above, the errors, statistical inaccuracies, and questionable estimates associated with the mathematical model have resulted in unreliable and unacceptable predictions of railroad yard noise impact for present noise levels and for proposed regulatory receiving property levels.

To the extent the EPA claims that there is a noise problem to be cured (i.e., 4 million people in the United States exposed to day-night average rail yard noise levels or greater), it is a statistical problem created by EPA. No confidence can be placed in this estimate. To the extent EPA uses its estimate of the number of people benefiting from the proposed standards as evidence of their effect, it is a statistical cure. Overestimates in the projections of current impact are objectionable since they give incorrect and exaggerated impressions of the overall importance of current railroad noise. Overestimates in the projections of the reduction in impact that is actually achievable are even more objectionable since they can lead to expenditures of large amounts of money on noise control which ultimately will produce little benefit to the community. The EPA's analysis suffers from both of these objections, with its "manufactured" conclusions standing in marked contrast to the Agency's earlier position that "railroad noise has not been identified as one of the major sources of noise in the environment." 41 F.R. 2189 (January 14, 1976).

V. Measurement Methodology

There are four major areas of the EPA's proposed measurement methodology that contain serious weaknesses. Promulgation of the proposed noise standard without correcting these problems would constitute a flagrant misuse of regulatory authority.

First, in describing the methodology to be used in measuring the sound levels from retarders, mechanical refrigerator cars, and car impacts, the effects of a wide variety of factors such as instrument accuracy tolerances, reflecting objects near the source, competing noise sources, ground surface and contours, and wind conditions -- all of which are known to have important influences on the accuracy of sound level measurements -- are not fully examined. Since most of these factors cannot generally be controlled in a railroad yard, a considerable margin of tolerance must be permitted above the proposed regulatory levels to allow for increased noise levels due to these effects.

Second, the EPA has given incomplete instrumentation specifications for the integrating sound level meters to be used in measuring the Leq and Ldn at points exterior to the yard. At present, no national or international standards on integrating sound level meters exist for such equipment. While some integrating sound level meters are commercially available, specifying a requirement for such instrumentation in a Federal regulation, prior to the availability of accepted national standards, is technically unsound. Furthermore, the specifications given in the NPRM are inadequate to define properly the operating characteristics of such equipment in lieu of a standard.

Third, by allowing Leq and Ldn measurements to be made at a distance of 2 meters from a residential dwelling surface, a point at which reflections from the surface contribute approximately one-half of the total acoustic energy, the proposed regulatory level is effectively being reduced by about 3 dB. Thus, if a measurement is made at such a position, the effective (free field) regulatory levels of Ldn 70 and the Ldn 65 become Ldn 67 and Ldn 62, respectively. If this is indeed the intent of the NPRM, it should clearly be stated as such, rather than being hidden as an artifact of the measurement procedure.

Finally, the procedure for determining "clear dominance" and "dominance" of the railroad yard noise component has been carefully studied and shown to be inadequate in its present form. The tolerances that would have to be allowed to take into account the uncertainties in all the model calculations involved, are so great as to make the procedure essentially unworkable.

A more detailed lisiting of specific objections to the EPA's proposed measurement methodology is set forth on pages 37-43 in Exhibit A.

VI. Financial Impact

A. Present Industry Financial Condition

Any analysis of the ability of the railroad industry to meet the additional plant and operating expenditures required to comply with the EPA's proposed noise abatement standards must proceed from an evaluation of the industry's current financial condition. A brief review of recent trends will serve to put that unhappy picture in perspective.

Since 1958, railroad industry total ordinary net income has fallen at an annual rate of 4.1%. See Table 1 The protracted steep decline in railroad earnings is even more dismal when adjusted for higher levels of operation, the substantial portion of earnings contributed by non-rail sources, and the declining buying power of the dollar. See Tables 2 and 3 . Industry earnings per ton mile nave fallen a dramatic 72% since 1958, when the 2.23% annual growth in traffic is taken into account. Regional earnings per ton mile have dropped 45% in the East, 8% in the South, and 23% in the West. These results would have been more severe had they not been buoyed by earnings from outside operations.

The railroad industry, like all business and consumers, is not shielded from the lower purchasing power brought on by inflation. When inflation is taken into account even the historic earnings of the strongest carriers quickly falter. Measured in 1958 dollars, ordinary income for the southern roads in 1978, would be $76.8 million or 43.5% of their 1958 results. Western roads would experience

Table 1

CLASS I RAILROADS

NET INCOME (ORDINARY)

(Millions)

	United States	Eastern District	Southern District	Western District
1958	$ 601.7	$ 140.9	$ 98.7	$ 362.1
59	577.7	142.5	101.8	333.4
60	444.6	81.0	81.7	282.0
61	382.4	(2.7)	84.0	301.2
62	571.0	81.6	118.0	371.4
63	651.6	132.7	114.8	404.2
64	698.2	176.1	117.4	404.7
65	814.6	243.8	124.2	446.7
66	903.8	285.1	141.4	477.3
67	553.8	94.1	126.1	333.6
68	569.4	67.4	117.1	384.9
69	514.2	21.3	139.4	353.5
70	226.6	(276.3)	159.5	343.4
71	246.7	(273.6)	151.7	368.7
72	318.6	(192.0)	173.4	337.2
73	359.3	(179.2)	183.2	355.4
74	730.2	(52.2)	294.8	487.6
75	144.4	(345.3)	189.3	300.4
76	355.0	(357.5)	258.9	453.5
77	424.8	(346.3)	286.3	484.8
78	259.3	(458.4)	176.6	541.7

(Parentheses indicate deficit)

Table 2

CLASS I RAILROADS

REVENUE TON MILES

(Ton miles in millions)

	United States	Eastern District	Southern District	Western District
1958	551,667	213,169	83,662	254,836
59	575,529	217,894	88,949	268,685
60	572,309	217,731	87,691	266,887
61	563,361	208,550	87,873	266,938
62	592,862	220,216	95,829	276,818
63	621,737	230,382	102,532	288,823
64	658,639	244,691	108,316	305,631
65	697,878	259,477	116,836	321,564
66	738,395	265,504	125,462	347,429
67	719,498	258,361	127,988	333,149
68	744,023	259,391	130,686	353,946
69	767,841	259,827	139,256	368,757
70	764,809	254,467	140,034	370,309
71	739,404	225,433	139,650	374,321
72	776,746	231,221	147,116	398,410
73	851,809	245,022	157,879	448,907
74	850,961	248,398	160,668	441,985
75	754,252	217,909	140,261	396,083
76	794,059	216,644	151,020	426,395
77	826,292	211,278	160,689	454,326
78	858,105	197,633	162,417	498,056

Table 3

CLASS I RAILROADS

NET RAILWAY OPERATING INCOME
(Thousands)

	United States	Eastern District	Southern District	Western District
1958	$ 762,296	$ 234,743	$ 139,577	$ 387,976
59	747,677	262,152	137,547	347,978
60	584,016	176,742	113,353	293,921
61	537,771	99,584	122,641	315,546
62	725,679	196,571	157,884	371,224
63	805,658	242,878	152,445	410,336
64	818,213	270,381	155,416	392,416
65	961,516	351,197	164,246	446,072
66	1,045,863	384,574	183,191	478,098
67	676,434	174,627	164,284	337,523
68	677,623	139,690	164,445	373,489
69	654,670	118,700	185,102	350,868
70	485,854	(101,603)	207,750	379,707
71	702,011	(25,986)	236,575	491,422
72*	653,827	11,677	223,937	418,214
73*	649,828	7,491	227,746	414,591
74*	768,106	47,133	245,454	475,519
75*	350,681	(225,253)	216,505	359,429
76*	451,832	(305,953)	257,532	500,253
77*	442,676	(396,334)	301,709	537,301
78*	442,718	(506,086)	320,448	628,356

(Parentheses indicate deficit)

* Reflects inclusion of deferred taxes.

similar results, with the greatest portion of their $126.5 million decline in real earnings occurring in the past decade. This erosion of real earnings due to inflation has affected the rail carriers' struggle to maintain and modernize their plants. Increasingly, the industry has not been able to fund capital expenditures with internally generated sources of funds. Adjusted for inflation, the $2.776 billion spent for capital expenditures in 1978 is 15% greater than actual 1968 capital expenditures. Yet these expenditures have not been able to eliminate the current backlog of $5.5 billion delayed capital and maintenance expenditures for the industry.

The erosion of railroad earnings over the past decade has resulted in disproportionate increases in debt, industry equipment, and rents. The industry has experienced a 177.2% increase in fixed charges, with the fixed charge coverage ratio falling from 2.38 in 1968 to 1.42 in 1978.

Although the industry has been able to secure equipment financing, it has by and large been unable to attract external private capital. With some exceptions, railroad earnings and returns are too low to attract new equity or debt other than for equipment or rollover of old debt. Existing mortgage debt is secured by industry earnings and the liquidation value of the assets with most railroad plants currently being fully encumbered.

Many railroads have been forced to use working capital to finance capital expenditures. As a result, total net working capital for the industry, excluding the current portion of long-term debt, has dropped 42% from $995 million in 1958 to $575 million in 1978. Even then it has been federal financial assistance to Conrail and Title V programs which partly reversed the dramatic plunge of 93% from $995 million in 1958 to $68 million in 1975.

The rates of return enjoyed by the railroad industry have indeed been dismal. (See Table 4.) The industry's present earnings on its assets is a trifling 1.62%, down from 2.44% in 1968 and 2.76% in 1958. Correspondingly, the industry's return on equity has fallen from 3.51% in 1958, to 3.17% in 1968 to 2.26% in 1978. See Table 5. Table 4 highlights the industry's return on investment performance for the past decade as well as the returns experienced within each of the three key regions. Even the Southern District which has been the leader within the industry, with a high of 5.44% in 1978, has not had a return on net investment which exceeds the industry's embedded cost of senior capital estimated at 6.6 percent. The railroads reported by individual districts as a whole have fallen far below the 11.0 to 11.6 percent return on investment determined by J. Rhoads Foster in Interstate Commerce Commission Docket No. Ex Parte 338 as a fair rate of return necessary to attract and retain adequate amounts of capital over the long term. Furthermore, rail industry performance is also below the position expressed by an ICC coordinator in ICC Docket No. Ex Parte 271; i.e., "that a 6 to 10 percent overall target rate of return would not be unreasonable..."

Table 4

RATE OF RETURN ON NET INVESTMENT

Year	United States	Eastern District	Southern District	Western District
1958	2.76%	2.00%	3.68%	3.20%
1967	2.46%	1.58%	3.86%	2.75%
1968	2.44	1.27	3.79	3.01
1969	2.36	1.10	4.17	2.81
1970	1.73	Def.	4.50	3.02
1971	2.12	Def.	4.36	3.51
1972	2.34	0.11	4.61	3.34
1973	2.33	0.07	4.61	3.30
1974	2.70	0.46	4.73	3.66
1975	1.46	Def.	3.86	2.77
1976	1.52	Def.	4.43	3.29
1977	0.89	Def.	4.95	3.27
1978	1.62	Def.	5.44	4.40

NOTE: Rate of return figures, beginning with 1971, reflect ICC modifications requiring inclusion of deferred taxes. Beginning with 1975, the return is based on net investment less deferred taxes (Sch. A, line 21b) and NROI less investment tax credit. (Sch. A, line 12b).
For the years 1967-74, data are based on the consist of Class I railroads for each respective year; beginning with 1975, statistics are based on the 1979 Class I consist excluding the Long Island Rail Road Company.

Source: Interstate Commerce Commission, TRANSPORT STATISTICS IN THE UNITED STATES and annual reports of railroads (R-1), except that data for 1975-78 are computed from the Schedule A summaries.

TABLE 5

RATE OF RETURN ON SHAREHOLDERS' EQUITY

Class I Railroads in the United States

(Dollar amounts in millions)

Year	Income Before Extraordinary Items a	Shareholders' Equity (End of Year)	Return on Equity
	1	2	3
1958	$601.7	$17 142.3	3.51%
1967	$553.8	$17 973.4	3.08%
1968	569.4	17 983.8	3.17
1969	514.2	17 768.8	2.89
1970	226.6	17 323.3	1.31
1971	246.7	16 567.6	1.49
1972	318.6	16 110.3	1.98
1973	359.3	16 338.5	2.20
1974	730.2	14 944.9 b	4.89
1975	262.9	14 812.4 b	1.77
1976	457.9	15 123.1 b	3.03
1977	417.1	15 624.4 b	2.67
1978	363.2	16 092.5 b	2.26

a Income before extraordinary items as recorded under accounting regulations in effect each year.

b Adoption of general accepted accounting principles (GAAP) in 1974 had the effect of reducing shareholders' equity.

NOTE: For the years 1967-74, data are based on the consist of Class I railroads for each respective year; beginning with 1975, statistics are based on the 1979 Class I consist excluding the Long Island Rail Road Company.

Source: Interstate Commerce Commission, TRANSPORT STATISTICS IN THE UNITED STATES, annual reports of railroads and OS-B reports.

Certain carriers are in a more financially tenuous position than other carriers and their particular situation must not be ignored. The seriousness of their state of affairs has been acknowledged and publicly commented upon by the Interstate Commerce Commission and the U.S. Department of Transportation.

The U.S. Department of Transportation highlighted the dilemma of a collection of carriers (excluding Conrail) from the eastern and midwestern section of the nation in its October, 1978, report entitled, "A Prospectus for Change in the Freight Railroad Industry."*/ These carriers are estimated by the DOT to comprise 23.9% of total industry revenues (less Conrail). Over the next ten years, the DOT has forecast that the industry will be unable to generate about $16.2 billion in capital it needs to maintain the status quo as of 1976 and that the marginal carriers account for about $7.7 billion of this shortfall or 47.8%. Clearly, carriers comprising a large proportion of the industry (24% of projected revenues) that are already in a financially tenuous position will be confronted with an ever-worsening position. In fact, the DOT predicts that this group of carriers will be faced with a capital shortfall equal to 24.4% of all their projected revenues over the 1976 to 1985 time period.

Given the difficulties inherent in forecasting, various estimates of the railroad industry's capital needs have been made in recent years by the industry, the ICC, the DOT

*/ The EPA is specifically requested to take official notice of this Department of Transportation report.

and many others. While each of these studies has employed somewhat different sets of assumptions regarding base years operations and costs, future traffic levels, differential inflation rates and productivity gains, as well as equipment use and service lives, all have independently concluded that the industry will require tremendously higher levels of capital expenditures than present and that internal funds will be insufficient across all regions.

B. Critique of EPA's Analysis and Projected Costs of Compliance

There are several aspects of EPA's noise abatement financial analysis which cannot be accepted. They include EPA's treatment of the number of yards affected, the unit costs for the capital items required by the recommended various noise abatement techniques; the annual operating, maintenance, and monitoring costs associated with such techniques; and the financial impacts on individual rail carriers and on the industry. The following is a critique and comment on EPA's overall approach, its capital and annualized cost estimates, and its employment and interpretation of price elasticity considerations.

1. EPA's Overall Approach

While the EPA has developed models for measuring the costs and benefits for a series of yard noise abatement procedures, the Agency has only examined these costs and benefits based on a hypothetical, medium-activity yard. However, it is quite clear that this hypothetical yard does not accurately represent the overall operations of a particular railroad, nor that the cost of compliance in a low activity environment would offset the cost of compliance in a high activity environment. In addition, the lack of uniformity and variability surrounding the number, type, and activity levels of yards; surrounding land use character; population density; ambient noise levels; construction and maintenance costs; labor agreements; and geographic differences between railroads casts considerable doubt upon the suitability of using any generalizations regarding noise control and cost effectiveness.

While the industry contends that EPA should assess the noise abatement costs in a proper manner for each carrier before promulgating a final standard, it does agree that the use of industry-wide average unit costs and activities when appropriately identified and applied does have merit for evaluating noise abatement procedures in a planning environment. Likewise, if EPA had properly determined the appropriate unit capital and incremental operating costs and the number of affected yard facilities and equipment, they surely would not have concluded that the total costs to the industry for attainment of a stringent 70-65 Ldn noise standard would be nominal. Upon close examination of the EPA assumptions and costs, the rail industry has found numerous deficiencies, inconsistencies, and underestimates. Because of these elements, EPA has calculated excessively low capital costs and understated total annual compliance costs.

Preceding any derivation of cost estimates, the AAR undertook a comprehensive engineering and operations analysis which led to a more exacting development of all the incremental costs. This analysis included the collection of railroads' and contractors' estimates on costs and lifecycles. Detailed facility engineering designs, operational problems and incremental costs were estimated by the carriers for retrofitting a sample number of existing yards. These detailed, carrier-estimated, incremental unit costs were then applied to the inventory of yard equipment and facilities to develop the cost of implementing the abatement techniques based only on the assumptions which underlie EPA's Tables 4.3 and 4.4.

2. Correction of EPA's Compliance Costs

Table 6 compares EPA's estimates of unit costs, in 1979 dollars*/, with the AAR's unit capital and operating costs' estimates for the proposed noise source abatement procedures based simply on a restatement of EPA's Tables 4.3 and 4.4. Table 6 clearly shows that EPA significantly underestimated the real incremental unit costs across all abatement categories. On a good comparative note, AAR found no discernible difference in EPA's expected economic lives for the suggested abatement techniques as evidenced in Table 7.

The understatement of unit cost continues in the

*/ EPA's cost data is not explicit as to what year's dollar levels are assumed, and EPA makes comparisons to the railroads' 1977 results. Nevertheless, EPA has stated that their estimates are in 1979 dollars.

TABLE 6

COMPARATIVE UNIT COSTS OF ABATEMENT METHODS

(Expressed in 1979 Dollars)

ITEM	EPA COST	EPA O+M	AAR COST	AAR O+M
Releasable Retarders	10,000	1,000	40,000	4,000
Switch Engine Modifications	1,200	232	20,880	2,088
Retarder Barriers Master	22,500	1,125	60,000	6,000
Group	15,000	750	40,000	4,000
Load Cell Enclosures	90,000	9,000	500,000	50,000
Mechanical Refigerator Car	110	14	5,000	500
Low Noise Brakeshoes	0	16,000	0	16,000
Yard Measurement	10,000*	549-2049**	10,000*	4,549**

* Per Instrument Set
** Per Yard Measurement

TABLE 7

COMPARISON OF PROJECTED USEFUL LIFE
(IN YEARS) OF ABATEMENT TECHNIQUES

ITEM	EPA	AAR
Releasable Retarders	10	10
Switch Engine Modifications	5	10
Retarder Barriers	10	10
Load Cell Enclosures	30	30
Mechanical Refrigerator Car Modifications	5	15
Low Noise Brakeshoes	less than 1	less than 1
Measurement Instrumentation	5	5

EPA's computation of the industry's total capital costs, which is contained in Table 8. EPA's estimate of $90.7 million*/ is only 17% of AAR's estimate of 532.9. Likewise, when current annual effective finance charge rates of 12%**/ are applied, amortized over the economic life along with the proper associated annual operating and maintenance costs, annualized industry total costs are estimated by the AAR to be $143 million for the AAR compared with $27 million***/ for the EPA, as shown in Table 9.

The cost comparisons shown on Tables 6, 8 and 9 do not reflect all of the costs the railroads would incur if they were required to attempt to comply with the standards as proposed. The costs identified by the AAR only constitute a restatement of the erroneous costs contained in Tables 4.3 and 4.4 of the Notice. These cost estimates do not begin to measure the actual costs which would be incurred if the railroads actually were forced to meet the proposed standards. As stated in the various sections of these comments, the actual costs are virtually impossible to estimate, but they would be substantially higher than the costs here reported.

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*/ EPA apparently made an arithmetic or transcription error since its exhibits add up to only $89.8 million.

**/ Based on economic projections of the prime rate varying between 9 and 11% and the industry's inability to finance fully secured equipment debt much less than 1+ percentage points above prime, a finance cost of 12% compared to EPA's 10% is chosen as more appropriate.

***/ EPA's exhibits add up to $41.2 million, not $27 million.

TABLE 8

COMPARATIVE YARD NOISE ABATEMENT ESTIMATED*
CAPITAL COSTS, BASED ON TABLES 4-3 AND 4-4
(Expressed in millions of 1979 dollars)

ITEM	EPA	AAR
Releasable Retarders	40.0	132.2
Switch Engines	7.9	145.6
Retarder Barriers	14.0	41.6
Load Cell Enclosures	19.4	89.5
Mechanical Refrigerator Cars	2.6	118.1
Low Noise Brakeshoes	0.0	?
Yard Measurement	5.9	5.9
Totals	89.8	532.9

*This Table includes the measurable incremental costs associated with barrier installation, locomotive fleet retrofit, and mechanical refrigerator car rebuilding.

TABLE 9

COMPARATIVE YARD NOISE ABATEMENT ANNUALIZED
CAPITAL COSTS, BASED ON TABLES 4-3 AND 4-4*
(Expressed in millions of 1979 dollars)

ITEM	EPA	AAR
Releasable Retarders	10.5	36.6
Switch Engines	3.6	40.3
Retarder Barriers	3.0	11.5
Load Cell Enclosures	4.0	20.1
Mechanical Refrigerator Cars	0.3	29.1
Low Noise Brakeshoes	13.9	13.9
Yard Measurement	5.9	20.8
Totals	41.2	162.3

*This Table includes the measurable incremental costs associated with barrier installation, locomotive fleet retrofit, and mechanical refrigerator car rebuilding.

Presentation of these cost estimates in Tables 6, 8 and 9 does not presume that the abatement techniques identified could actually be implemented at those costs. They could not! The comparative costs have simply been presented to show EPA's failure to use realistic cost estimates even in its limited and erroneous view of the feasibility of implementing the recommended abatement techniques.

3. <u>Price Elasticity Consideration</u>

The understated industry unit and total cost estimates were carried forward by EPA and applied in a freight price demand elasticity impact model. The results of this application led EPA to the conclusion that such annual compliance costs were relatively modest and that the industry could easily obtain a nominal general rate increase from the ICC to recover fully the carriers' costs without any significant traffic diversions and employment losses. Again, the EPA was fundamentally incorrect in its assumptions. As previously noted, EPA substantially underestimted the annualized real incremental compliance costs to the industry. Conceivably, if these true compliance costs were applied in EPA's industry economic demand impact model, one could expect the required rate increases and subsequent traffic diversions and employee losses to grow proportionately to a substantial level. The magnitude of these increases should cause the EPA to reverse its stand.

However, the EPA's industry commodity price demand elasticity model is not a true representation of the market reactions to a uniform increase in rail freight rates for a carrier. The rail price elasticity quantitative evidence and research to date has been minimal and clearly inadequate for any understanding of the consequences of a uniform application in the dynamic transportation environment. While the general transportation demand curve formulae derived by the economic theorists are conceptually sound, they require for validity a plethora of precise, discrete data developed at the regional market level. In the rail industry, this requires a comprehensive quantitative analysis of each carrier's projected position with respect to changes in each individual commodity group affected by changes in technology and distribution, relative freight prices to delivered prices, relative levels of modal services and share and product cross elasticity of substitution. To do less, such as aggregating and grouping commodities, averaging prices, using national values, and disregarding modal competition, only causes grave distortions at both the individual carrier and the industry levels.

Unfortunately, the EPA took the "do less approach" in deriving the potential economic impacts on the carriers. They supported their use of this aggregate industry type elasticity demand analysis by asserting a lack of complete and decisive empirical studies of demand responses to price change for individual markets and railroads. Furthermore, the EPA determined that the elasticity studies performed for the ICC for evaluation of the 4R Act ratemaking provisions were totally adequate and therefore could be fully incorporated in those estimates. However, EPA did not consider the intent of the ICC's elasticity analysis. The ICC clearly states in its report that the 1975 rail elasticity analysis developed only rough empirical estimates, which were estimated solely to illustrate the potential industry benefits derived from selected rate increases. The ICC further states that "the actual benefits, however, depend largely on the nature of the individual markets in which a carrier is contemplating rate actions, successful use of this tool is intricately tied to the individual carrier's ability to evaluate the market impact of such changes. It does not consider the unique demand and market conditions operating by individual carriers and that the analysis is predicated on the 1975 level of market competitiveness."*/ Nonetheless, the EPA applied the averaged industry demand factors uniformly and ascertained that little variability exists among carriers. This is not unexpected since EPA did not attempt to differentiate between the carriers based on their actual commodity mixes and relative modal strengths. With each rail carrier operating as a part of a dynamic industrial process any and all projected changes in the regional and national economic climate, institutional structures, shipper logistical patterns, technology, and competition significantly affect future rail demand. These problems cause individual rail carriers to receive inequitable treatment from EPA's demand elasticity

*/ ICC Report to Congress; p. 108.

measurement analysis. Furthermore, the concept of adding rate increases to the already substantial relative increases required to recover from inflationary forces adds to the invalidity in applying these elasticity methodologies to the subject at hand.

4. Inability of Industry to Pass Through Total Cost Increases

a. Shortfalls due to competition

General rate increases are and have been the basic mechanism employed by the industry to recoup industry-wide cost increases. Cost increases due to inflationary forces are a classic example of what general increases have attempted to recoup. However, general rate increases have been insufficient to offset the full effects of inflation because they are always limited by the extent to which competition will permit the railroads to increase revenues and retain traffic.

Of the 16 general rate increases authorized in the past decade, only two have allowed for a higher level of earnings. The two exceptions were Ex Parte Nos. 267 and 305 which were intended to recoup prior years' shortfalls. The need for cash simply overtook the need to avoid erosion of the revenue base. Stated differently - short-term priorities had to be met even at the expense of the long-term consequences.

The great majority of these 16 general increases have fallen short of even offsetting the full extent of cost escalation. Even with improved productivity, rail revenue levels have remained substandard because inflation has outstripped increases in both rates and efficiency and competition has denied the opportunity to recoup such increases. The following table identifies each general increase and shows the extent to which the revenue yield exceeded or fell short of offsetting higher costs of operations. (Table 10)

It is readily apparent from Table 10 that the industry has been unable to pass through cost increases largely due to competitive considerations. Furthermore, column (7) does not acknowledge the effects of actions taken by State regulatory bodies and industry's final decisions on what rate increases to pass on. Each of these actions further depresses the effective levels of cost recovery.

b. Shortfalls due to national policy

The industry recently requested a rate increase of 8.1% which was viewed by the Council on Wage and Price Stability (COWPS) as inconsistent with its inflationary guide-liens. Under pressure from COWPS, the industry depressed its proposed increase to an effective 7.0% level. Obviously, full cost increases, justified by inflation alone, are not feasible because of this national policy. Certainly, this alone negates the concept of passing any incremental expenses based on environmental rules which will be over and above the 7.0% guideline. In fact, based on existing economic forecasts, it will be some time before the 7.0% restriction will be greater than the level of cost increases due to inflation. Therefore, railroads will not be able to recoup environmentally related costs through a rate increase.

Annual Shortfall between Costs Submitted and Increases Proposed and Authorized (See note g)

Table 10

ICC Docket (1)	Effective Date (2)	Total Costs Submitted (millions) (3)	Increase Proposed (millions) (4)	Increase Authorized g (millions) (5)	Proposed Shortfall (3) - (4) (millions) (6)	Actual Shortfall (3) - (5) (millions) (7)
EP 256	8/19/67	$ 441	$ 337	$ 307	$ 104	$ 134
EP 259	2/15/69	528	479	463	49	65
EP 262	11/18/69	841	619	614	222	227
EP 265	11/20/70	897	638	638	259	259
EP 267	4/12/71	45	1 440	1 300	(1 395)	j (1 255)
EP 281 a	10/23/72	d 1 617	489	426	1 128	1 191
EP 295	8/19/73	930	570	h 395	360	535
EP 299 b	3/16/74	386	375	361	11	25
EP 301 c	6/01/74	490	i 482	i 482	16	16
EP 303	3/09/74	702	664	587	118	195
EP 305	6/20/74	379	i 1 475	1 328	(1 096)	k (949)
EP 310	7/09/75	e 1 622	999	i 899	e (57)	e 43
EP 313	10/11/75	1 146	1 154	i 954	(8)	192
EP 318	E&S 3/21/76 W 4/18/76	1 182	424	424	758	758
EP 330	10/07/76	f 1 111	426	426	(426)	f (426)
EP 336	1/07/77	995	694	i 659	301	336
EP 343	11/30/77	1 096	939	l 917	157	179
EP 349	6/17/78	929	719	m 652	210	277
EP 349 (sub 1) n	12/20/78	-	24	22	(24)	(22)
EP 357	12/15/78	1 138	1 512	1 439	(374)	(301)
Cumulative annual shortfall					313	1 479

a Increases shown for EP 281 include deferred increases authorized on goods transported for recycling.
b Authorized under expedited procedure pursuant to PL 93-69 to cover increased Railroad Retirement taxes.
c Published under authority of ICC Special Permission No. 74-1825 to cover increased fuel costs.
d 341 ICC 300, 301. Railroads requested a 4% increase estimated to generate $489 million.
e Includes shortfall of $680 million from EP 295 and EP 303, not double-counted in columns (6) and (7). See EP 310 Railroads; Brief, January 29, 1975, p. 9.
f Same costs as submitted in EP 318 at different traffic and employment levels. Shortfall in EP 318 offset by increase in EP 330.
g Amounts shown are rough approximations of general increases authorized and assumes comparable increases in intrastate revenues, after allowing for specified exceptions and holddowns authorized by the ICC. These increases do not reflect subsequent rate adjustments by individual railroads or groups of railroads.
h In its final decision, the ICC approved only the allowed interim increase of 3%.
i Calculated
j "Respondents are in need of additional revenue from their interstate freight rates and charges to offset recently incurred and prospective increased operating costs and to provide an improved level of earnings." Decision 3/4/71, p. 257.
k The ICC determined that 3 percentage points of the increase could be applied to increased material and supply costs, excluding fuel, if such costs were incurred. The remainder must be applied to the reduction of deferred maintenance and delayed capital improvements. See Order dated 7/24/74, p. 3.
l Including rollbacks required by ICC decision 6/28/78.
m Including rollbacks required by ICC decision 1/16/79.
n Ex Parte 349 (Sub 1) applied to Eastern District only.

January 31, 1979

c. Inequity in industry-wide pass-throughs

i. Shipments which bypass yards

Uniform application of any rate increases sought to recoup the proposed environmental cost increases will penalize that portion of the traffic which does not predominantly use rail yards. Such traffic consists of goods which move by unit trains, i.e., coal and grain, as well as goods which move via multiple car shipments. Also, certain shipments such as auto parts are specifically routed to bypass yards.

The volumes related to the class of traffic not predominantly involved in rail yards is on the order of 20% of total tonnage. In 1978, coal movements via unit trains accounted for about 14.0*/ percentage points of this 20% estimate, and grain shipments are estimated to add another 4**/ points for a total of 18% not including other multiple car shipments. Since the origination points for these shipments are typically rural and usually isolated locations, the need to apply the proposed environmental standards is superfluous and inequitable when the costs are directly related to other traffic.

ii. Carriers which do not pay income taxes

In 1978, only twenty-five carriers paid Federal income tax, and in 1977, only twenty carriers paid Federal

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*/ Approximately 210 million tons of coal are estimated to have moved in unit trains in 1978 compared to 1-1/2 billion tons of total movement.

**/ Approximately 56 million tons of grain are estimated to have moved in unit trains in 1978.

income taxes. As a result, those carriers which pay taxes and can take advantage of the deductions and credits resulting from the construction and maintenance of noise abatement facilities will experience a lower effective cost than those carriers which pay no taxes. Generally, the carriers which pay taxes are the healthier carriers. Thus, the effective cost of the noise abatement standards will be heaviest on those railroads which can least afford to pay it.

5. Impact of EPA Standards on Industrial Financial Performance

The precarious financial condition of a significant portion of the industry has already been described. Industry-wide, railroads will not be able to meet projected future demands for capital investment. In addition, the railroads' ability to pass on their cost increases will fare no better in the future than it has in the past. In view of this dire perspective, it is important to assess the impact of the proposed EPA standards on the industry's already inadequate financial performance Unfortunately, the effect is far from the nominal impact EPA has predicted.

a. The EPA Failed to Consider the Full Cost to the Railroad Industry

The assumptions concerning the implementation of the abatement techniques which serve as the basis for the cost estimates in Tables 4-3 and 4-4 are erroneous. Those assumptions reflect a failure on the part of the EPA to carefully consider the total impact on the railroads of implementing those abatement techniques. As we have specifically indicated in the prior sections of this statement, EPA ignored or was unaware of the total consequences of implementing those techniques. In order to calculate the true economic and financial impact of its proposals would have, the EPA should have recognized these consequences.

While it is virtually impossible in the short time available to prepare the comments to quantify accurately the total costs and assess the economic and financial impact on the industry, it is possible to at least summarize the costs which EPA should have considered in its analysis. With respect to the construction of noise barriers at retarders, it is not appropriate to look only at material and construction costs on the assumption that barriers can be installed at all locations. If barriers are to be installed, costs of track relocation, service interruption, loss of yard capacity and so forth should be considered. Rather than the $41.6 million shown in Table 8, the EPA should have considered the industry-wide costs which, based on Southern Railway's estimate of $25 million for installing barriers at its yards, would easily exceed $270 million for the industry.

With respect to "switch engine treatment," the EPA should not only consider the cost of installing mufflers, cooling fan silencers and engine shielding on switch locomotives but must consider the full implications of this proposal and assess the economic impact of the preposterous alternatives it is forcing upon the railroads. The relevant cost is not the $145.6 million for retrofitting switch engines, but is something in excess of $580 million.

EPA does not even attempt to estimate the cost of complying with the car coupling standard because it failed to comprehend the consequences of requiring essentially absolute compliance with the 4 mph speed limit. The cost of compliance with this single proposed rule would greatly exceed the $4 billion which was estimated by EPA to be the cost of purchasing land surrounding railroads as a buffer zone.

Additionally, the EPA should recognize and include in its assessment the full cost of taking equipment out of service for retrofit. For example, the last revenue due to out of service time for refrigerator cars undergoing a rebuilding program would increase the estimated cost by an additional $4.3 million.

The total capital costs shown in Table 8 and the annualized cost appearing in Table 9 should be restated to include the more realistic costs which the railroads would be forced to absorb if the proposed standards were to become the final railroad noise standards. Unfortunately, all of those additional costs are not precisely known at this time and some, such as those for the car coupling standards, are so high that it would be ludicrous to even attempt to measure their impact on the industry. However, since there is a reasonable basis for identifying at least the minimum realistic costs for barrier installation and switch engine retrofit in addition to the other totals listed on Tables 8 and 9, it would be helpful to measure the financial impact of the proposed standards using the available data. The costs shown in Tables 7 and 8 have been partially restated in Tables 11 and 12 respectively to reflect at least the minimum costs for barrier installation, switch engine retrofit and mechanical refrigerator car rebuilding.

b. Financial Impact

In order to illustrate the industry financial impacts of the costs of compliance, a financial statement for a "Constructive Year" has been derived and is contained in Table 11. The industry's actual recent performance in calendar year 1978 for Class I carriers*/ has been chosen as the basis for the constructive year. To that base year, additions to operating expenses and fixed charges were derived using the absolutely minimum estimates of capital costs, amortization, carrying charges, and annual maintenance costs associated with all abatement techniques other than the car coupling standard. These estimates are taken from Tables 11 and 12, adjusted to include the realistic costs of installing barriers, retrofitting locomotives and refrigerator car rebuilding only. No adjustments in freight rates were reflected since inflation increases exceed competitive rate recoupment. In order to avoid penalizing the fixed charge expense with the interest costs experienced in the first year of a loan, a normalized year has been chosen. This will understate the impact in

*/ Beginning in 1978 the ICC reclassified the annual revenue required for Class I status. The result was to reduce the number of affected roads by 14. These roads account for 1.5% of total traffic.

TABLE 11

COMPARATIVE YARD NOISE ABATEMENT ESTIMATED

CAPITAL COSTS

(Expressed in millions of 1979 dollars)

ITEM	EPA	AAR
Releasable Retarders	40.0	132.2
Switch Engines	7.9	582.1
Retarder Barriers	14.0	271.8
Load Cell Enclosures	19.4	89.5
Mechanical Refrigerator Cars	2.6	118.1
Low Noise Brakeshoes	0.0	?
Yard Measurement	5.9	5.9
Totals	89.8	1199.6
Class I Carriers	--	1114.4

TABLE 12

COMPARATIVE YARD NOISE ABATEMENT ANNUALIZED COSTS

(Expressed in millions of 1979 dollars)

ITEM	EPA	AAR
Releasable Retarders	10.5	36.6
Switch Engines	3.6	44.3
Retarder Barriers	3.0	37.9
Load Cell Enclosures	4.0	20.1
Mechanical Refrigerator Cars	0.3	30.0
Low Noise Brakeshoes	13.9	13.9
Yard Measurement	5.9	20.8
Totals	41.2	303.6
Class I Carriers	--	282.0

the initial interest charges but be more representative of the typical effect throughout the program.*/

To make a fair representation of the effects of the existing EPA standards which require investments every year for an item with a five-year life, the capital and operating costs in the fifth year of the program have been chosen. The referenced program was initiated in 1975 when EPA promulgated a noise abatement standard uniformly affecting the railroad industry beginning in 1979; whereby all new locomotives would be fitted with silencers costing $7500 per unit. The effect of this standard when applied to an estimated minimal 1,978 annual locomotive installations would be to increase the industry's annual capital expenditures $14.8 million each and every year. Furthermore, these capital costs contribute to higher operating costs of $3.4 million in depreciation and interest annually.

The calculations shown in Table 13 indicate that the existing EPA rules will only have a very modest impact on the industry. However, this perception changes dramatically when the effects of the proposed rules are incorporated. While total operating expenses plus fixed charges only increase 1%, the net operating income declines 29%; the rate of return decreases 44% and fixed charge coverage worsens by 44%. When such impacts are considered in the context that the existing situation is already financially tenuous, they can neither

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*/ Specifically, the interest expense charged in the constructive year for the proposed rules is $65.0 million versus an actual of $104 million.

be ignored or permitted to prevail. The industry cannot afford to absorb the costs of the proposed EPA standards and maintain existing plant and services. This viewpoint is further strengthened when it is realized that only a nominal amount of the actual expected costs have been considered in these calculations. The program is likely to be required to achieve the 70 and 65 dB standards and the point source standards are fundamentally more rigorous, ergo expensive, than the current program, the effects of which are reflected in Table 13.

Table 13

PRO FORMA FINANCIAL PERFORMANCE

CLASS I RAILROADS

1978 CONSTRUCTIVE YEAR

($ billions)

	Actual	With Existing EPA Rules	With Existing and Proposed EPA Rules
Total Operating Revenues	$ 21.829	$ 21.829	$ 21.829
Total Operating Expenses	$ 21.124	$ 21.139	$ 21.331
Net Operating Revenue	$ .705	$ .690	$ .498
Fixed Charges	$ .808	$ .813	$ .902
Total Income Taxes	$ .286	$ .283 (1)	$ .244
NROI	$ .443	$ .433	$ .268
Net Investment (2)	$ 27.33	$ 27.39	$ 28.50
Rate of Return	1.62%	1.58%	.90%
Fixed Charge Coverage	1.77 (3)	1.74	1.35

(1) Tax adjustment based on estimated effective tax rate of 36% for those carriers which paid taxes in 1978 and zero for those which did not.

(2) The net investment base reflects the average net investment in road and equipment less construction project interest and debits in other elements of investment, plus working capital, as prescribed by the ICC.

(3) NROI, before tax, plus other income less miscellaneous deductions divided by fixed charges.

VII. Other Important Considerations

The short time period allowed for public comment did not give the railroads sufficient time to advert to all their objections to the proposed rulemaking. The AAR's comments by necessity address only the most critical considerations going to the EPA's failure to effect the rulemaking through proper application of the statutory criteria contained in Section 17 of the Act. The Wyle Research Report (Exhibit A) points to numerous other serious errors and deficiencies in the rulemaking which should be heeded. In addition, there are several other important points which the EPA should consider.

First, the time frames provided to implement the various noise abatement techniques are woefully inadequate, and even the Background Document indicates that much longer times will be required. It would be absurd to think that the techniques identified in Table 4.1 for flat yards and hump yards to meet 70 Ldn could actually be implemented within less than two and one half years. This is especially true since implementation of these techniques will either entail the development of toally new technology and/or substantial modification of railroad properties to comply with the standards.

If the railroads attempted to implement the techniques within such a short time period, serious disruptions to operations would result. The two most obvious examples are the proposed retrofit of locomotives in switching service and installation of retarder noise barriers. Since the number of locomotives which would be affected is substantially larger than the EPA has indicated and since these locomotives will have to be retrofitted by locomotive manufacturers (as current railroad locomotive servicing and repair facilities have neither the capability nor the capacity to perform this work), this equipment would have to be retrofitted over a more protracted period, at least five years, in order to avoid serious disruptions to service. Similarly, as is indicated in Exhibit E, installation of barriers is not the simple one-shot deal the EPA think it is. Retarders at over one-half of the hump yards have inadequate clearances for barrier installation, which would then also entail large-scale relocation of retarders, switches and classification tracks at those hump yards. In order to avoid severe disruption to hump operations, retarder barriers would necessarily have to be installed seriatim which increases the time span for complete barrier installation. Engineering and planning for a medium size hump yard would take six months alone. Performing the necessary work to install barriers around just one group retarder with inadequate clearance would take one month at a minimum. To install retarder barriers at a complex hump yard such as Southern Railway's Inman Yard would take four years at a minimum. System-wide implementation would be more on the order of six to seven years. Comments on the other various techniques support the fact that they also cannot be implemented within the time frames allotted.

Thus, the EPA committed a grave error when it assumed without any investigation that it had allowed sufficient time for the implementation of the standards to avoid disrupting effects on rail opoerations and purposely refrained from including costs for disruption of service or removal of equipment and facilities from service in developing the cost of compliance. These costs, like all other unavoidable costs and considerations (including whether the railroads will be able to absorb these costs within the time frame), must also be considered.

Four, the EPA says that since it is unable to identify clearly the noise levels generated by maintenance-of-way equipment and thus cannot determine the availability of technology or the costs of compliance, it does not intend to set specific aggregate noise or point source limits for such equipment. This action raises the possibility that State and local authorities would now be in a position to set such standards. To avoid this and to ensure that the EPA adopts standards for <u>all</u> railroad equipment and facilities the EPA should make a specific finding that because technology has not been identified, that railroad maintenance-of-way equipment need only comply with best maintenance practices. It would be incongruous to permit State and local authorities to attempt to formulate regulations when the EPA cannot.

Fifth, with respect to the EPA's proposed definition of "through trains" contained in Section 201.1(55), this definition does not take into account the fact that "scheduled" trains, which do make stops at yards for such reasons as crew change, locomotive and caboose changeouts, service needs (e.g., fueling, sanding, and watering) and railcar set-outs and pick-ups, are also considered to be through trains by the railroad industry. Hardly any train "drives through" a yard without stopoping for one of the above reasons. Therefore, for purposes of the EPA's regulations and eventual enforcement measurement lists, the EPA's definition should be revised to take the foregoing into account.

VIII. Environmental, Energy and Safety Considerations

The EPA has given appallingly little attention to the environmental considerations of the proposed rulemaking in its Draft Environmental Impact Statement. The statement is legally insufficient within the meaning of Section 102(c) of the National Environmental Policy Act, 42 U.S.C. 4321 *et seq*. The statement's very brevity testifies to the EPA's failure to conduct a thorough analysis of the effects upon the environment of the proposed railroad noise standards and, in particular, from the standpoint of implementation of the various noise abatement techniques which the EPA has recommended to meet the 70 L_{dn} and 65 L_{dn} proposed receiving property standards. Such an assessment would have revealed that certain of the measures contemplated by the EPA, *e.g.* changes in operation to accommodate the standards, are clearly not viable alternatives because of the potentially devastating impacts. These impacts are discussed at length elsewhere in our comments. The draft statement is nothing more than a poorly veiled attempt to give a superficial analysis to the issues at hand. Set forth below are a number of considerations which the EPA should have addressed.

Alternatives

The EPA did not even discuss the impacts associated with the various noise abatement techniques recommended by the EPA to meet the proposed receiving property line standards. These impacts will include environmental, economic, safety, and health impacts. This oversight is especially critical with respect to the use of changes in operation as a noise abatement "technique", assuming that the term "best available technology" can be legally interpreted in that manner. The most notable impact would be shutdown of operations with all the corollary impacts on the shipping public and the public in general. Equally important is the EPA's failure to recognize that implementation of many of the techniques will result in large scale modifications of railroad properties at the expense of relocation of persons from their homes as well as in undue disruptions to service, especially given the short time frame allowed to implement the standards.

Land Use

EPA expects that reduction of railroad yard noise levels will create an environment suitable for residential development. This assumption goes against the basic concepts of land use planning. Railroad yards are industrial faciliies. Planning guidelines say that residential development should be buffered from industrial land use by commercial development. The very nature of the "railroad noise problem" (to the extent it may exist) results from residential development which occurred after the railroad was established but before land use planning became a generally accepted tool. See Exhibit U. Such guidelines should not be ignored.

Also, as pointed out in our comments elsewhere, application of the noise abatement technology suggested by EPA will not result in a reduction in receiving property noise at a reasonable cost. The alternative of purchasing land as a buffer zone to comply with the proposed standards, an alternative which even the EPA agrees is absurd in view of the large costs involved, engenders its own problems. Obviously such properties represent existing or potentially beneficial land uses, and the loss of these uses would certainly represent a significant adverse impact which should be considered.

Water-Quality

As discussed in the section of our comments discussing retarder lubrication, the potential for adverse water quality impact is increased due to the oil and water (and ethelyne glycol in winter) spray washing off of freight cars. To the extent this retarder lubrication technique provides beneficial noise attenuation, the adverse water quality impacts more than offset them, calling into question the wisdom of using retarder lubrication as a noise abatement technique.

The oily residue on the retarder mechanism is a slippery substance which creates a hazardous working environment. When combined with water, oil, and biodegradable materials falling from freight cars passing through the retarder, ethelyne glycol adds significantly to the degradation of these materials resulting in odiforous and unsanitary conditions around the retarder.

Economic Impact

As indicated elsewhere in the comments, the EPA has grossly understated the costs which would be incurred to implement the various noise abatement techniques to meet the proposed standards. These costs show that the the proposed rulemaking is a "significant" regulation and that the EPA should have prepared a Regulatory Analysis as required by E.O). 12044.

Air Quality

EPA fails to consider the impact on air quality as a result of diversion of rail traffic to less fuel efficient transportation modes. While the effects cannot be quantified, it can be stated with assurance that freight and traffic would be lost to trucks as a result of curtailed rail service [either by disruptions to operation to implement the standards (removal of equipment from service or track downtime or to install the noise abatement measures) or outright changes in operation to accommodate the standards] and higher rail transportation costs. Diversion of traffic to the trucking mode will adversely affect the air quality due to increased gaseous and particulate emissions from trucks,* thus adding to the already high levels of air pollution around the nation's highways.

Energy

Losses in railroad freight traffic to trucks will also affect the energy needs of this country. It is well known that railroads are vastly more fuel efficient than road haul trucks. In fact railroads are four times more energy efficient than trucks.** Again, while no quantitative estimates can be made regarding changes in fuel usage,

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* A Study of the Environmental Impact of Projected Increases in Intercity Freight Traffic, Researched by the Battelle Laboratories for the AAR.

** Energy Intensiveness of Passenger and Freight Transportation Modes 1950-1970; Oak Ridge National Laboratory in 1973, by Eric Hirst.

it cannot be questioned that diverting freight traffic to trucks and other forms of transportation will have a definite adverse impact on the worsening energy picture. We hasten to point out that the EPA substantially underestimates the fuel consumption needs of the rail industry. Page 7-43 of the Background Document indicates that the industry uses only about 4,000,000 gallons per year (1976). In 1978 the industry used roughly 4 billion gallons.

Noise

Another adverse impact of the possible diversion of rail traffic to trucks is that highway noise would most certainly increase. In a study by Wyle Laboratories (Exhibit V) it is shown that the noise exposure associated with moving a given tonnage of freight by truck is approximately 5 dB higher than by train. Although a calculation of the ultimate effect on people exposed has not been carried out, it appears that transferring cargo from trains to trucks is likely to significantly increase population exposure. Thus, analysis of any railroad noise control measure that has the effect of reducing the volume of freight hauled must include an examination of the increased exposure from other modes to which it is diverted.

Safety

Nowhere in the EPA proposal Background Document, Notice, of Draft Environmental Impact Statement is there any disucssion of the impact on railroad employee safety as a result of implementation of the noise standards. We would like to point out that there are serious concerns raised by railroad safety officers relating to application of the noise abatement technology in classification yards that should not be overlooked.

Barriers are of particular concern in terms of line of sight obstruction. The size of barriers proposed for use in hump yards on retarders and sharp curves are such that they block the vision of employees working near the barriers. Freight cars rolling through a yard normally do not create noticeable noise, and the railyard employee is obliged to be visually aware at all times lest he be struck by a moving car. The potential for an accident with barriers in place is increased significantly expecially during times of rain, fog, snow and at night.

Another concern is that barriers will cause problems with regard to clearance for maintenance personnel. In situations where barriers would be installed around retarders, this problem would be further aggrevated by the retarder mechanism action. Although employees working in the retarder area are normally protected by closing the track to traffic, adjustments to the mechanism are often made under operating conditions. Since barriers are most effective as close to the source as possible, essentially no room is left for needed clearance.

Also, enclosing load cells requires a very high degree of employee hearing protection, since the locomotive noise would be contained within the building and railroad workers involved in the load testing would be exposed to a far greater concentration of acoustic energy than if the locomotive were tested in an unclosed area.

Finally, use of a retarder lubrication system poses serious problems to retarder maintenance workers. The lubricating liquid is made up of water and oil in the warm months and ethelyne glycol is added during periods of below freezing weather.

IX. CONCLUSION

In conclusion, the AAR respectfully urges the EPA to give full consideration to the railroads' comments and to revise its proposals accordingly. The proposals as now constituted reflect a gross misinterpretation of the statutory criteria of Section 17, resulting in unreasonably low receiving property standards and point source standards which cannot be met. The railroads never believed that preemption could be gained without the quid pro quo of regulation with meaningful benefits. However, it does expect and insist that those regulations be formulated in accordance with the law. To impose standards which are not technological feasible, practical or cost-effective would unduly interfere with essential operations of the railroads as common carriers, would impose a substantial burden on the shipping public, and would do an extreme disservice to the public welfare in general.

Submitted by:

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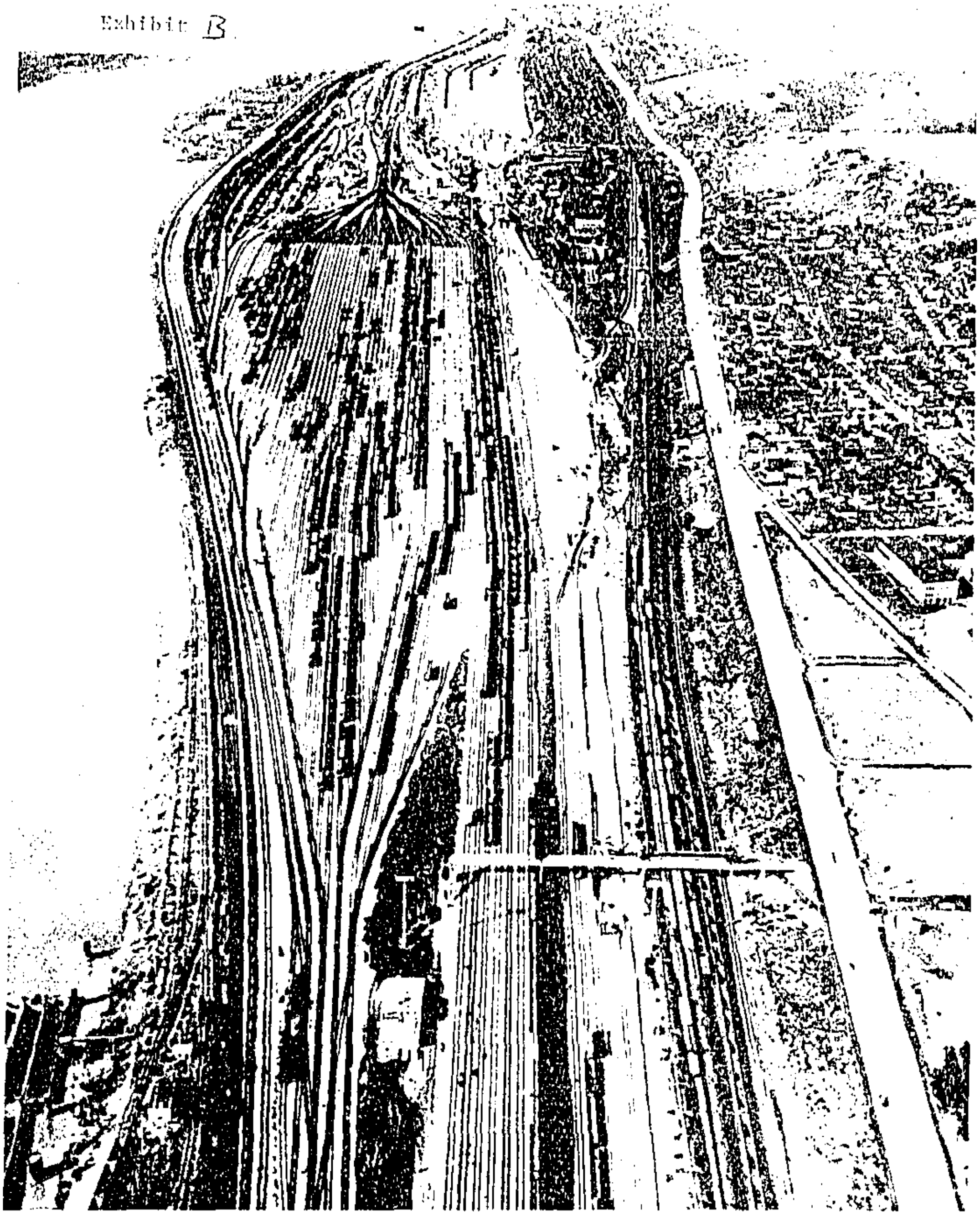
Dated: July 2, 1979

Exhibit B



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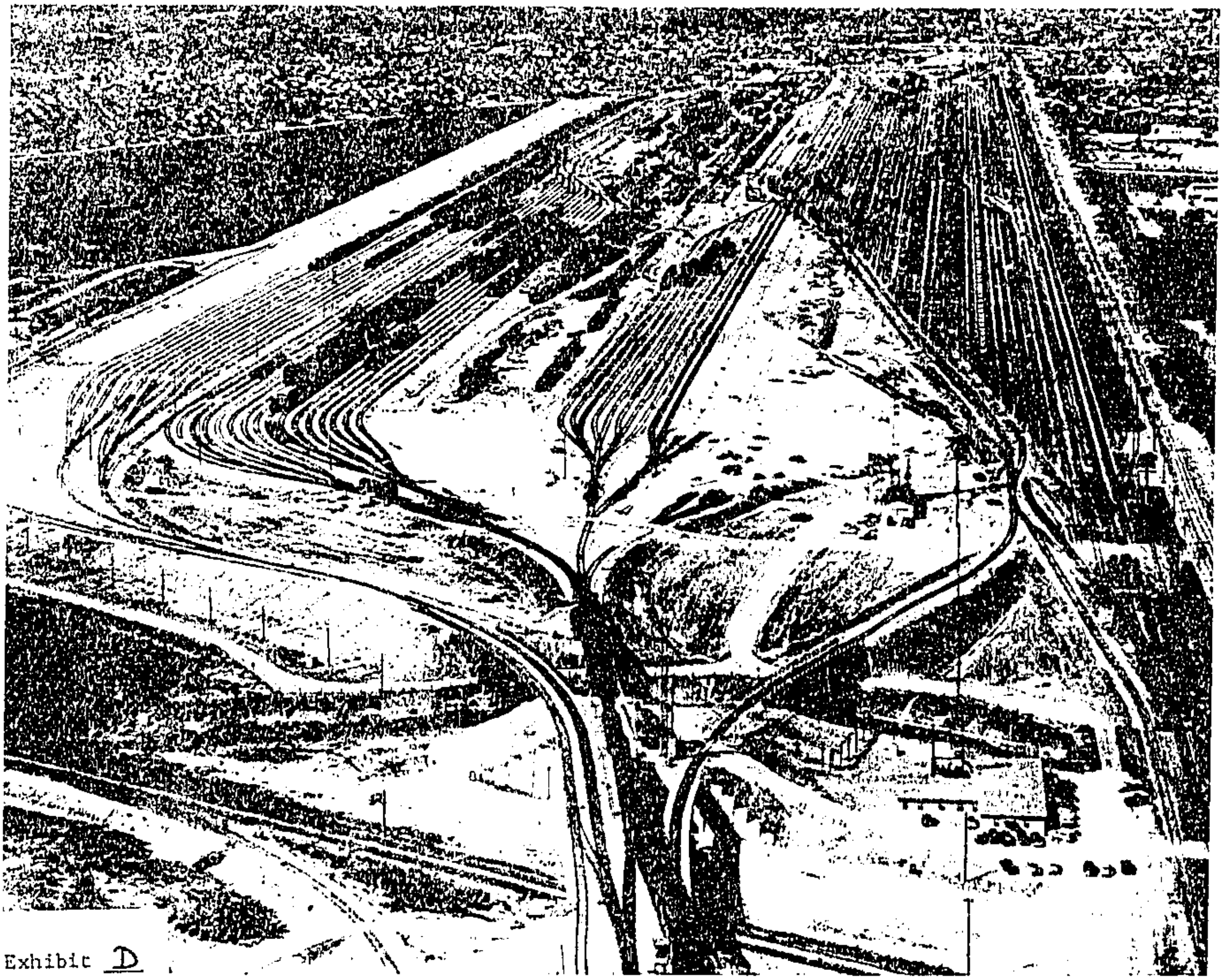

Exhibit D

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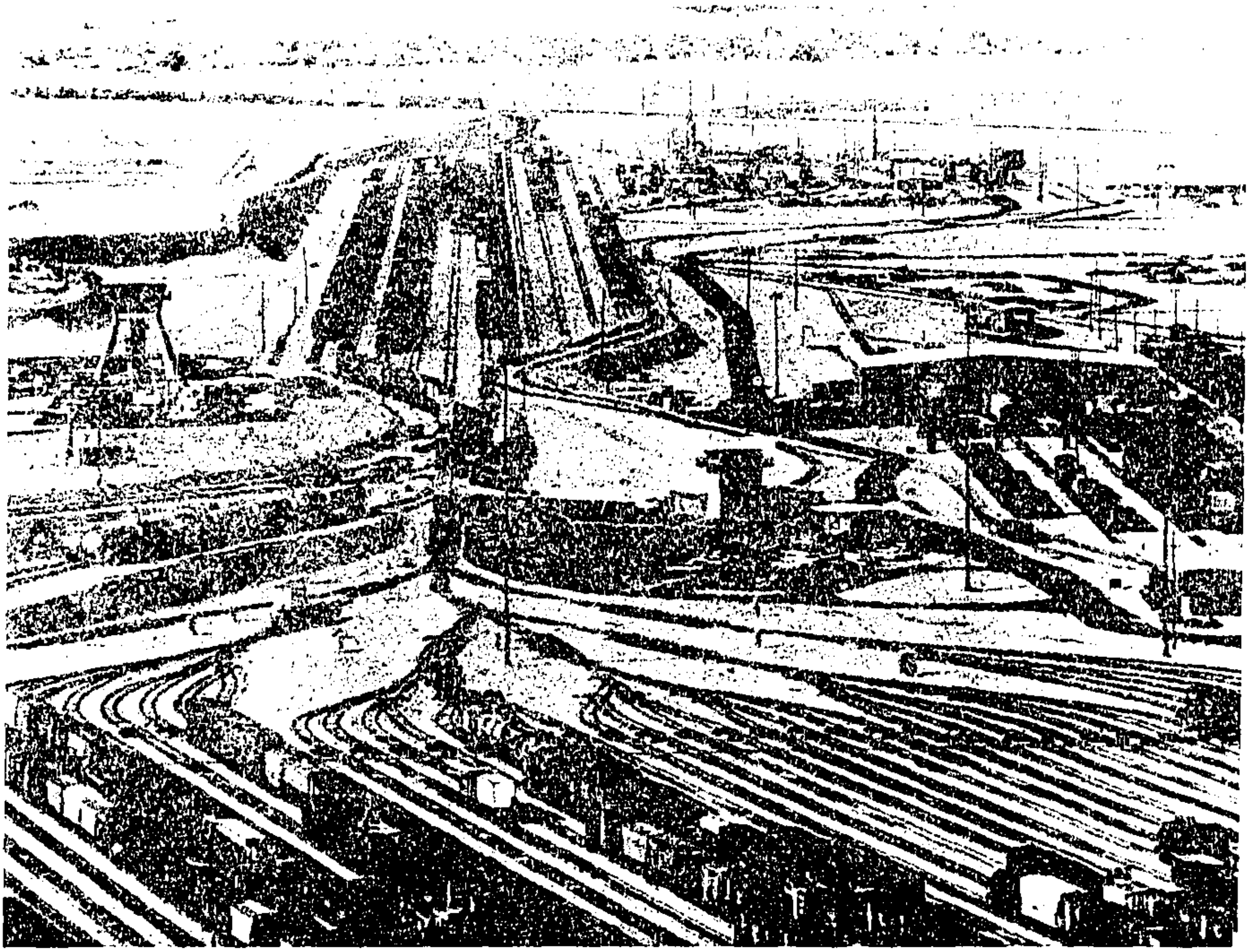
Exhibit F



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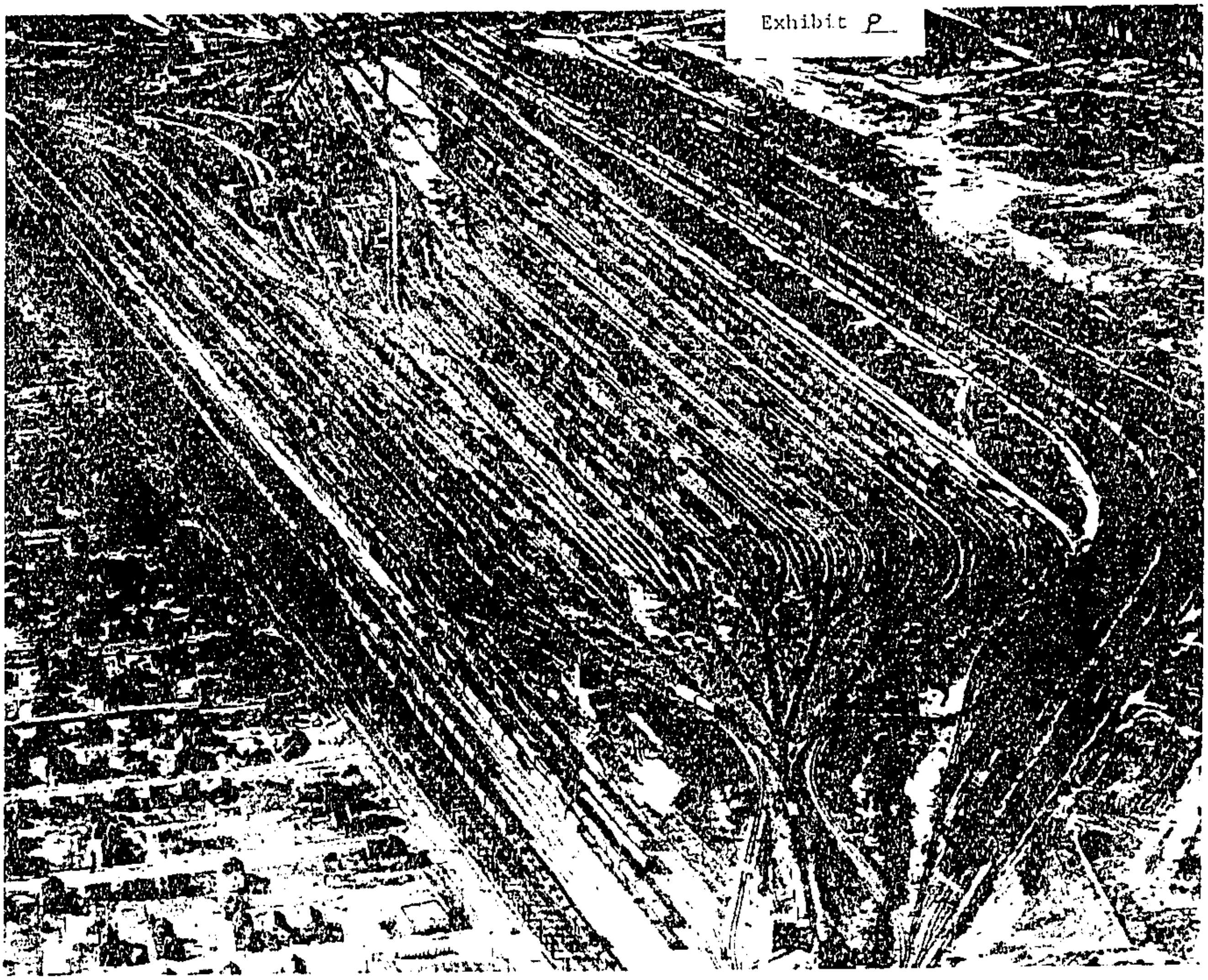

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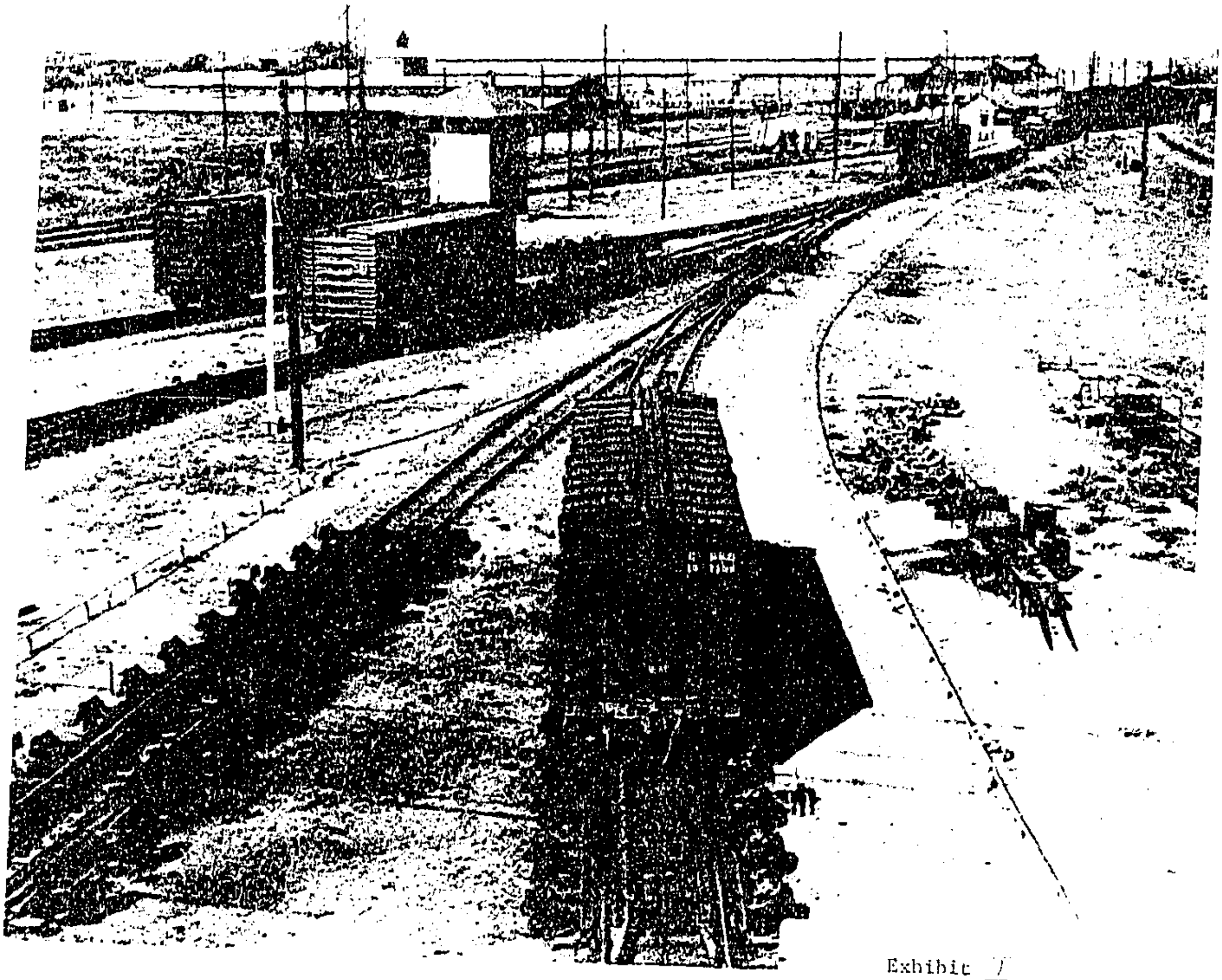

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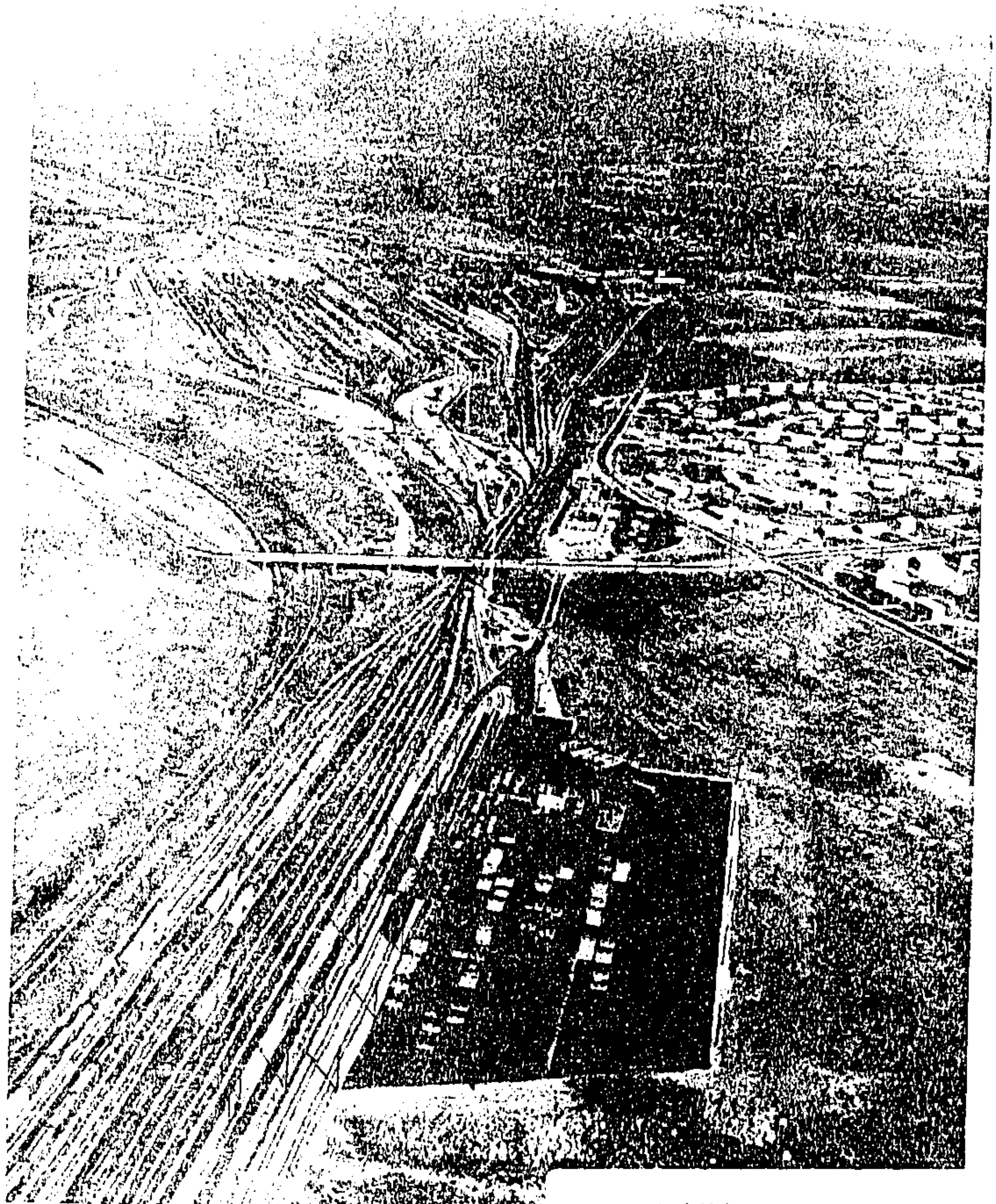

Exhibit

WYLE LABORATORIES

EXHIBIT A

WYLE RESEARCH REPORT

WR 79-10

A REVIEW OF THE RAILROAD YARD NOISE STANDARDS AS PROPOSED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY ON APRIL 17, 1979

REPORT

For

THE ASSOCIATION OF AMERICAN RAILROADS
Research and Test Department
Washington, D.C. 20036

By

Wyle Research Staff
WYLE RESEARCH
Arlington, Virginia 22202

May 1979

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd)

LIST OF TABLES

LIST OF TABLES (Cont'd)

1.0 INTRODUCTION AND SUMMARY OF RESULTS

1.1 Introduction

This report presents a critical review of both the Noise Emission Standards for Transportation Equipment; Interstate Rail Carriers, presented by the U.S. Environmental Protection Agency in their Notice of Proposed Rulemaking published in the Federal Register on April 17, 1979, and the associated background document which was released by EPA at the same time. Both of these documents have been examined in order to assess the completeness of the acoustic analysis.

Before reviewing the specific topics that were studied and summarizing the major results, it is appropriate to discuss the motivation behind and direction of the analysis. In past discussions with EPA representatives regarding the proposed regulations, it has been freely admitted that there are many areas concerning both the suggested noise control of major railroad equipment and the community impact analysis for which little or no background information exists. The stated view of EPA has always been that, unless there is additional information available to fill these gaps, there is little need to point them out.

This is not our view. We believe that there is considerable value in pointing out weakness in the present analysis, even if they cannot be corrected at the present time. It is not possible in the very limited time period available for comment on these proposed regulations to develop information that will provide all necessary modifications to the EPA analysis, although we will supply whatever additional information has been developed. Rather, it is our purpose to identify major weakness so that a judgment can be made as to the sufficiency of the present analysis.

The critical review contained in this report addresses four general areas that are discussed in the proposed regulation or in its background document. Chapter 2 reviews the discussion of Baseline Noise Emission that appears in Section 4 of the background document. Chapter 3 reviews the analysis of current Noise Control Technology that appears in Section 5 of the background document. Chapter 4 reviews the various parts of the Health and Welfare Impact Model that appears in Section 6 of the background document. Chapter 5 reviews the Proposed Measurement Methodology that is detailed in both the proposed regulation and in Appendix A of the background document. Finally,

Appendix A of this report presents the detailed results of an analysis of the contribution of various types of sources to the total noise at selected points on the boundaries of several railroad yards, based on the current field measurement data base. The remainder of Chapter 1 of this report contains a brief summary of the principle results that are obtained in this study.

1.2 Summary of the Review of the Baseline Noise Emission Analysis

In Section 2 of this report the Baseline Noise Emission Study described in Section 4 of EPA's background document is examined. Two general areas are considered: the average noise levels due to existing railroad yard noise sources, and an analysis of the hourly L_{eq} contributions at the boundary of railroad yards due to each type of noise source.

In most cases, there is good agreement between our computations of the energy-average level at 100 feet for each type of source and the values listed in Table 4-1 on page 4-5 of the background document. However, in the case of mechanical refrigerator cars, our estimate of this average level is 9 dB higher than that of Table 4-1, and in the case of idling locomotives, our estimate is closer to that listed for stationary switch engines, which is 15 dB higher than for idling locomotives. Indeed, since the distinction between "switch engines" and other types of locomotives which may be used for switching purposes is vague, it is not at all clear that two class types should be used to describe these sources.

Thus it appears that the source levels for mechanical refrigerator cars and for idling locomotives are considerably underestimated in the background document. These underestimates are then carried over into the noise model developed in Section 6 of the background document, so that the L_{dn} contribution due to each of these sources is also underestimated. This result, in turn, is carried into the impact model so that the resultant ENI near sections of the yards where such sources are presumed to be dominant are also underestimated. In addition, the suggested treatments required to attain the regulatory levels for various types of yards may not be sufficient because of the actual higher noise contribution from these two underestimated sources.

The second analysis of the baseline noise measurements consists of estimates of contributions of noise from various types of railroad and non-railroad sources to the measured boundary line hourly L_{eq} at selected sites. This analysis was performed by examining annotated strip charts of the temporal variation in A-weighted sound level to identify peak levels and durations of each noise event occurring during specific time periods. These peak levels and durations were then entered into phenomenological models from which the fraction of acoustic energy emitted by each source type was computed.

Upon examining the results of this analysis, several general observations became apparent. First, it is difficult to determine accurately the contribution of a given type of noise source using relatively simple mathematical models that relate peak sound level and duration to the SEL for a given event. Since any noise control implementation will have to be preceded by a study to determine accurately the major contributors to boundary line L_{eq} levels at a given yard, methods superior to annotated strip charts will have to be developed to measure source contributions.

It also became clear, from several of the sites that were studied, that a single event or a very few events could control the resultant L_{eq} for the hour in which they occurred. Thus, it is unlikely that an observer would be able to estimate accurately the major noise source, on an L_{eq} basis, without examining some sort of temporal history of the sound level.

Finally, it also became clear that it is quite possible for the dominant source to change in a short time. For example, an analysis was performed for two successive hourly periods at the same measurement site at the Brosnan Yard in Macon, Georgia. During the first hour, railroad noise sources accounted for approximately 93 percent of the acoustic energy received at the site; during the second hour, non-railroad sources accounted for approximately 98 percent of the acoustic energy. Such large changes from hour to hour make it extremely difficult to assess, in any reliable fashion, whether or not the railroad is the dominant noise source at a given site.

1.3 Summary of the Review of the Noise Control Technology Analysis

The review of the Noise Control Technology Analysis in Section 5 of the Background document centers on three major items: control of locomotive noise, control of retarder noise by use of barriers, and control of mechanical railroad refrigeration car noise. In each of these areas, serious deficiencies have been identified.

In examining referenced sources on locomotive noise control, it has become clear that most existing diagnostic studies have shown useful noise reduction due to the addition of mufflers only for the case in which the locomotive is at its high throttle setting. At such throttle settings, reductions in sound level of 3 to 5 dB with the use of exhaust mufflers have been demonstrated for a few locomotives. At low throttle settings and at idle, the conditions most likely to be found in railroad yards, reductions due to exhaust mufflers have been 1.5 dB or less. Thus, the 3 to 4 dB reduction listed in Table 5-1 on page 5-11 of the background document for switch engines in throttle positions 0, 1, and 2 is an over-estimate.

Similarly, the referenced sources have shown that fan noise and engine casing noise are not dominant sources at idle. Thus, neither fan treatment nor partial-engine shielding would provide much reduction to the noise emission at idle. Since the source contribution analysis in Chapter 2 of this review has shown that idling locomotives can be a significant contributor to the sound level at certain locations on the boundary of a yard, it would appear that nothing within the present state of the art will provide much noise relief at such locations. Certainly, EPA's recommended abatement procedure — switch engine treatment — will have little or no effect in such cases.

In examining the referenced documents on the effectiveness of barriers in reducing squeal noise from retarders, several problems have been identified. The 16 to 22 dB insertion loss quoted in Table 5-1 of the background document is obtained only at positions perpendicular to the barrier (as is stated in a footnote to the table). At other angular positions, the insertion loss is less so that, if a spatial average is performed over angle, a value of 10 dB results. Thus, it is quite likely that the effectiveness of such barriers in reducing the squeal noise at the boundary line will be much less than one might expect from the figures in Table 5-1. This is especially true when one considers that the group retarders are generally oriented so that the axis of the one closest to the boundary line points into the community. Since the source contribution analysis in Section 2 of this report has shown that, in some cases, retarder noise can be the dominant source at the boundary line of a yard, this fact has serious implications as to the ability to achieve the L_{dn} values required by the regulations at the boundaries of hump yards.

A second concern regarding the use of barriers to control squeal noise concerns the published values for the peak sound levels measured at positions 100 feet from the retarder after the barrier had been put in position. In no cases studied did the average sound level for a series of squeals fall below 90 dB, the regulatory limit set for this position in the proposed rulemaking. Thus, it has not been demonstrated that such levels are attainable with available technology.

Finally, in examining the referenced documents on mechanical refrigerator car noise, along with additional documents describing railroad refrigeration units and recent measurements made on the noise levels from such units, two problems have become clear. First, the average sound level at 100 feet due to mechanical railroad refrigerator car refrigeration units is about 6 dB higher than that reported for truck-mounted refrigeration units, when both types of units are operating at their maximum speed. Second, different types of diesel engines are used to power each of these two types of refrigeration units. While railroad refrigeration units are universally driven by two-stroke diesel engines with blower attached, truck-mounted refrigeration units are driven by four-stroke diesel engines without blowers.

Thus, it cannot be assumed a-priori, as has been done in the background document, that the noise control techniques (i.e., muffler) developed for truck-mounted refrigeration units will produce the same amount of noise reduction when applied to railroad type refrigeration units. In order to properly assess the noise control requirements for railroad refrigeration units and the associated cost, it would be necessary to do a diagnostic study of the specific sources of noise on such a unit. To our knowledge, no such study has been done.

When the lack of demonstrated noise control technology for this noise source is coupled with the fact that an average noise reduction of approximately 7 dB will be required to meet the proposal standard, it becomes apparent that insufficient work has been done in establishing the practicality of this portion of the proposed regulation and that available technology has not been demonstrated.

1.4 Summary of the Review of the Health and Welfare Impact Analysis

In reviewing the statistical models that were used to determine the noise exposure and resultant impact around "average" yards of each type, and hence, compute the total national impact of noise emission from railroad yards, several points cause some concern.

Generally, any attempt to build such a model is plagued with a lack of accurate input data. The input data in this case, includes source strength levels, numbers of each type of sources, and position of each of the sources relative to the boundary line — again, all in terms of some sort of national average. Much of the data required is not available, at least not to any degree of accuracy.

An impressive effort has been made in the background document to gather the required information, expecially in the EPIC studies of remote imagery to establish typical source-to-boundary distances. However, even given the effort expended in this task, there is still considerable uncertainty in the average values obtained for these distances. If the total population of railroad yards had been included in obtaining these average distances, then they would indeed represent true averages of the population. However, since of necessity only a small sample was employed in the analysis, the averages represent only an estimate of the population average. There is therefore, unavoidable and inherent uncertainty associated with this estimate. Because of this uncertainty, and because of the dependence of the sound levels on distance, there is a corresponding uncertainty in the estimated L_{dn} contours and in the resultant impact estimates.

Similarly, there are additional uncertainties associated with the fact that the average sound levels attributed to each source are only estimates of the true average based on a sample of the total population. Again, this produces an uncertainty in the average level for the source, which propagates into an additional uncertainty for the resultant impact. Similar statements could be made about the estimates of the average numbers of sources of each type present in each type of railroad yard.

The point is not that these uncertainties should be removed; there is no way to do that, since estimates would always have to be made on the basis of samples of total populations. Rather the point to be made is that the background document should contain an explicit statement of the uncertainty in the estimated impact. This uncertainty could be determined by estimating the uncertainty of each of the averages that are input into the model and then propagating these estimates through the model equations to determine the overall statistical uncertainty of the result. The individual uncertainties of the averages that are input into the model can easily be computed from the standard deviations of the sample measurement in each case.

Such a procedure would indicate the accuracy of the estimated impact and this would, in turn, indicate whether or not improvements need be made in the sample sizes used to compute the average values of the input variables. Clearly, if the differences between the ENI's calculated for the various study levels are on the order of or smaller than the uncertainties associated with these ENI's, then the sample sizes are too small and no reliable conclusions can be drawn as to the effects of the study options. Although this has not shown to be the case here, it should be investigated so that there could be confidence in the predictions of the impact model.

A second area of concern includes the procedure by which the effective number of people impacted (ENI) for each yard type was computed. For hump yards and for flat yards, the noise sources were arranged into four source groups. The total L_{dn} for each source group was computed at points within the surrounding community and the resultant ENI due to each source group was determined. The total ENI was then assumed to be the sum of various combinations of the individual ENI's from each source group depending on the location of each element of population relative to the yard. This procedure is technically incorrect; the levels at a given point from each of the four source groups should have been energy-added first, and a single ENI calculated from the resultant total level. All such ENI's throughout the study area should then have been summed to produce the total ENI. This error has the potential of seriously overestimating the impact of the railroad noise.

In previous discussion with EPA on this point, they have maintained that the error involved is minimal due to the large distances between source groups. They point out that, at any location in the community, the total noise is mostly from the nearest source group. The noise contribution from more distant source groups is small and thus, the ENI due to each of these more distant groups is also small. In EPA's view, the result is that any errors involved in adding ENI's rather than energy-adding levels, is also small. It is not at all clear that this is indeed the case; to clarify this point, any errors due to the method employed in the analysis should be mentioned and quantified in the background document.

Another assumption that would tend to overestimate the impact of the railroad noise is that the population density throughout the study area surrounding the yard is assumed to be constant. This may be true around small yards in suburban areas, but larger yards in urban areas are generally surrounded by major highways and by industrial or commercial structures. It seems quite likely that a more accurate density model would be one in which the population density decreases as one approaches the yard boundary. In fact, in viewing the road structure and the house densities on the two USGS maps provided as examples of the EPIC analysis in Appendix R of the background document, this does indeed seem to be the case.

Since a model in which the population density decreases as one approaches the yard would result in fewer people in areas where the yard noise is high, the resultant noise impact could be much lower. Since such a reduction in ENI would have a corresponding reduction in the benefit cost ratios used in assessing the various study levels, it seems appropriate that such a refinement to the model should have been considered.

Finally, the point should be emphasized that the impact model considers only railroad noise sources. Although this is technically the correct way of analyzing the railroad impact, it also can be misleading when reductions in ENI are discussed as in the background document. That is, since no other sources are considered in determining the ENI, the reductions predicted for various regulatory options may not in fact be achieved. Once the contribution of the railroad sources to the sound level at a given point has been brought to about 3 dB below the total sound level due to all sources at that point, additional reductions in the railroad component will have little effect on either the total noise level or the resultant ENI.

Thus, it is misleading to state, without qualification, that a given reduction in railroad noise will produce a given reduction in ENI. An accurate estimate of the true reductions in ENI that would be obtained with a given reduction in the railroad noise component would have to include consideration of the noise level contributions from all other sources.

1.5 Summary of The Review of the Proposed Measurement Methodology

Possibly the most serious areas of concern in this report arise in the review of the measurement methodology that is outlined both in the Notice of Proposed Rulemaking and in Appendix A of the background document. The problems involved here cast considerable doubt on the workability of the entire procedure. Four general areas have been identified as containing serious weaknesses.

First, in describing the methodology to be used in measuring the sound levels from retarders, mechanical refrigerator cars, and car impacts, the effects of a wide variety of factors such as instrument accuracy tolerances, reflecting objects near the source, competing noise sources, ground surface and contours, and wind conditions — all of which are known to have important influences on the accuracy of sound level measurements — are not fully examined. Since most of these factors cannot generally be controlled in a railroad yard, a considerable margin of tolerance must be permitted above the proposed regulatory levels to allow for increased noise levels due to these effects.

Second, there is concern regarding the instrumentation specifications for the integrating sound level meters to be used in measuring the L_{eq} and L_{dn} at points exterior to the yard. At present, no national or international standards on integrating sound level meters exist for such equipment. While some integrating sound level meters are commercially available, specifying a requirement for such instrumentation in a federal regulation, prior to the availability of accepted national standards, is considered undesirable. The specifications given in the NPRM are considered inadequate to properly define, in lieu of a standard, the operating characteristics of such equipment.

Third, by allowing L_{eq} and L_{dn} measurements to be made at a distance of 2 meters from a residential dwelling surface, a point at which reflections from the surface could contribute up to one-half of the total A-weighted acoustic energy, the proposed regulatory level could effectively be reduced by about 3 dB. Thus, if a measurement is made at such a position, the effective (free field) regulatory levels of L_{dn} 70 and the L_{dn} 65 would become L_{dn} 67 and L_{dn} 62, respectively. If this is indeed the intent of the NPRM, it should clearly be stated as such, rather than being hidden as an artifact of the measurement procedure.

Finally, the procedure for determining "clear dominance" and "dominance" of the railroad yard noise component has been carefully studied and shown to be inadequate in its present form. The tolerances that would have to be allowed to take into account the uncertainties in all the model calculations involved are so great as to make the procedure essentially unworkable.

2.0 BASELINE NOISE EMISSIONS

In the review of the baseline noise emission study in the background document, two general points were noted. First, no attempt was made by the EPA to quantify the statistical accuracy of the energy-averaged sound levels for each railroad source which are listed in Table 4-1 on page 4-5 of that document. Second, no attempt was made by the EPA to determine the specific noise sources that were dominant contributors to the measured hourly equivalent sound levels at sites where measurements were conducted by EPA, although the required information was available in the field measurement data base in the form of annotated strip chart recordings.

In an effort to address these questions, an independent review was made of available literature on railroad noise source levels and a table of average sound levels plus associated confidence limits for each general type of source was compiled. In addition, selected portions of the available annotated strip charts were examined to estimate the dominant noise sources for the corresponding time periods.

2.1 Average Noise Levels for Selected Railroad Noise Sources

An examination of currently available literature (Reference 1-15) containing specific measured values of A-weighted sound levels of railroad equipment was conducted. All levels were tabulated by equipment type and corrected, assuming geometrical spreading, to a distance of 100 feet from the source. Tables giving frequency of occurrence versus A-weighted sound level at 100 feet, the latter in 5 dB steps, were then prepared for each source type. From the frequency histograms of these samples, estimates of the ensemble energy-average levels of the source population and their corresponding 90 percent confidence intervals were computed.

The results of this analysis are shown in Table 2-1. In general, the average levels agree quite well with those listed in Table 4-1 on page 4-5 of the background document, especially when the confidence interval is taken into account. However, the levels are considerably different for idling locomotives and mechanical refrigerator cars.

The reasons for the difference in the case of idling locomotives is unclear. It may be due to the fact that the background document attempts to distinguish between switch engines and other types of locomotives, while our analysis did not make such a distinction

Table 2-1

Estimate of Ensemble Energy-Average Sound Level at 100 ft. and Corresponding Confidence Limits for Selected Railroad Noise Sources

Source	Sample Size	Energy-Average Sound Level at 100 ft., dB(A)	90% Confidence Limits, dB(A)
Retarder	750	110.1	107.9 – 111.5
Car Impacts	94	96.3	89.2 – 98.8
Idling Locomotives	39	78.2	- – 94.9
Moving Locomotives	36	84.1	82.2 – 85.4
Moving Trains	33	86.4	82.5 – 88.6
Mechanical Refrigerator Cars			
High Speed	50	71.9	71.2 – 72.5
Low Speed	13	65.4	64.0 – 66.5

between locomotive types. It should be noted that our figure is close to the average claimed for stationary switch engines in the background document. The published literature does not indicate that there is a difference between the sound levels for stationary switch engines and for idling locomotives.

The reasons for the differences in the average levels for mechanical railroad refrigerator cars become clear when the sources of the samples used in the calculation in the background document were examined. As is described in more detail in Section 3 of this report, of the 27 measurements used in EPA's calculation (the number 60 in the background document is a misprint) only 5 are measurements on mechanical railroad refrigerator cars. In addition, those five values represent measurements on only two such cars, with each car operating at a variety of conditions. In our calculation, we included only measurements on the diesel engine side of actual mechanical railroad refrigerator cars and we segregated the data into two groups, depending on engine speed.

2.2 Contributions of Various Noise Sources to Hourly L_{eq} Measurements at Railroad Yard Boundary Measurement Sites

In order to obtain realistic estimates of the type of noise sources that dominate the hourly L_{eq} at the boundary of railroad yards, we examined the annotated strip charts of the temporal variation in A-weighted sound levels that were gathered as part of the field measurement program of the background analysis. Also included were strip charts that were obtained at two additional yards after the release of the background document.

For each yard for which annotated strip charts were available, the hourly L_{eq} values were examined. The section of the chart for the hour with the maximum L_{eq} value was examined to see if the annotation was sufficiently complete for further analysis. If it was not, other hourly segments were examined, in order of decreasing hourly L_{eq} until an acceptably documented segment was found, whereupon tables were compiled listing maximum levels and durations for each type of noise event in the time interval.

To determine the hourly L_{eq} value corresponding to each type of noise source, it was necessary to estimate the sound exposure level (SEL) for each noise event produced by that source type, and then sum, on an energy basis, all the individual SEL's to obtain the total SEL for the source type. To estimate the single event SEL's from maximum sound levels and durations, it was necessary to develop phenomonological models using measurements of actual tape recorded data. The procedure is described in Appendix A of this report.

Once the total SEL's were determined for each noise source type encountered in an hourly time period, the total SEL and the corresponding $L_{eq(1)}$ for that hour was computed along with the percentage of the acoustic energy that was received from each source type. The detailed results of all these calculations at each yard studied are given in Appendix A.

The major noise contributors for each measurement period are ranked in Table 2-2. Several points immediately become clear. First, there is no commonality of dominant noise sources even for yards of the same type. Note that at three hump yards retarder noise is a major contributor, while at two other hump yards, it is not. Second, the dominant source can change from hour to hour. At the Brosnan Yard, railroad noise sources are dominant one hour, while non-railroad noise sources are dominant the next hour. Finally, an examination of the individual event SEL's in Appendix A shows that one or two especially loud and/or long noise events can completely dominate the L_{eq} for the hour in which they occur.

An additional point should be mentioned here since it has important implications for eventual noise control around railroad yards. In designing the control techniques to be implemented for any specific yard, a noise control engineer would first attempt to accurately quantify the contributions to the boundary line L_{eq} of each noise source type in the yard. He would then be able to calculate the amount of noise reduction needed for each source type in order to reach the desired L_{eq} or L_{dn} goal.

It does not appear that the use of annotated strip charts, as implemented in this study, is sufficiently accurate to be used for this purpose; although it is probably good enough to obtain a relative ranking of noise source strengths. When the calculated $L_{eq(1)}$ values from the strip chart analysis are compared with the corresponding field measured $L_{eq(1)}$ values, as shown in Table 2-3, it becomes apparent that large differences are possible.

Table 2-2

Ranking of Principle Noise Contributions to Boundary Line $L_{eq(1)}$ Measurements at Selected Yards

Yard	Type	Site	Date	Time Period	Noise Sources: Retarder	Moving Loco.	Idling Loco.	Moving Trains	Other RR Sources	Non-RR Sources	Background
Barstow	Hump	33-1	2/18/78	0300-0400	1						
Barstow	Hump	33-3	2/17/78	2200-2300			1				
Brosnan	Hump	41-1	2/2/78	1200-1257		3	4	1	2		
Brosnan	Hump	41-1	2/2/78	1300-1400						1	
Cicero*	Hump	1	4/28/78	1540-1640						2	1
Cicero*	Hump	2	4/28/78	1235-1335				2		1	
Cicero*	Hump	2	4/27/78	1615-1715		2		1			3
Cicero*	Hump	2	4/27/78	2200-2300		2		1			
Cicero*	Hump	3	4/27/78	1415-1515				2	1		
Cicero*	Hump	4	4/28/78	1430-1530			1				
Pavonia	Hump	1	4/20/79	1119-1221	1						
Pavonia	Hump	3	4/20/79	1420-1523		1				2	
Roseville	Hump	31-1	2/3/78	0900-1000	1						
Barr*	Flat	1	4/30/78	1030-1130		1	3	2			
Barr*	Flat	2	4/30/78	1400-1500		1		2			3
Barr*	Flat	3	4/30/78	1520-1620		2		1			3
Barr*	Flat	3	5/1/78	0900-1000		1		2			
Barr*	Flat	3	4/27/78	1415-1515				2	1		
Barr*	Flat	4	4/28/78	1430-1530			1				
Dillard	Flat	51-1	2/3/78	1500-1555				1		2	
Johnston	Flat	52-1	2/16/78	1800-1900				2		1	
Johnston	Flat	52-2	2/16/78	1003-1100			1				
Mays	Flat	42-1	2/9/78	2200-2300					1	2	
Richmond	Flat	32-1	2/8/78	1600-1700		1		2			
Settegast	Flat	43-1	2/17/78	1100-1200						1	
Wilsmere	Small Ind. Flat	1	4/18/79	1051-1201						1	2

* "Rail Yard Noise Measurement Data", Appendix B of Background Document for Proposed Revision to Rail Carrier Noise Emission Regulations, U.S. Environmental Protection Agency, pages 358 and 388.

Table 2-3

Comparison of Calculated $L_{eq(1)}$ with Measured $L_{eq(1)}$ Values in dB.

Site No.*	Yard	Measured $L_{eq(1)}$	Calculated $L_{eq(1)}$	Δ, dB
31-1	Roseville	59.9	64.7	+ 4.8
32-1	Richmond	74.5	76.0	+ 1.5
33-1	Barstow	71.3	72.8	+ 1.5
33-3	Barstow	64.6	68.0	+ 3.4
41-1	Brosnan	60.7	60.2	- 0.5
41-1	Brosnan	64.7	75.0	+10.3
42-1	Mays	71.3	64.0	- 7.3
43-1	Settegast	66.9	74.2	+7.3
51-1	Dillard	71.4	75.6	+4.2
52-1	Johnston	86.6	83.6	- 3.0
52-2	Johnston	72.9	72.5	- 0.4
1	Pavonia**	75.8	80.8	- 5.0
3	Pavonia**	58.1	[illegible]9.9	- 1.8
1	Willsmere**	61	61	0

*EPA Test Sites
**Wyle Measured Yards

In many cases, the measured and calculated L_{eq}'s are in good agreement. However, the calculated $L_{eq(1)}$ values at Brosnan, Mays and Settegest Yards are quite different than the measured values. This may be due to the statistical uncertainties involved in the SEL model used in the calculations, to poor documentation of strip charts, or to malfunction of instrumentation. Annotation of the strip charts in the background document for many of the yards is poor. For example, one source at the Brosnan yard contributed most of the energy towards the hourly L_{eq}; yet, it is not identified on the EPA strip chart. Thus, one cannot determine that the source was the railroad activity (actually, the time history appears similar to that of an aircraft). To determine the railroad source contribution, it is very important that all the sources be labeled. Background noise was not labeled as such at most of the yards, nor were non-railroad sources routinely labeled. Proper documentation of all time periods is needed to accurately compute the noise contributions of each source. It would thus appear that, in order to be able to perform accurate and cost-effective noise control design, a technique other than that employed here must be developed to accurately quantify individual noise source contributions.

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6. Letter to Mr. H.S. Vierling (Chicago and Eastern Illinois Railroad), Bolt, Beranek and Newman, July 23, 1973.

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13. Noise Survey of the Illinois Central Gulf Railroad, Mays Yard, Environmental Engineering Department, February 8-10, 1978.

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15. Report of Chicago and Eastern Illinois Railroad Company, May 3, 1973.

3.0 NOISE CONTROL TECHNOLOGY

3.1 Locomotive and Switch Engines

As shown in Section 2 of this report, noise from idling and in-service locomotives and switch engines can have a controlling influence on L_{eq} and L_{dn} values. In light of this, an investigation was made of the technology currently available for reducing such noise at its source. A complete evaluation of locomotive noise control technology requires identification of individual noise sources on the locomotive, quantification of the relative noise emission of each source as a function of duty cycle, and determination of the available methods of controlling each source. Although there have been numerous reports of measurements of the total noise from locomotives, there has only been limited study of individual locomotive noise sources. The most commonly identified noise sources on a diesel locomotive are engine exhaust noise, radiator fan noise, and engine casing noise. To investigate noise emission levels from these sources, a review was made of pertinent technical reports. Documents referenced in this part of the report is listed at the end of the chapter.

Reference 1, which was a study performed for the U.S. Department of Transportation, includes the results of a noise diagnostic study of an EMD SD40-2 locomotive. The diagnostic test procedure involved silencing all sources on the locomotive to the extent possible and measuring far-field noise levels as each source was allowed to generate its normal noise emission. By comparing the far-field noise levels for each source in this fashion with noise levels measured under maximum silencing, the individual noise source contributions were estimated. This procedure was done at idle, throttle position 4 and throttle position 8. A summary of the results of this study at a distance of 100 feet to the side of the locomotive are shown in Table 3-1.

Table 3-1

Measured Source Contributions at 100 ft. for
EMD SD40-2 Locomotive, dB(A)

Source	Throttle Setting		
	Idle	Throttle 4	Throttle 8
Exhaust	66	78	84
Fan	59	70	83
Engine	62	67	66.5
TM Blower	47	64	72.5
Sum of 4 Sources	68	79	89
Overall Meas.	67	78	85

Based on these results, the study goes on to estimate that, with an exhaust silencer which reduces exhaust noise by 10 dB, the following reduction in overall A-weighted noise level would be achieved at 100 feet with 3 cooling fans operating.

Table 3-2

Estimated Noise Reduction for EMD SD40-2 Locomotives

Throttle Setting	Calculated Noise Reduction, dB
Idle	3 - 4
Throttle 4	4 - 5
Throttle 8	2 - 3

Significantly, no measurements with such a muffler were actually performed in this study.

The study reported in Reference 2 involved measurements of noise levels of both EMD SD40-2 and GP38 locomotives with and without extensive exhaust noise treatment. Coincidentally, the SD40 locomotive used in this study was the same locomotive (serial #6332) as used in the Reference 1 measurement study. The muffler used on both locomotives provided an attenuation of exhaust noise levels of about 18 dB as measured at 3 feet. The results of this study are provided below:

Table 3-3

Measured Noise Reduction for EMD SD40-2 and GP38-2 Locomotives

Throttle Setting	Measured Noise Reduction, dB	
	SD40-2	GP38-2
Idle	1.5	0
Throttle 4	6.5	6
Throttle 8	4	5.5

In contrast to the theoretical calculations of Reference 1, these measured results of exhaust noise silencing show little or no attenuation in overall level for an idling locomotive.

Appendix J of Reference 3 provides further measurements of far-field locomotive noise with and without an exhaust muffler. The measurements were made on a GP-9 locomotive before and after installation of two types of mufflers designed to force exhaust gases through a perforated inner lining. Noise measurements of the unmuffled engine were only made for the engine at throttle positions 1 and 8. The reported overall noise reductions at 100 feet are shown below:

Table 3-4

Measured Noise Reduction for EMD GP-9 Locomotives, dB

Throttle Setting	Snubber Muffler	Cross-Mounted Muffler
Throttle 1	0	1.5
Throttle 8	-1	3

For the snubber muffler, no noise reduction was achieved at throttle position 1 and an increase in level occurred at throttle 8. The report specifies, however, that due to a door inadvertently left open during the snubber muffler measurements, the test may be inaccurate. For the case of the cross-mounted muffler, 1.5 and 3 dB reductions were obtained at throttle positions 1 and 8, respectively.

A review was also made of the measured results reported in Appendices F and K of Reference 3, in which near-field exhaust noise spectra were compared with overall far-field noise spectra. We were unable to draw any definite conclusion due to the likelihood that the noise measurements made near a locomotive exhaust port would also include significant contributions from other sources as well. A general conclusion based on actual overall noise reduction achieved with locomotive exhaust mufflers is that while reductions of 3 to 6 dB are possible at high throttle positions, noise reductions at idle and throttle position 1 range from 0 to 1 dB.

Apart from the diagnostic data on the SD40-2 locomotive in Reference 1, no additional reports were found which identified noise emission levels of other locomotive engine noise sources. As shown in Table 3-1, the second most significant source at throttle 4 and throttle 8 is the cooling fans. At idle, the second most significant source is the engine/alternator. At idle, noise levels from all three cooling fans were reported in Reference 1 to be 3 dB lower than those from the engine/alternator. This report also notes that fan noise levels at idle were too low to permit diagnostic measurements of noise from less than three operational fans. These results imply little to no benefit would be achieved in reducing overall noise levels at idle by fan noise treatment.

3.2 Retarders

Considerable work has been done to control noise from railroad car retarders. References 4, 5, and 6 provide examples of research efforts directed at understanding the noise-generation mechanism and means of noise control. From studies such as these it has been learned that the retarder squeal noise is generated by a frictional slip-stick mechanism which causes the railcar wheel and retarder beam to vibrate. Noise control methods such as the use of ductile iron retarder shoes and application of lubricating fluids have been partially successful in reducing the number of retarder squeals which occur. Trial programs using these methods, however, have not demonstrated that the reduction in total noise generated when a squeal does occur is large enough to justify the resulting increase in operational and maintenance costs.

In addition to investigation of methods to eliminate the retarder squeal, considerable work has been done in evaluating the use of barriers around retarders to shield the adjoining community from the noise source. As pointed out in the background document, the two major railroad yards making use of retarder noise barriers are the Madison Yard operated by the Terminal Railroad Association of St. Louis, and the Northtown Yard operated by the Burlington Northern Railroad. In regard to the Madison Yard, we have reviewed reports of noise measurements taken before and after erection of the barriers and were not able to confirm the reported insertion loss of up to 25 dB.

There are three major reasons why we believe the Madison Yard data to be inappropriate for defining the barrier insertion loss.

First, in reviewing A-weighted noise level measurements taken by a representative of the Westinghouse Air Brake Company, the supplier of the barriers, an inconsistency was noted. Noise level measurements were reported before and after erection of the barriers for two microphone locations. At one location, 200 yards from the retarders, the difference in average retarder squeal levels with and without barriers was reported to be 18.3 dBA. At a second location at a point 100 feet from Group Retarder No. 1, average before-and-after measurements were reported for retarder squeals originating from Group Retarders Nos. 3 and 4. These reductions were on the order of 36 and 31 dBA, respectively. Since the barriers around Group Retarders Nos. 1 and 2 obstruct the direct line of sight to the measurement location, this measurement set likely does not reflect the actual attenuation provided by a single barrier.

The second point of concern in interpreting barrier insertion loss involves the limited number of positions at which noise measurements were taken near the Madison Yard. Physically the effect of a noise barrier with a sound-absorbing surface involves both a dissipation of acoustic energy as well as a geometric redistribution of acoustic energy. The redirection of sound results in a change of the overall directivity pattern of noise emitted from a retarder. In view of the limited number of measurement locations used in assessing retarder noise at the Madison Yard, it is difficult to determine whether the reduction in noise in the direction of the measurements was compensated by lesser reductions in other directions.

The third area of concern over the direct applicability of the Madison Yard measurements involves recognition of the variability of the amplitude of retarder noise squeals. Reference 7, for example, reports measurements of retarder squeals with an average of 107 dB for 23 squeals on one day and an average of 99 dBA for 99 squeals on the following day. This reference further points out that statistically these results imply a change in the basic noise-generating mechanism between these two days. If a change of as much as 8 dB can occur in average retarder squeal noise levels from one day to the next, it is doubtful that the source mechanisms can be assumed to hold constant over a much longer period of time. For a valid determination of noise barrier effectiveness, some additional measurements must be made (for example, in the near noise field of the retarders) to ensure that the noise source amplitude is not significantly different when comparing the barrier to the no-barrier noise measurements.

Based on the above discussion, we believe that although the Madison Yard measurements clearly indicate that the barriers provided a degree of reduction, there is no substantiation that a single similar barrier would provide a reduction up to 25 dB.

In addition to our review of the Madison Yard data, we reviewed the results of noise barrier measurements taken at the Burlington Northern Railroad's Northtown Freight Yard. At this yard, extensive noise measurements were conducted by personnel from the U.S. Department of Transportation's Transportation Systems Center and from the Industrial Acoustics Company. Noise measurements were taken with a microphone array about Group Retarder No. 3. An eight-foot-high barrier was in place on the easterly side of the retarder for all tests taken. Various barrier configurations were devised on the westerly side. The barrier insertion loss data provided in Figures 5-1, 5-2, and 5-3 of the background document appear to be taken from Reference 8. In addition to this report, we reviewed noise data provided to Burlington Northern on September 22, and October 7, 1975 by the U.S. Department of Transportation's Transportation Systems Center. Among the data provided were measurements of noise levels at a position perpendicular to the retarder at a distance of 100 feet for a variety of barrier configurations. A tabulation of the energy averages of measured levels at this location is shown below.

Table 3-5

Sound Levels for Various Barrier Configurations at Northtown Yard

Barrier Configuration	Energy Average A-Weighted Level at 100 feet, dB	No. of Freight Cars Tested
6-Ft Absorptive Barrier	99.9	20
8-Ft Barrier BN Specifications	98.7	25
12-Ft Absorptive Barriers With 11-Ft Extension of Either End and a 1-Ft Inner Lip	91.3	18

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A recently released draft of a Department of Transportation report on these measurements (Reference 8) indicates that, in an attempt to create higher noise levels for this test, car entrance speeds, retarder forces and car tonnage were higher than normal. Reference 4 however, states that laboratory experiments indicate that retarder squeal does not occur for very small or very large forces, but only for an intermediate range of forces. Reference 7 provides additional field measurements to show that retarder squeal does not depend on car weight. Therefore, it cannot be assumed, a-priori, that the noise levels made by the squeals in this experiment were indeed higher than those that would have been made under more normal conditions.

It is apparent from these results that even with the most extensive barrier treatment installed, this retarder would not have been in compliance with the proposed 90 dB at 30 meters (100 feet) retarder noise standard. Since this barrier configuration included additional construction features not accounted for in EPA barrier cost estimates and did not comply with the proposed standard, actual costs are expected to be significantly higher.

In addition to the problem identified above in meeting the 90 dB retarder standard, there are questions as to the actual effectiveness of a retarder barrier in reducing the L_{dn} levels at a railroad yard boundary. As verified by measurements, one effect of a barrier is to change the directivity of sound radiated from the retarder. The measured insertion loss of a 12-foot barrier as a function of angular location, as shown in Figure 5-2 of the background document, shows a sharp decrease in noise shielding towards the open end of the barrier. Some care must be taken in interpreting values shown on this figure. The report from which this figure was derived identifies the 10-, 30-, and 60-degree angle measurements points as being relative to the end of the barrier, while the 90° measurement point is relative to the center of the barrier. With all angles referenced to the center of the retarder, the actual measurement points correspond to angles of approximately 4.5°, 13.5°, 27°, and 90° angular positions. Taking an energy average of insertion loss at a projected 100-foot distance in a circular area around the barrier results in an average reduction of only 10 dB. Since the retarders themselves lie at various angles to the property boundary, this figure is more indicative of the overall noise reduction effectiveness of a retarder barrier.

Another question arises as to the insertion loss the barrier would provide at distances greater than 100 feet, which would be more indicative of actual property line distances. It is well established that at distances far from a source over a sound-absorbing boundary such as grass or soil, increasing the effective source height reduces the excess attenuation provided by the ground. Since the sound diffracting over the top of the barrier constitutes a raised source height, it is unclear how much net reduction a barrier will provide at more realistic propagation distances. Thus, at large distances, the average insertion loss due to barriers may be even less than the 10 dB mentioned above. Unfortunately, no measured data regarding this point seems to exist in published studies on the subject.

3.3 Refrigerator Cars

The proposed EPA noise standard for railroad refrigerator cars sets a maximum A-weighted noise level of 78 dB at a distance of 7 meters from the track centerline. To examine the feasibility of complying with this standard, a compilation of data was made of refrigerator car noise levels at the maximum operational mode. The data includes recent measurements taken by railroad companies as well as previously published data as reported in Reference 9. Data from truck-mounted refrigeration units was not included. Based on measurements from 50 different railroad refrigerated cars, the energy-average of maximum levels at 7 meters was found to be 85 dB. Of the 50 cars tested, only two were found which would have been in compliance with the proposed standard.

To explore further the divergence between actual noise emission levels and the regulatory limit, a review was made of refrigerator car noise source data provided in the background document. This document lists in Table 4-1 an energy-average level for railroad refrigerator cars of 63 dB at 30 meters (100 feet) based on a sample of 27 measurements (the statement that 60 measurements were made is a typographical error). A review was made of supporting documentation for this result as provided by the EPA. Of the 27 measurements reported, only five were actual measurements taken with railroad car refrigeration units. These five measurements consisted of high and low throttle operation noise levels for two refrigerator cars plus an additional measurement with the diesel engine off and compressor powered by a 220v electrical line. The remaining 22 noise values were of a single truck-mounted refrigerator unit measured at both high and low speed operations with an 11-microphone array. Clearly, an average of such divergent data has no real relationship to maximum railroad refrigerator car noise emission.

In the 1979 background document, EPA states that technology developed for truck- and trailer-mounted refrigeration units would provide an estimated 4 dB reduction for railroad refrigerator cars. The technology identified and included in EPA compliance cost estimates consisted of a "better" muffler for the diesel engine and application of sound-absorptive foam.

The transfer of noise control technology developed for truck-mounted refrigeration units to railroad car refrigeration is predicated on the assumption that the acoustical and operational characteristics of the two are sufficiently similar. However, evidence exists to the contrary. First, it should be noted that railroad refrigerator units are intrinsically louder than their truck counterpart. As reported in Reference 10, the average A-weighted noise levels at 50 feet for 16 truck-mounted refrigeration units operating at maximum mode was approximately 72 dB. Extrapolation of the corresponding data for railroad refrigeration units in Table 2-1 of this report yields a value of 78 dB. Therefore, in the maximum operating mode, the railroad refrigeration units produce an average overall level 6 dB higher than truck-mounted refrigeration units. Second, it is appropriate to examine some of the physical differences between the two types of units The diesel engines used to power truck-mounted units are four-stroke engines of the following three models: Mercedes OM636, Isuzu C201, and Perkins 4.108. The diesel engines used in railroad applications are two-stroke Detroit Diesel Models 2-71 and 3-53. As an example of the differences, the two-stroke engines require a supercharger or "blower" to force air into the cylinders. Without comparative measurements of the exhaust noise levels of these different engines, it is impossible to predict the effectiveness of an improved exhaust muffler.

With few exceptions, truck-mounted refrigeration compressors are powered directly by the diesel engine. For railroad refrigeration units, the diesel engine is used to drive an electrical generator which in turn drives the compressor. Because of the more restrictive space and weight limitations for truck-trailer units, the physical arrangement of components is significantly different from railroad car units. A typical arrangement in a truck unit, for example, is to have a single fan provide air flow for the condensor as well as the diesel engine radiator. Railroad refrigeration units have separate fans for the condensor and radiator.

Based on the physical differences as described above, we feel that insufficient information exists to support the view that truck-trailer refrigeration noise technology is directly applicable to railroad car refrigeration units.

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4.0 HEALTH AND WELFARE IMPACT

The health and welfare impact study in the background document presents a mathematical model for the prediction of railroad yard noise impact for present noise levels and for proposed regulatory boundary line levels. The elements of the model include:

- Definition of an "average yard" (in terms of size, noise source location, and activity rates) for each of a series of yard type/function, activity level, and place size classifications.
- Development of a noise propagation model for each yard classification in terms of the estimated individual source levels from Section 4, the "average yard" geometry and activity rates, and propagation models based on the individual noise source spectra and the adjacent population density (for shielding effects due to buildings).
- Prediction of number of people living in various L_{dn} bands around the yard using average population densities from census data.
- An Equivalent Noise Impact (ENI) and Relative Change Impact (RCI) analysis using a linear approximation to the current CHABA (Committee on Bioacoustics and Biomechanics) noise impact curve in terms of L_{dn}.

The output of the model is a table giving the "equivalent number of people impacted" (ENI) for the baseline case and for a series of four study levels cases in which the maximum rail yard boundary L_{dn} is 75 dB, 70 dB, 65 dB, and 60 dB.

Before presenting comments on detailed aspects of the model, three general comments about its overall logic and accuracy should be considered. First, the model, as presented, considers only railroad yard noise sources. The impact associated with the sound levels attributed to these sources is summed to a distance from the yard boundaries at which the estimated L_{dn} from these sources has decreased to a level of 55 dB. However, around most railroad yards the L_{dn} contribution from non-railroad sources exceeds 55 dB. Any reduction of the railroad yard noise level in the community to values less than 3 dB below the level due to non-railroad noise sources will produce little benefit to the community; the impact will remain essentially the same. Thus the ENI figures given are overestimates of the effective ENI of the railroad noise.

Although the logic of the model, when corrected as described below, would produce an ENI value that is technically due to the railroad yard noise, this figure is not meaningful in a practical sense. The impact of noise on a community is a function of all the noise it hears, not just of one component. This is especially true when one discusses changes in the ENI due to changes in single components of the total noise level. For example, if the railroad noise contribution in a community lies more than 3 dB below the sum of the noise contributions from non-railroad sources, even complete removal of the railroad noise will have little effect on the resultant impact in the community.

The second point to be made is that throughout the entire impact analysis no attention is paid to the statistical accuracy of the model. There are many estimations made which appear to have large uncertainties associated with them. For example, the distances from the sources to the boundaries and the estimates of the yard dimensions all exhibit extremely large confidence ranges. The assumed uniform distribution of the population around the yard boundaries is also questionable. Even the "randomness" of the selection process used to choose which yards would be sampled is in doubt since the technique used would produce a different sample error for each cell. When all of these possible error bounds are applied to the inputs to the noise impact model, the statistical uncertainty associated with the resultant output may become quite large.

Finally, there is a technical error made in the ENI calculation. The method used calculates the ENI individually from various source groups, and then sums these values of ENI in order to arrive at a total ENI for each yard. Because of the logarithmic nature of the decibel, this method is technically incorrect. The proper method would be to calculate the total L_{dn} at points in the community due to all contributing sources, and then calculate the total ENI. As it is now constructed, the model overestimates the total ENI.

The model presented in Section 6 of the background document is quite complex and reference is made to various appendices in the background document. In order to follow the complete train of logic of the model, the detailed comments below will refer not only to parts of Section 6, but also to the appropriate appendices where necessary.

Page 6-3. The document carefully points out that the noise impact model derived in this section is extremely statistical in nature. It can therefore be used only to estimate the total population impacted by railroad yard noise. It is not designed for, and cannot be used to, estimate the magnitude of the population impacted by the operation of a single specific rail yard.

Being a statistical model, there should be some effort spent in determining the accuracy of its predictions. At no point in the document are error bounds presented or their implications discussed. Thus it is impossible to estimate the reliability of any of the calculated ENI values.

For example, based on data provided by EPA for a sample of 12 engines, the average distance between the switching engines in low density area hump yards and the far boundary is 662 feet. The standard deviation associated with this average is 519 feet. The resultant 90-percent confidence limits for the population average over all such yard types are 416 feet and 909 feet. That is, there is a 90-percent probability that the average of this measurement over all yards of this type lies between these two distances. Tables 4-1 through 4-4 below present additional examples of the uncertainties associated with various of the average distances used in the impact model.

Similar analyses should have been performed to determine the confidence limits on both the source levels and the number of occurrences for each type of railroad yard noise source event. Indeed, Table 2-1 in Section 2 of this report shows such confidence limits for the average noise levels used in the model. The resulting statistical errors should have been propagated through the model equations to obtain an estimate of the statistical error associated with each calculated ENI value. Because this has not been done, there is no way to assess quantitatively the accuracy of the estimated impact values.

Since the differences between the estimated impact figures for each of the regulatory study levels is small compared to the overall value of the impact, it is quite possible that these differences are comparable to or smaller than the statistical errors associated with the estimates. If this is the case, then no reliable conclusions can be made as to the relative superiority of one regulatory level over another.

Page 6-9. The decision that only rail yard noise be considered in the model is questionable. In four out of ten rail yard sites for which we have data describing the relative contribution of each noise source to the total hourly L_{eq} (see Section 2), non-railroad noise was the dominant noise source. In two of the other sites, non-railroad noise was a major contributor to the hourly L_{eq} with airplane flyovers and traffic noise being the largest non-railroad contributors. Thus, as was pointed out above, reductions in ENI cannot be accurately calculated.

Table 4-1

Confidence Limits on the Mean of the Distance Between the Main Retarder and the Near and Far Boundaries of the Hump Yards Analyzed in the EPIC Study Data

Yard Type	Boundary	No. of Samples	Mean Value, ft.	90% Confidence Limits, ft.	
Low Density Hump Yard	Near	12	349	242	456
	Far		856	628	1084
Medium Density Hump Yard	Near	11	361	253	469
	Far		663	543	783
High Density Hump Yard	Near	7	168	94	241
	Far		768	325	1212

Table 4-2

Confidence Limits on the Mean of the Distances Between Switching Engines and the Near and Far Boundaries of the Hump Yards Analyzed in the EPIC Study Data

Yard Type	Boundary	No. of Samples	Mean Value, ft.	90% Confidence Limits, ft.	
Low Density Hump Yard	Near	12	361	174	548
	Far		662	416	909
Medium Density Hump Yard	Near	11	477	330	623
	Far		480	352	644
High Density Hump Yard	Near	7	343	191	495
	Far		418	229	606

Table 4-3

Confidence Limits on the Mean of the Dimensions of Industrial Flat Yards Calculated From the EPIC Study Data

Yard Type	No. of Samples	Dimensions	Mean Value, ft.	90% Confidence Limits, ft.	
Low Density Industrial Flat Yard	15	Width	421	274	568
		Length	6342	4981	7703
Medium Density Industrial Flat Yard	15	Width	294	241	347
		Length	3426	2766	4086
High Density Industrial Flat Yard	11	Width	641	364	917
		Length	3230	2953	3506

Table 4-4

Confidence Limits on the Mean of the Dimensions of Small Industrial Flat Yards Calculated From the EPIC Study Data

Yard Type	No. of Samples	Dimensions	Mean Value, ft.	90% Confidence Limits, ft.	
Low Density Small Industrial Flat Yard	11	Width	311	205	418
		Length	3206	2603	3808
Medium Density Small Industrial Flat Yard	13	Width	326	192	461
		Length	4051	3325	4778
High Density Small Industrial Flat Yard	9	Width	414	214	614
		Length	3467	2036	4898

Page 6-9. As stated in the introduction to this section, the presumption in the impact model that there is no significant overlap in noise exposure due to multiple noise sources is not necessarily valid. For example, in the case of small industrial flat yards, two composite noise sources were identified. The calculations for ENI were done first for source group (a) and then for source group (b). The ENIs from each source were then summed to get the total ENI. Thus some of the same people counted as being impacted by the source group (a) were counted again as being impacted by the source group (b). The correct method of computation would be to determine the total L_{dn} based on all sources within the boundaries and calculate the ENI from that number. To illustrate this point, the total number of people exposed to L_{dn} levels 55 dB and above was calculated for industrial flat yards using both methods and the results compared.

Using the method specified by the model in the background document, the results show that 1,060,000 people are exposed to the noise radiated from source group (a) (L_{dn} = 69 dB at the yard boundary), and 280,000 people are exposed to the noise radiated from source group (b) (L_{dn} = 63 dB at the yard boundary). Thus, according to this method, a total of 1,340,000 people are exposed to L_{dn} levels 55 dB and above from noise radiated from industrial flat yards.

When done properly the total L_{dn} at the yard boundary.was first calculated, in this case 69 dB + 63 dB = 70 dB. Next, based on this level the total number of people exposed to an L_{dn} above 55 dB was calculated resulting in a figure of 1,130,000 people. Thus in this one case the model used in the background document overestimated by 16 percent the number of people exposed.

Due to the fact that the individual source levels for hump yards and for flat yards are much higher than those used in this example, it is expected that for such yards the model used in the background document will overestimate by an even greater amount the number of people exposed to levels in excess of L_{dn} 55 dB.

Page 6-16. The random selection process used to choose the 120 representative yards suggests a possible bias to force even distribution of 10 yards per cell when the 300-yard random sample was not evenly distributed by cells. Thus the sample error is not the same for each cell.

Page 6-23. The activity rate of a rail yard was estimated solely on the basis of its physical size. This concept that yard size and yard activity level are related is not necessarily valid. A yard may be large because its activity was large when it was first built and its activity may now be lower. On the other hand, a yard that has high activity now may be small because the activity was lower when it was built or because only a limited amount of land was available.

Pages 6-24 to 6-28. Because of the small size of the sample studied, the average dimension calculated from the EPIC data appears to have large statistical errors. As illustrated in Tables 4-3 and 4-4, the confidence limits on these averages can be quite large. Thus there is a serious concern about the usefulness of the estimated average distances.

In addition, the use of arithmetic average distances to compute estimated energy average levels at the receiver position can lead to an underestimate of the predicted levels. It would be more appropriate to use a logarithmic mean distance in this case instead of an arithmetic mean.

Page 6-27. There is concern about the applicability of distinguishing between road-haul and switching locomotives. Many yards use out-of-service road-haul locomotives as switching engines, so that it would be impossible to determine the use of a given locomotive from a satellite photograph. Thus the distinctions which were, in fact, made as part of this study, must be assumed to have been made arbitrarily, and therefore the data included in Tables 6-8 and 6-9 of the background document concerning the distances D_{RL} and D_{SE} are questionable.

Page 6-32. The assumption of uniform population distribution about the yard is probably incorrect. The area immediately adjacent to railroad yards is often occupied by highways and industrial and commercial properties. For many large hump and flat yards, residential areas usually do not abut directly on the yard boundaries, except possibly at the extreme ends of the yard. Thus, it is more reasonable to expect that the population density would be low immediately adjacent to the yard and gradually increase with distance from the yard. If such is the case, the number of people in the areas of high rail yard noise will be less then the model predicts and thus, the actual ENI will be less than is estimated.

Page T-1 of Appendix T. It is noted that for "yards located in scarcely populated areas, the study had to be enlarged to include at least one population centroid" of the census data. This in effect arbitrarily increases the value used for the constant population density around the yard. The statement is made that, if the study area contains 500 or more people, the accuracy of the population estimate is at least 10 percent. This does not mean that the accuracy of the population density estimate is 10 percent. If so few people are living in the vicinity of the yard that the study area must be enlarged, then it is unlikely that very many of the people in the enlarged study area live in the immediate vicinity of the yard. Thus, an overestimate of population density is again employed, leading to an overestimate in ENI. In addition, no indication is given of how many of the 120 randomly chosen yards whose adjacent population density was studied actually fell in this "scarcely populated" category, so that it is impossible to assess the extent of this overestimate.

Pages 6-33 to 6-38. The assumption in Table 6-10 that the distribution of population densities, as averaged over yards of all types, holds for yards of each type is questionable. In particular, the subset of hump yards is such a small portion of the total of all yards that this assumption is almost certainly incorrect. This is especially apparent when one considers that, because of its size and nature, a hump yard is generally located in an industrial region with a low population density, while smaller flat and industrial yards — which, because of their greater numbers, control the average — may be located in regions of higher population density. Thus, the population densities attributed to areas around hump yards in Table 6-11 of the background document may quite likely be overestimates.

Pages 6-42. As pointed our earlier, there are non-railroad sources which can dominate the local L_{eq}. These sources may include aircraft flyovers and local road traffic.

Page 6-56. In determining the ENI for each yard type, the impact calculation was carried out to a distance at which the L_{dn} value for railroad noise decreased by 55 dB. As pointed out above in the general discussion on this section, it is more realistic to carry out this calculation only to the point at which the railroad L_{dn} falls 3 dB below the L_{dn} due to non-railroad sources. This would, of course, reduce the estimates of ENI.

To illustrate this point, consider the residential neighborhood components of day-night sound level listed in Table 4-5. These have been computed by substituting the population densities given in Table T-3 on page T-4 of the background document into the equation: $L_{dn} = 22 + 10 \log$ (population density). It is seen that, in the majority of cases, the L_{dn} component due to to background noise in residential neighborhoods is above 55 dB. The situation would, of course, be even more pronounced if the L_{dn} components from other non-railroad sources such as nearby highways, aircraft flyovers, and industrial facilities were also included.

Table 4-5

Residential Neighborhood Component of Day-Night Sound Level Using: $L_{dn} = 22 + 10 \log$ (Population Density)

Population Density Range (People/Sq. Mi.)	Place Size <250,000 People	Population Density Range (People/Sq. Mi.)	Place Size >250,000 People
<500	46	<1000	48
500 to 1000	50	1000 to 3000	54
1000 to 2000	54	3000 to 5000	58
2000 to 3000	56	5000 to 7000	60
3000 to 5000	58	7000 to 10,000	61
5000 to 7000	60	10,000 to 15,000	63
7000 to 11,000	62	15,000 to 22,000	65

5.0 MEASUREMENT METHODOLOGY

The measurement methodology, described in Subparts C and D of the Notice of Proposed Rulemaking (NPRM), has been reviewed and has been found lacking in several areas. Major weaknesses include incomplete specification of measurement systems, descriptions of permissible sites which are inconsistent with accepted measurement practices, failure to allow tolerances for realistic field conditions, and a potentially unworkable procedure for component L_{dn} determination. The following is a specific listing of comments by paragraph in the NPRM.

5.1 Review of Subpart C: Measurement Criteria for Specified Railroad Equipment/ Facility Items

§201.22(a). The standard specified for sound level measurement systems allows certain tolerances in accuracy. For Type 1 instrumentation and typical railroad sources, the tolerance is ±1 dB. A 1 dB tolerance above the regulatory levels in Subpart B should therefore be allowed.

§201.22(b). There is no American National Standard S1.3-1971 currently listed. The reference apparently should have been to S1.13-1971. It should be specified whether the laboratory, field, or survey method described in this document is to be followed.

§201.22(c). A specification must be included as to the accuracy of the field calibration device, and that it be traceable to the National Bureau of Standards. The accuracy tolerance of the calibrator should be added to the overall measurement tolerance for enforcement purposes.

§201.25(b). "Miscellaneous objects" are permitted between the microphone and the equipment. Except for requiring that objects breaking line-of-sight be closer to the equipment than to the microphone, no quantitative description is given. There is also no description of permissible surfaces. It is well known that the material and geometry of reflecting surfaces can substantially affect measured sound levels. EPA's Interstate Motor Carrier Regulation[1] and the corresponding DOT/BMCS enforcement procedures[2] specify limits on the size and type of objects normally acceptable at truck noise test sites, and also notes a 2 dB difference between measurements at sites with hard and soft ground surfaces. Thus, the site surface and allowable reflecting objects must be specified more precisely. Alternatively, a margin must be permitted above the regulatory levels to also for increased noise levels due to uncontrolled site features.

§201.25(c). Other railroad equipment is permitted behind the equipment being measured. No restrictions on the nature or position of this equipment are specified. Equipment with large flat surfaces (such as boxcars) can act as reflectors, increasing measured noise by up to 3 dB. Correction procedures should therefore be included to compensate for this. Equipment which emits noise (refrigerator cars, retarders, locomotives, etc.) and is located in this area can also increase measured noise levels. This section should be modified to ensure that other noise sources are excluded from areas where they would add to the measured noise.

§201.25(d). A wide variation in terrain height is permitted. It is well known that terrain can be critical to accurate noise measurements. For example, at a specially prepared, symmetrical, motor vehicle noise test site with propagation distance of 15 meters (50 feet), consistent differences of up to 2 dB were found between the two sides.[3] These differences were found to be due to a difference in flatness on the order of inches between the two sides. In general, up to ±3 dB uncertainty can be expected for broadband noise sources (greater uncertainty is possible for tonal sources such as retarders) if a specific ground contour is not required between source and receiver.[4] Given that ideal sites are difficult to obtain in railroad yards, a tolerance must be added to the regulatory levels to account for possible increases in measured level due to ground contours.

§201.25(f). No specification is made as to the quality of instrumentation to be used for wind speed measurement, nor the height at which the wind is to be measured. The allowable speeds are also somewhat high; it is normal practice to limit allowable speeds to 19.3 kph (12 mph) including gusts (see, for example, the various SAE vehicle and equipment noise test procedures[5]). Recommendations have recently been made to restrict wind speeds to 16 kph (10 mph) where precision is required;[6] this is for a case where the microphone is 7.5 meters (25 feet) from the source. The effect of wind on propagation becomes even more pronounced at larger distances. Based on the analysis of Reference 4, instantaneous fluctuations in noise at 30 meters with a 20 mph gust could exceed ±4 dB up to 5 percent of the time. In practice, the more extreme peaks will be diminished by the response time of the instrumentation; however, some tolerance must be allowed under high wind conditions.

§201.26(a). The microphone height may be between 1.2 meters and about 4.5 meters (depending on the height of the particular car) above the ground. The data on which the regulatory levels for refrigerator cars are based are for 1.2-meters-high microphones. As discussed in Reference 4, height can seriously affect the interference pattern between direct and ground-reflected sound. Differences of several decibels can occur. If this wide range of microphone heights is to be permitted, then an additional tolerance must be allowed.

§201.26(b). The energy average of at least ten car coupling events is to be obtained. No sampling or reporting standards are specified. It is possible to measure a large number of cars and report an average of any ten. Some sampling techniques must be specified to ensure that (a) the number of cars sampled is statistically meaningful; and (b) the selection and reporting is not subject to bias.

§201.26(c). A sampling problem similar to that described in (b) immediately above exists for squeal noise events in retarders.

§201.26(d). The adjustment for alternate measurement distances, Table 3, is apparently based on geometrical spreading alone. This is not an accurate correction procedure. It is known that propagation from railroad sources is significantly affected by the ground surface and thus does not always follow geometric spreading.[7] Table 3 should be replaced with correction factors based on actual data for each type of noise source. With regard to refrigerator cars, the source is not necessarily located at the track centerline (the reference position for distance measurement), so that there is a question as to the appropriate reference location. This should be examined and clarified.

5.2 Review of Subpart D: Measurement Criteria For Receiving Property

§201.31(a). There are currently no national or international standards for integrating sound level meters. The specification given here is that the sound level meter, when combined with an ideal integrator, satisfy the ANSI S1.4-1971 tolerance for Type 1 sound level meters; an additional tolerance is permitted for events less than one second. Time and level ranges over which this must be satisfied are given. This description is inadequate for the following reasons:

- The specification is for an ideal integrator. Since no electronic circuit is ideal, the tolerances must be increased to allow for real instrumentation. Tolerances must be specified for accuracy of the integrator, and for accuracy of the time base for L_{eq}.
- Since much of the L_{eq}/L_{dn} measuring equipment commercially available is digital with discontinuous sampling, a specification of minimum sampling rate is required. Alternatively, an appropriately designed test signal format can be specified which the system must be capable of measuring.
- The specification is for times no longer than one hour. This is inconsistent with the measurement of L_{dn} (permitted in §201.33(a)), which is over a 24-hour period.

Given the error inherent in any measurement system, and allowed in the specified tolerance, a tolerance above the regulatory levels in Subpart B must be allowed. For L_{eq}/L_{dn} measurements, with the added process of integration, this would have to be larger than that discussed earlier for §201.22(a). The additional amount would be based on the integrator tolerances which are to be defined.

§201.31(b). Other types of field calibration should be permitted. Accuracy of calibration and traceability to the National Bureau of Standards must be specified. Calibration tolerance should be added to the overall measurement tolerance.

§201.32(b). The "residential dwelling measurement surface" is inconsistent with the requirement of reflecting surfaces, and will cause noise levels to be increased. Distant source levels can be increased by as much as 3 dB; sources as close as 30 meters will be increased by 2 dB. L_{dn} is customarily used to describe the noise environment away from vertical reflecting surfaces. The use of this measurement surface results, in effect, in the regulatory levels in residential areas being 3 dB more stringent than those presented in Subpart B. If this is the intent, then the required levels should be explicitly stated consistent with the usual conventions, and presented in Subpart B.

§201.32(d). Since precipitation is an uncontrolled event, it would be impossible to assess its effect on noise measurements. No enforcement data should be collected during precipitation.

§201.33(b). See comment under §201.32(b).

§201.33(d). The methodology for demonstrating clear dominance is extremely involved and would entail a major effort. Estimating methods specified for each subsource are inadequate. In addition, no model exists for estimating the L_{dn} contribution from neighboring industrial and commercial facilities. Specific comments on the models that do exist are given below:

(1) Calculation of component sound levels from non-railroad sources.

(i) The formula $22 + 10\log_{10}$ (population density) was derived in Reference 8, from measurements at 100 urban sites. This regression formula has a standard deviation of 4 dB. The requirement that the residential neighborhood component of L_{dn} be estimated to be equal to or less than this quantity means that L_{dn} will be underestimated in at least half the cases. In about one-quarter of applications, it will be underestimated by 3 dB or more. This puts serious doubt on the determination of dominance if the railroad sources are not greater than 6 dB above the level from other sources.

(ii) The method cited[9] is a reasonable one for the application. Its major drawbacks are that (a) it was published in 1977 and at least one new type of aircraft is not included; and (b) it applies to civil aircraft only. Some provision for update of data is necessary and the methodology must be extended to include military aircraft. It is also not reasonable to exclude all other methods, which can be equally or more realiable and in some cases easier to use. For example, Reference 10 is a pocket calculator procedure based on the same method and data as Reference 9. Consideration should be given to utilizing existing noise calculations, available in many cases from the agencies which would have to be contacted to obtain data required by Reference 9.

It should also be noted that aircraft noise can be significant in cases so far from an airport that the occurrence of overflights is unpredictable.

For example, at one yard reported in Appendix B of the background document, the L_{eq}'s of certain hours were dominated by single aircraft flyovers. Any airport noise prediction method gives estimates which are valid only in an average sense. The variability in noise among aircraft of a given type (as classified in prediction models) is large; standard deviations of 4 to 5 dB are typical.[11] This can be significant when few overflights are involved, and a corresponding tolerance must be allowed. The models (including Reference 9) were designed for use as planning tools, not for enforcement of regulations.

(iii) The highway noise model specified[12] is obsolete. In the memorandum announcing availability of this model[13] it was emphasized that it was an interim step which would be revised in mid-1977. At least one specific deficiency was cited in that memorandum. The Federal Highway Administration has prepared a new model for prediction use.[14] After July 1, 1979, FHWA policy[15] requires that noise prediction calculations be consistent with the method of Reference 14. For consistency with the current state-of-the-art and accepted prediction methods, the FHWA method should be specified here.

The inaccuracies inherent in highway prediction models must also be accounted for. Based on comparisons between model predictions and field measurements,[16,17] the accuracy of prediction is typically ±3 dB. A corresponding tolerance must be allowed.

(iv) It is not apparent how L_{eq} can be determined for through trains without a procedure to ensure that the measured L_{eq} is indeed dominated by the through trains. A procedure must be given. If through train L_{eq} is to be calculated from measured SEL, the specification of measuring at least five trains is technically inadequate. A sampling procedure must be included to select a statistically valid sampling of trains.

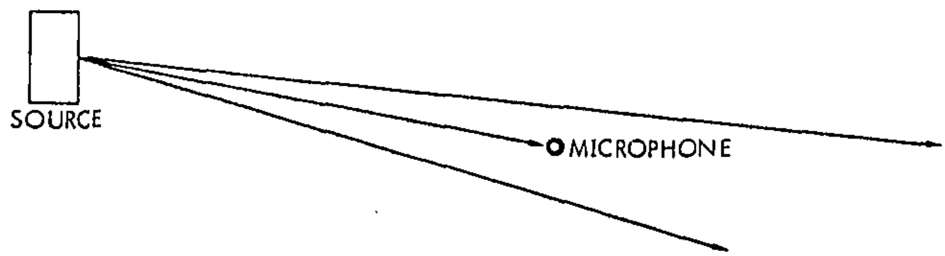
(v) At a site where railroad operations dominate the noise environment, it would be impossible to measure directly L_{eq} or L_{dn} from any other source.

(2) Comparison of hourly L_{eq} measurements to determine railroad "clear dominance".

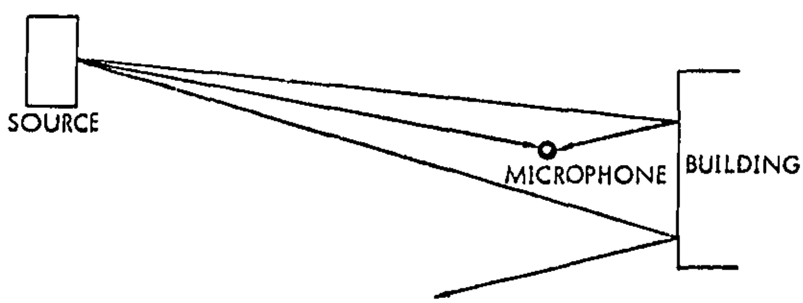
The procedure described in this section will not work in many situations. L_{dn} is to be estimated from hourly L_{eq} measurements, but there must be some periods where other sources dominate. If hourly L_{eq} from each source can vary so widely within the specified 4-hour period, it is impossible to make a rational estimate of L_{dn} from one hour's data. The procedure is also technically questionable because it specifies human judgment in assessing the dominant sources for an hourly L_{eq}. Accurate judgment of dominant sources is reasonable only for single events.

§201.33(e). The determination that the railroad noise dominates is based on the same procedure as used to test for clear dominance in §201.33(d). Since this method is unworkable, as discussed above, a determination of dominance would also not be feasible.

The requirement in (2) to calculate railroad contribution is not well presented. The calculation is quite involved; see for example the railroad yard noise model of Reference 7. It is not sufficient to specify so complex a calculation without providing a tested methodology.



a. "Free-Field" Condition In Which Microphone Receives Only Direct Sound.



b. With a Reflecting Surface Nearby the Microphone Receives Both Direct and Reflected Sound. In this case, the acoustic intensity measured is typically twice as great as in the free-field situation above, resulting in a sound level that is 3 dB higher.

REFERENCES

1. Environmental Protection Agency, Final Noise Emission Standards for Motor Carriers Engaged in Interstate Commerce (Title 40, Code of Federal Regulations Chapter I, Part 202, 39 FR 38208, October 29, 1974).

2. Department of Transportation, Bureau of Motor Carrier Safety Regulations for Enforcement of Motor Carrier Noise Emission Standards (Title 49, Code of Federal Regulations Chapter II, Part 325, 40 FR 42437, September 12, 1975, Effective October 15, 1975, Amended 41 FR 10227, March 10, 1976, 41 FR 28267, July 9, 1976).

3. Bettis, R.A., and Sexton, M.Z., "The Effect of Test Site Topography in Vehicle Noise Measurement", Paper II10, 85th Meeting of the Acoustical Society of America, April 1973.

4. Sharp, B.H., Plotkin, K.J., Davy, B.A., and Sutherland, L.C., "A Study of the Effect of Environmental Variables on the Measurement of Noise From Motor Vehicles", Wyle Research Report WCR 74-18.

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12. Rudder, F.F., and Lam, P., "User's Manual: TSC Highway Noise Prediction Code: Mod 04", FHWA-RD-77-18, January 1977.

13. "Noise Prediction Methods", FHWA Notice N6640.11, July 15, 1977.

14. Barry, T.M., and Reagan, J.A., "FHWA Highway Traffic Noise Prediction Model", FHWA-RD-77-108, December 1978.

15. "Traffic Noise Level Prediction Methods — Amendment", Title 23, Chapter 1, Subchapter H, Part 772. Federal Register 43, 193, October 4, 1978, p. 45838

16. Plotkin, K.J., and Kunicki, R.G., "Comparison of Highway Noise Prediction Models", EPA Report 550/9-77-355, May 1977.

17. Kugler, B.A., and Piersol, A.G., "Highway Noise — A Field Evaluation of Traffic Noise Reduction Measures", NCHRP Report 144 (1973).

APPENDIX A

Analysis of Contributions to Boundary Line $L_{eq}(1)$ Measurements

The purpose of this study was to determine for selected sets of measurements the contribution of various railroad and non-railroad sources to the hourly L_{eq}. To achieve the goals of this study the following tasks were performed:

- Construction of models that relate sound exposure level (SEL) to peak level and duration for typical railroad noise events.
- Determination of peak level and duration for each event during selected hours at 14 railroad yard measurement sites from available annotated strip charts.
- Combination of the above to estimate the contribution to the hourly L_{eq} for each type of railroad noise source.

A.1 Construction of a Model

The construction of models that relate SEL to peak level and duration involved the simultaneous use of the tape recordings and strip charts made at the Wilsmere Yard, Wilmington, DE; the Pavonia Yard, Newark, NJ; and the Barstow Yard, Barstow, CA. SEL models were developed for each of the following sources: locomotives moving, railcars moving, and retarder and wheel squeals. For each event an L_{eq} was obtained by playing the tape recording into a Metrosonic 602 Environmental Noise Analyzer. The duration of the event was obtained using a 1/100 sec timer. The SEL was computed for that event from the measured L_{eq} and duration. This analysis was performed for each event occurring on the tape recordings. From strip charts made simultaneously with the tape recordings, peak levels and durations for the events were obtained. The average value (α_{ave}) of the ratio of the energy-effective duration of a single event to its nominal duration was computed using the relationship:

$$\alpha_{ave} = \frac{1}{N} \sum_{i=1}^{N} \frac{t_{ref}}{T_i} 10^{(SEL_i - L_{max_i})/10}$$

where SEL_i = sound exposure level for the i'th event of a given type as measured from the tape recording;

L_{max_i} = peak level for that event as measured on the strip chart;

T_i = nominal duration for that event as measured on the strip chart (i.e., the time between significant deviations from the ambient level);

N = number of events of the given type; and

t_{ref} = reference duration = 1 sec.

The values of α_{ave} that resulted for each source are shown in Table A-1.

Table A-1

Values of α_{ave} for Various Source Types

Source	α_{ave}	90% Confidence Limit
Locomotive Moving	0.26	0 - 0.54
Railcar Moving	0.14	0 - 0.30
Retarder & Wheel Squeal	0.31	0 - 0.70

In addition, for other sources, an α_{ave} of 0.5 was assumed if the duration was less than 5 sec while an α_{ave} of 1.0 was assumed if it was equal to or greater than 5 sec.

In analyzing the annotated strip charts, for which no tape recordings were available, an SEL for each source event was calculated by the following equation:

$$SEL = 10 \log_{10} L_{max} + 10 \log_{10} \left(\frac{T}{t_{ref}}\right) + 10 \log_{10} \alpha_{ave}$$

where L_{max} = peak level for the event;

T = duration for the event;

α_{ave} = the average duration ratio for the source type.

A.2 Determination of Peak Levels and Duration for Fourteen Railroad Yards

The peak levels and duration of noise events during selected hours at 14 measurement sites were determined. The hour selected at each site was based on the hourly L_{eq} and on how well the strip chart was annotated for that hour. For each hourly segment a list of the peak levels and durations of all noise events were obtained. Also, a list of the background levels and durations were obtained. The list of yards and selected hours are presented in Table A-2.

A.3 Contribution of Various Sources to the Hourly L_{eq}

The contribution of various sources to the hourly L_{eq} involved the following steps:

- Substitution of the peak level and duration measured for each noise source event in Section A.2 into the model developed in Section A.1 in order to calculate an SEL for each event.
- Combination of the SELs for all events of the same type (e.g., locomotive moving, retarder squeals, etc.) at a given site to obtain the total SEL during the measured hour for each noise source type.
- Computation of the total SEL and hourly L_{eq} for all sources at the site.
- Computation of an hourly L_{eq} contribution for each of the noise sources along with the percentage of acoustic energy it represented.

A.4 Summary of Results

The detailed results of this analysis are presented on the following pages. Also included is a summary of the results of two similar analyses that were done previously for data gathered at the Barr Yard in Riverdale, IL, and at the Cicero Yard in Cicero, IL. The details of these two studies have been included on page 358 and 388, respectively, of EPA's background document.

The format of the analysis for each yard is as follows. First, the durations, maximum levels, SEL's, and percent of total energy are presented for each noise event of a given type that occurred during the measurement period. Following this, is a summary of the duration, SEL, LEQ, and percent of total energy for each noise type.

Table A-2

Railroad Yards Analyzed for SEL Model

Site No.	Yard	Date	Hours
31-1	Roseville	February 3, 1978	0900-1000
32-1	Richmond	February 8, 1978	1600-1700
33-1	Barstow	February 18, 1978	0300-0400
33-3	Barstow	February 17, 1978	2200-2300
41-1	Brosnan	February 2, 1978	1200-1257
41-1	Brosnan	February 2, 1978	1300-1400
42-1	Mays	February 9, 1978	2200-2300
43-1	Settegast	February 17, 1978	1100-1200
51-1	Dillard	February 3, 1978	1500-1555
52-1	Johnston	February 16, 1978	1800-1900
52-2	Johnston	February 16, 1978	1003-1100
1	Wilsmere	April 18, 1979	1051-1201
1	Pavonia	April 20, 1979	1119-1221
3	Pavonia	April 20, 1979	1420-1523

SITE 31-1 ROSEVILLE 03-FEB-78 0900-1000
RETARDERS-WS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	1.6	69.0	66.1	0.0
2	1.6	61.0	58.1	0.0
3	1.6	62.0	59.1	0.0
4	13.2	68.0	74.1	0.3
5	13.2	69.0	75.1	0.3
6	6.6	74.0	77.1	0.5
7	8.3	70.0	74.1	0.3
8	6.6	62.0	65.1	0.0
9	3.3	60.0	60.1	0.0
10	16.5	67.0	74.1	0.3
11	6.6	86.0	89.1	8.7
12	6.6	72.0	75.1	0.3
13	6.6	76.0	79.1	0.9
14	9.9	73.0	77.9	0.7
15	6.6	81.0	84.1	2.8
16	6.6	78.0	81.1	1.4
17	8.3	74.0	78.1	0.7
18	6.6	63.0	66.1	0.0
19	1.6	72.0	69.1	0.1
20	8.3	76.0	80.1	1.1
21	6.6	70.0	73.1	0.2
22	8.3	80.0	84.1	2.7
23	4.9	76.0	77.9	0.7
24	31.3	58.0	67.9	0.1
25	6.6	66.0	69.1	0.1
26	9.9	65.0	69.9	0.1
27	9.9	70.0	74.9	0.3
28	14.8	74.0	80.6	1.2
29	14.8	60.0	66.6	0.0
30	13.2	60.0	66.1	0.0
31	11.5	58.0	63.5	0.0
32	9.9	72.0	76.9	0.5
33	8.3	76.0	80.1	1.1
34	14.8	80.0	86.6	4.9
35	11.5	70.0	75.5	0.4
36	23.1	80.0	88.5	7.7
37	8.3	77.0	81.1	1.4
38	18.1	82.0	89.5	9.5
39	4.9	62.0	63.9	0.0
40	26.4	82.0	91.1	13.9
41	18.1	82.0	89.5	9.5
42	13.2	74.0	80.1	1.1
43	18.1	76.0	83.5	2.4
44	9.9	72.0	76.9	0.5
45	14.8	78.0	84.6	3.1
46	18.1	82.0	89.5	9.5
47	23.1	66.0	74.5	0.3
48	3.3	74.0	74.1	0.3
49	1.6	66.0	63.1	0.0
50	14.8	72.0	78.6	0.8
51	6.6	72.0	75.1	0.3
52	4.9	77.0	78.9	0.8
53	8.3	78.0	82.1	1.7
54	9.9	74.0	78.9	0.8
55	6.6	73.0	76.1	0.4
56	4.9	74.0	75.9	0.4
57	6.6	76.0	79.1	0.9
58	16.5	78.0	85.1	3.5
59	1.6	62.0	59.1	0.0
60	1.6	64.0	61.1	0.0
61	1.6	66.0	63.1	0.0
62	26.4	62.0	71.1	0.1
TOTAL	628.7		99.7	100.0

SITE 31-1 ROSEVILLE 03-FEB-78 0900-1000
TRAINS MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	3.3	54.0	59.2	0.3
2	21.4	62.0	75.3	12.8
3	21.4	61.0	74.3	10.2
4	49.5	63.0	79.9	37.2
5	16.5	56.0	68.2	2.5
6	29.7	64.0	78.7	28.1
7	8.3	60.0	69.2	3.1
8	24.8	58.0	71.9	5.9
TOTAL	174.9		84.2	100.0

SITE 31-1 ROSEVILLE 03 FEB-78 0900-1000
LOCO MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	16.5	57.0	63.2	****
TOTAL	16.5		63.2	100.0

SITE 31-1 ROSEVILLE 03-FEB-78 0900-1000
CAR IMPACTS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	1.6	70.0	69.2	7.6
2	8.3	66.0	72.2	15.1
3	8.3	68.0	74.2	24.0
4	11.5	70.0	77.6	53.1
5	1.6	54.0	53.2	0.2
TOTAL	31.3		80.4	100.0

SITE 31-1 ROSEVILLE 03-FEB-78 0900-1000
NON RR AIRCRAFT

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	51.1	68.0	82.1	****
TOTAL	51.1		82.1	100.0

SITE 31-1 ROSEVILLE 03-FEB-78 0900-1000
BACKGROUND

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	2697.1	54.0	88.3	****
TOTAL	2697.1		88.3	100.0

SOURCE	TIME	SEL	LEQ	PCT. ENERGY
LOCO MOVING	16.5	63.2	27.6	0.0
TRAINS MOVING	174.9	84.2	48.6	2.5
CAR IMPACTS	31.3	80.4	44.8	1.0
RETARDERS-WS	628.7	99.7	64.1	88.5
NON RR AIRCRAFT	51.5	82.1	46.5	1.5
BACKGROUND	2697.1	88.3	52.7	6.4
TOTAL	3600.0	100.2	64.7	100.0

STIE 32-1 RICHMOND 08-FEB-78
TRAIN MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	22.8	80.0	93.6	3.4
2	35.0	76.0	91.4	2.0
3	12.2	74.0	84.9	0.5
4	30.4	76.0	90.8	1.8
5	10.6	90.0	100.3	15.6
6	13.7	76.0	87.4	0.8
7	44.1	76.0	92.4	2.6
8	59.3	74.0	91.7	2.2
9	7.6	82.0	90.8	1.8
10	53.2	75.0	92.3	2.5
11	21.3	74.0	87.3	0.8
12	54.7	76.0	93.4	3.2
13	12.2	76.0	86.9	0.7
14	12.2	78.0	88.9	1.1
15	12.2	72.0	82.9	0.3
16	25.8	80.0	94.1	3.8
17	16.7	76.0	88.2	1.0
18	19.8	82.0	95.0	4.6
19	13.7	76.0	87.4	0.8
20	15.2	74.0	85.8	0.6
21	10.6	74.0	84.3	0.4
22	15.2	78.0	89.8	1.4
23	56.2	88.0	97.5	8.3
24	18.2	76.0	88.6	1.1
25	28.9	84.0	98.6	10.7
26	10.6	76.0	86.3	0.6
27	41.0	76.0	92.1	2.4
28	35.0	76.0	91.4	2.0
29	30.4	84.0	98.8	11.2
30	28.9	76.0	90.6	1.7
31	12.2	76.0	86.9	0.7
32	106.4	77.0	97.3	7.8
33	13.7	78.0	89.4	1.3
34	9.1	76.0	85.6	0.5
TOTAL	909.1		108.3	100.0

STIE 32-1 RICHMOND 08-FEB-78
CAR IMPACTS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	4.6	82.0	85.6	7.5
2	1.5	88.0	86.8	9.8
3	1.5	88.0	86.8	9.8
4	1.5	90.0	88.8	15.5
5	1.5	81.0	79.8	1.9
6	3.0	90.0	91.8	30.9
7	1.5	84.0	82.8	3.9
8	1.5	85.0	83.8	4.9
9	1.5	86.0	84.8	6.2
10	0.8	83.0	79.0	1.6
11	1.5	87.0	85.8	7.8
12	1.5	73.0	71.8	0.3
TOTAL	21.9		96.9	100.0

[illegible]
LOCO MOVING [illegible]

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	9.1	76.0	79.7	0.1
2	15.2	79.0	84.9	0.4
3	16.7	80.0	86.3	0.6
4	31.9	78.0	87.1	0.2
5	19.8	86.0	93.0	2.9
6	42.6	78.0	88.4	1.0
7	15.2	76.0	81.9	0.2
8	12.2	76.0	80.9	0.2
9	13.7	79.0	84.4	0.4
10	15.2	75.0	80.9	0.2
11	7.6	74.0	76.9	0.1
12	16.7	75.0	81.3	0.2
13	38.0	84.0	93.9	3.5
14	39.5	76.0	86.0	0.6
15	9.1	76.0	79.7	0.1
16	4.6	73.0	73.7	0.0
17	9.1	80.0	83.7	0.3
18	28.9	83.0	91.7	2.1
19	16.7	84.0	90.3	1.5
20	35.0	76.0	85.5	0.5
21	25.8	76.0	84.2	0.4
22	19.8	82.0	89.0	1.2
23	13.7	78.0	83.4	0.3
24	3.0	76.0	74.8	0.0
25	13.7	80.0	85.4	0.5
26	7.6	74.0	76.9	0.1
27	15.2	74.0	79.9	0.1
28	19.8	78.0	85.0	0.5
29	12.2	84.0	88.9	1.1
30	53.2	76.0	87.3	0.8
31	45.6	88.0	98.7	10.6
32	7.6	75.0	77.9	0.1
33	16.7	75.0	81.3	0.2
34	16.7	88.0	94.3	3.9
35	12.2	78.0	82.9	0.3
36	30.4	75.0	83.9	0.4
37	22.8	76.0	83.6	0.3
38	12.2	84.0	88.9	1.1
39	31.9	76.0	85.1	0.5
40	13.7	72.0	77.4	0.1
41	6.1	71.0	72.9	0.0
42	7.6	75.0	77.9	0.1
43	28.9	79.0	87.7	0.8
44	21.3	85.0	92.3	2.5
45	36.5	78.0	87.7	0.8
46	28.9	84.0	92.7	2.7
47	19.8	82.0	89.0	1.2
48	13.7	74.0	79.4	0.1
49	4.6	76.0	76.7	0.1
50	9.1	76.0	79.7	0.1
51	21.3	77.0	84.3	0.4
52	39.5	79.0	89.0	1.2
53	12.2	70.0	74.9	0.0
54	7.6	73.0	75.9	0.1
55	35.0	78.0	87.5	0.8
56	13.7	74.0	79.4	0.1
57	22.8	76.0	83.6	0.3
58	38.0	80.0	89.9	1.4
59	12.2	80.0	84.9	0.4
60	9.1	[illegible]	75.7	0.1
61	12.2	76.0	80.9	0.2
62	13.7	75.0	80.4	0.2
63	19.8	76.0	83.0	0.3
64	36.5	80.0	89.7	1.3
65	24.3	84.0	91.9	2.2
66	24.3	84.0	91.9	2.2
67	12.2	76.0	80.9	0.2
68	19.8	76.0	83.0	0.3
69	104.9	78.0	92.3	2.4
70	13.7	82.0	87.4	0.8
71	18.2	76.0	82.7	0.3
72	7.6	82.0	84.9	0.4
73	6.1	74.0	75.9	0.1
74	30.4	76.0	84.9	0.4
75	31.9	76.0	85.1	0.5
76	21.3	76.0	83.3	0.3
77	76.0	74.0	86.9	0.7
78	7.6	72.0	74.9	0.0
79	15.2	78.0	83.9	0.4
80	13.7	77.0	82.4	0.3
81	24.3	78.0	85.9	0.6
82	24.3	75.0	82.9	0.3
83	57.8	76.0	87.7	0.8
84	30.4	86.0	94.9	4.5
85	47.1	76.0	84.8	0.7
86	24.3	83.0	90.9	1.8
87	7.6	73.0	75.9	0.1
88	12.2	74.0	78.9	0.1
89	48.6	78.0	88.9	1.1
90	30.4	76.0	84.9	0.4
91	35.0	88.0	97.5	8.1
92	9.1	72.0	75.7	0.1
93	21.3	76.0	83.3	0.3
94	9.1	78.0	81.7	0.2
95	16.7	83.0	89.3	1.2
96	9.1	74.0	77.7	0.1
97	30.4	78.0	86.9	0.7
98	39.5	79.0	89.0	1.2
99	15.2	85.0	90.9	1.8
**	13.7	83.0	88.4	1.0
**	6.1	80.0	81.9	0.2
**	13.7	81.0	80.4	0.6
**	7.6	74.0	76.9	0.1
**	57.8	85.0	96.7	6.7
**	15.2	84.0	89.9	1.4
**	36.5	78.0	87.7	0.8
TOTAL	2330.9		100.4	100.0

SITE 32-1 RICHMOND 08-FEB-78
OTHER RR NOISES-AIR WHISTLES

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	7.6	80.0	85.8	80.1
2	3.0	78.0	79.8	19.9
TOTAL	10.6		86.8	100.0

SITE 32-1 RICHMOND 08-FEB-78
NON RR -MOTOR VEHICLES

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	7.6	82.0	87.8	28.9
2	10.6	84.0	91.2	63.8
3	12.2	74.0	81.9	7.3
TOTAL	30.4		93.2	100.0

SITE 32-1 RICHMOND 08-FEB-78 1600-1700
BACKGROUND

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	297.1	60.0	84.7	****
TOTAL	297.1		84.7	100.0

SITE 32-1 RICHMOND 08-FEB-78 16:00-17:00

SOURCE	TIME	SEL	LEQ	PCT. ENERGY
LOCO MOVING	2330.9	108.4	72.8	47.9
TRAINS MOVING	909.1	108.3	72.7	46.8
CAR IMPACTS	21.9	96.9	61.3	3.4
OTHER RR AIR REL	10.6	86.8	51.2	0.3
NON RR MOTOR VEH	30.4	93.2	57.6	1.4
BACKGROUND	297.1	84.7	49.1	0.2
TOTAL	3600.0	111.6	76.0	100.0

SITE 33-1 BARSTOW 18-FEB-78 0300-0400
LOCO MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	16.8	62.0	71.5	26.9
2	24.5	62.0	72.9	39.2
3	16.8	63.0	72.3	33.9
TOTAL	58.1		76.9	100.0

SITE 33-1 BARSTOW 18-FEB-78 0300-0400
CAR IMPACT

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	4.6	68.0	71.6	4.4
2	3.1	72.0	73.8	7.4
3	3.1	72.0	73.8	7.4
4	4.6	69.0	72.6	5.6
5	6.1	67.0	71.9	4.7
6	6.1	76.0	80.9	37.2
7	1.5	78.0	76.8	14.7
8	3.1	76.0	77.8	18.6
TOTAL	32.1		85.2	100.0

SITE 33-1 BARSTOW 18-FEB-78 0300-0400
OTHER RR NOISES-AIR RELEASE

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	10.7	69.0	76.3	****
TOTAL	10.7		76.3	100.0

OTHER NOISES - OTHER VEHICLES

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	6.1	59.0	63.9	1.8
2	10.7	58.0	65.3	2.6
3	10.7	60.0	67.3	4.1
4	18.4	66.0	75.6	27.7
5	10.7	58.0	65.3	2.6
6	18.4	68.0	77.6	43.9
7	10.7	60.0	67.3	4.1
8	16.8	58.0	67.3	4.0
9	15.3	62.0	70.8	9.2
TOTAL	117.8		81.2	100.0

SITE [illegible] BARSTOW 18-FEB-78 0300-0400

RETARDERS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	1.5	61.0	57.9	0.0
2	4.6	79.0	80.7	0.2
3	4.6	75.0	76.7	0.1
4	10.7	97.0	102.3	25.5
5	1.5	82.0	78.9	0.1
6	3.1	84.0	83.9	0.4
7	7.6	97.0	100.9	18.2
8	4.6	82.0	83.7	0.3
9	1.5	79.0	75.9	0.1
10	3.1	68.0	67.9	0.0
11	1.5	68.0	64.9	0.0
12	10.7	60.0	65.3	0.0
13	1.5	64.0	60.9	0.0
14	6.1	84.0	86.9	0.7
15	7.6	67.0	70.9	0.0
16	3.1	70.0	69.9	0.0
17	3.1	76.0	75.9	0.1
18	1.5	72.0	68.9	0.0
19	1.5	63.0	59.9	0.0
20	0.8	62.0	55.9	0.0
21	1.5	60.0	56.9	0.0
22	2.3	80.0	78.7	0.1
23	1.5	68.0	64.9	0.0
24	6.1	70.0	72.9	0.0
25	4.6	69.0	70.7	0.0
26	2.3	73.0	71.7	0.0
27	4.6	66.0	67.7	0.0
28	4.6	78.0	79.7	0.1
29	4.6	81.0	82.7	0.3
30	2.3	77.0	75.7	0.1
31	2.3	73.0	71.7	0.0
32	4.6	78.0	79.7	0.1
33	1.5	58.0	54.9	0.0
34	3.8	67.0	67.9	0.0
35	3.1	82.0	81.9	0.2
36	2.3	60.0	58.7	0.0
37	3.8	78.0	78.9	0.1
38	4.6	67.0	68.7	0.0
39	10.7	67.0	72.3	0.0
40	3.1	70.0	69.9	0.0
41	1.5	82.0	78.9	0.1
42	4.6	84.0	85.7	0.5
43	4.6	90.0	91.7	2.2
44	9.2	80.0	84.7	0.4
45	4.6	84.0	85.7	0.5
46	3.8	76.0	76.9	0.1
47	4.6	73.0	74.7	0.0
48	6.1	78.0	80.9	0.2
49	1.5	68.0	64.9	0.0
50	1.5	75.0	71.9	0.0
51	13.8	70.0	76.4	0.1
53	1.5	72.0	68.9	0.0
54	10.7	76.0	81.3	0.2
55	4.6	76.0	77.7	0.1
56	1.5	70.0	66.9	0.0
57	3.8	85.0	85.9	0.6
58	7.6	88.0	91.9	2.3
59	3.1	70.0	69.9	0.0
60	1.5	65.0	61.9	0.0
61	9.2	89.0	93.7	3.5
62	8.4	86.0	90.3	1.6
63	7.6	84.0	87.9	0.9
64	13.8	82.0	88.4	1.0
65	1.5	67.0	63.9	0.0
66	1.5	62.0	58.9	0.0
67	3.1	76.0	75.9	0.1
68	4.6	92.0	93.7	3.4
69	6.1	72.0	74.9	0.0
70	3.8	80.0	80.9	0.2
71	8.4	80.0	84.3	0.4
72	4.6	83.0	84.7	0.4
73	6.1	84.0	86.9	0.7
74	9.2	78.0	82.7	0.3
75	5.4	90.0	92.3	2.5
76	6.1	78.0	80.9	0.2
77	9.2	70.0	74.7	0.0
78	6.1	96.0	98.9	11.6
79	9.9	85.0	90.0	1.5
80	4.6	84.0	85.7	0.5
81	6.1	86.0	88.9	1.2
82	8.4	83.0	87.3	0.8
83	12.2	83.0	88.9	1.2
84	3.8	88.0	88.9	1.1
85	3.1	80.0	79.9	0.1
86	4.6	87.0	88.7	1.1
87	3.1	80.0	79.9	0.1
88	4.6	86.0	87.7	0.9
89	4.6	70.0	71.7	0.0
90	5.4	80.0	82.3	0.3
91	3.1	74.0	73.9	0.0
92	15.3	85.0	91.9	2.3
93	6.1	76.0	78.9	0.1
94	9.2	86.0	90.7	1.7
95	7.6	76.0	79.9	0.1
96	4.6	78.0	79.7	0.1
97	4.6	86.0	87.7	0.9
98	7.6	86.0	89.9	1.4
99	9.2	62.0	66.7	0.0
**	4.6	77.0	78.7	0.1
**	3.1	79.0	78.9	0.1
**	3.1	79.0	78.9	0.1
**	1.1	74.0	69.3	0.0
**	4.6	84.0	85.7	0.5
**	6.1	86.0	88.9	1.2
**	3.1	70.0	69.9	0.0
**	4.6	74.0	75.7	0.1
**	1.5	66.0	62.9	0.0
**	1.5	66.0	62.9	0.0
**	1.5	64.0	60.9	0.0
TOTAL	538.2		108.3	100.0

WYLE LABORATORIES

SITE 33-1 BARSTOW 18-FEB-78 0300-0400
MISC. RR NOISES

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	1.5	62.0	60.8	11.2
2	1.5	64.0	62.8	17.8
3	1.5	61.0	59.8	8.9
4	1.5	67.0	65.8	35.4
5	1.5	64.0	62.8	17.8
6	1.5	61.0	59.8	8.9
TOTAL	9.2		70.3	100.0

SITE 33-1 BARSTOW 18-FEB-79 0300-0400
BACKGROUND

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	2833.9	50.0	84.5	****
TOTAL	2833.9		84.5	100.0

SITE 33-1 BARSTOW 18-FEB-78 03:00-04:00

SOURCE	TIME	SEL	LEQ	PCT. ENERGY
LOCO MOVING	58.1	76.9	41.3	0.1
CAR IMPACTS	32.1	85.2	49.6	0.5
RETARDERS-WS	538.2	108.3	72.7	98.8
OTHER RR-AIR REL	10.7	76.3	40.7	0.1
NON RR MOTOR VEH	117.8	81.2	45.6	0.2
MISC.	9.2	70.3	34.7	0.0
BACKGROUND	2833.9	84.5	48.9	0.4
TOTAL	3600.0	108.4	72.8	100.0

SITE 33-3 BARSTOW 17-FEB-78 22:00-23:00
LOCO IDLING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	221.8	66.0	89.5	5.9
2	283.0	62.0	86.5	3.0
3	198.9	64.0	87.0	3.4
4	76.5	68.0	86.8	3.2
5	229.5	66.0	89.6	6.1
6	45.9	62.0	78.6	0.5
7	128.5	66.0	87.1	3.4
8	29.1	64.0	78.6	0.5
9	24.5	66.0	79.9	0.7
10	27.5	64.0	78.4	0.5
11	55.1	64.0	81.4	0.9
12	67.3	66.0	84.3	1.8
13	114.8	68.0	88.6	4.9
14	91.8	64.0	83.6	1.6
15	53.5	62.0	79.3	0.6
16	140.8	76.0	97.5	37.7
17	134.6	66.0	87.3	3.6
18	88.7	66.0	85.5	2.4
19	166.8	64.0	86.2	2.8
20	73.4	64.0	82.7	1.2
21	131.6	64.0	85.2	2.2
22	61.2	64.0	81.9	1.0
23	111.7	64.0	84.5	1.9
24	163.7	64.0	86.1	2.8
25	214.2	64.0	87.3	3.6
26	58.1	64.0	81.6	1.0
27	160.6	64.0	86.1	2.7
TOTAL	3153.2		101.7	100.0

SITE 33-3 BARSTOW 17-FEB-78 22:00-23:00
LOCO MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	53.5	78.0	89.4	42.5
2	67.3	72.0	84.3	15.0
3	15.3	78.0	83.9	13.6
4	107.1	72.0	86.4	23.9
TOTAL	243.3		92.6	100.0

SITE 33-3 BARSTOW 17-FEB-78 22:00-23:00
OTHER RR WHISTLE AIR RELEASE

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	1.5	70.0	68.8	0.2
2	1.5	68.0	66.8	0.1
3	1.5	70.0	68.8	0.2
4	1.5	72.0	70.8	0.3
5	1.5	72.0	70.8	0.3
6	1.5	70.0	68.8	0.2
7	1.5	72.0	70.8	0.3
8	1.5	72.0	70.8	0.3
9	1.5	76.0	74.8	0.9
10	1.5	68.0	66.8	0.1
11	1.5	82.0	80.8	3.4
12	1.5	72.0	70.8	0.3
13	1.5	76.0	74.8	0.9
14	3.1	76.0	77.8	1.7
15	3.1	74.0	75.8	1.1
16	3.1	76.0	77.8	1.7
17	3.1	88.0	89.8	27.4
18	1.5	92.0	90.8	34.4
19	3.1	76.0	77.8	1.7
20	3.1	80.0	81.8	4.3
21	1.5	82.0	80.8	3.4
22	1.5	86.0	84.8	8.6
23	1.5	84.0	82.8	5.5
24	1.5	80.0	78.8	2.2
TOTAL	45.9		95.5	100.0

SITE 33-3 BARSTOW 17-FEB-78 22:00-23:00
MISC.

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	30.6	72.0	86.9	24.6
2	33.7	72.0	87.3	27.1
3	27.5	74.0	88.4	35.1
4	9.2	72.0	81.6	7.4
5	4.6	74.0	80.6	5.8
TOTAL	105.6		92.9	100.0

SITE 33-3 BARSTOW 17-FEB-78 22:00-23:00
NON RR MOTOR VEHICLES

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	3.1	70.0	71.8	2.3
2	4.6	70.0	73.6	3.4
3	3.1	74.0	75.8	5.8
4	3.1	70.0	71.8	2.3
5	4.6	68.0	71.6	2.2
6	12.2	72.0	79.9	14.5
7	3.1	76.0	77.8	9.1
8	3.1	76.0	77.8	9.1
9	3.1	78.0	79.8	14.5
10	3.1	80.0	81.8	23.0
11	3.1	74.0	75.8	5.8
12	4.6	70.0	73.6	3.4
13	1.5	76.0	74.8	4.6
TOTAL	52.0		88.2	100.0

SITE 33-3 BARSTOW 17-FEB-78 22:00-23:00

SOURCE	TIME	SEL	LEQ	PCT. ENERGY
LOCO IDLING	3153.2	101.7	66.1	65.0
LOCO MOVING	243.3	92.6	57.0	8.0
OTHER RR	45.9	95.5	59.9	15.6
NON RR MOTOR VEH	52.0	88.2	52.6	2.9
MISC.	105.6	92.9	57.3	8.6
TOTAL	3600.0	103.6	68.0	100.0

SITE 41-1 BROSNAN 02-FEB-78 1200-1257
LOCO IDLING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	12.5	60.0	71.0	2.2
2	72.0	68.0	86.6	80.6
3	153.4	58.0	79.9	17.2
TOTAL	237.9		87.5	100.0

SITE 41-1 BROSNAN 02-FEB-78 12:00-12:57
LOCO MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	68.9	60.0	72.4	3.0
2	12.5	58.0	63.0	0.3
3	78.3	60.0	73.0	3.4
4	109.5	58.0	72.5	3.0
5	18.8	58.0	64.8	0.5
6	75.1	60.0	72.8	3.2
7	62.6	58.0	70.0	1.7
8	21.9	58.0	65.5	0.6
9	50.1	66.0	77.1	8.6
10	39.1	66.0	76.0	6.7
11	28.2	60.0	68.6	1.2
12	181.5	68.0	84.7	49.4
13	169.0	64.0	80.3	18.3
TOTAL	915.5		87.7	100.0

SITE 41-1 BROSNAN 02-FEB-78 12:00-12:57
TRAINS MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	175.3	64.0	86.4	53.7
2	81.4	62.0	81.1	15.7
3	200.3	56.0	79.0	9.7
4	59.5	58.0	75.7	4.6
5	84.5	62.0	81.3	16.3
TOTAL	601.0		89.1	100.0

SITE 41-1 BROSNAN 02-FEB-78 1200-1257
CAR ROLLING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	64.9	60.0	69.6	****
TOTAL	64.9		69.6	100.0

CAR IMPACTS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	1.6	61.0	59.9	0.2
2	1.6	60.0	58.9	0.2
3	1.6	66.0	64.9	0.7
4	1.6	62.0	60.9	0.3
5	1.6	68.0	66.9	1.1
6	1.6	78.0	76.9	11.4
7	1.6	78.0	76.9	11.4
8	1.6	79.0	77.9	14.3
9	1.6	70.0	68.9	1.8
10	1.6	68.0	66.9	1.1
11	1.6	66.0	64.9	0.7
12	1.6	68.0	66.9	1.1
13	1.6	66.0	64.9	0.7
14	1.6	68.0	66.9	1.1
15	3.1	78.0	79.9	22.8
16	3.1	78.0	79.9	22.8
17	1.6	66.0	64.9	0.7
18	1.6	65.0	63.9	0.6
19	1.6	62.0	60.9	0.3
20	1.6	65.0	63.9	0.6
21	1.6	66.0	64.9	0.7
22	1.6	62.0	60.9	0.3
23	1.6	64.0	62.9	0.5
24	1.6	74.0	72.9	4.5
TOTAL	40.7		86.4	100.0

SITE 41-1 BROSNAN 02-FEB-78 12:00-12:57
RETARDERS-WS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	62.6	64.0	76.9	17.5
2	78.3	62.0	75.8	13.8
3	15.6	64.0	70.9	4.4
4	28.2	58.0	67.4	2.0
5	54.8	60.0	72.3	6.1
6	51.6	60.0	72.0	5.7
7	181.5	64.0	81.5	50.6
TOTAL	472.6		84.5	100.0

SITE 41-1 BROSNAN 02-FEB-78 12:00-12:57
OTHER RR NOISES-AIR REL WHIST, BELL

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	31.3	70.0	81.9	24.6
2	20.3	68.0	78.1	10.1
3	12.5	73.0	81.0	19.6
4	15.5	60.0	68.9	1.2
5	4.7	62.0	65.7	0.6
6	4.7	68.0	71.7	2.3
7	6.3	64.0	69.0	1.2
8	1.6	72.0	70.9	1.9
9	7.8	64.0	69.9	1.5
10	4.7	80.0	83.7	36.9
TOTAL	109.4		88.0	100.0

SITE 41-1 BROSNAN 02-FEB-78 1200-1257
NON RR AIRCRAFT P/A

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	46.9	60.0	73.7	61.3
2	4.7	68.0	71.7	38.7
TOTAL	51.6		75.8	100.0

SITE 41-1 BROSNAN 02-FEB-78 1200-1257
MISC.

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	12.5	58.0	69.0	10.5
2	18.8	58.0	70.7	15.8
3	46.9	58.0	74.7	39.5
4	64.2	56.0	74.1	34.1
TOTAL	142.4		78.7	100.0

SITE 41-1 BROSNAN 02-FEB-78 1200-1257
BACKGROUND

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	771.0	52.0	80.9	****
TOTAL	771.0		80.9	100.0

SITE 41-1 BROSNAN 02-FEB-78 1200-1257

SOURCE	TIME	SEL	LEQ	PCT. ENERGY
LOCO IDLING	237.9	87.5	52.2	15.8
LOCO MOVING	915.5	87.7	52.4	16.6
TRAINS MOVING	601.0	89.1	53.8	22.8
CAR IMPACTS	40.7	86.4	51.1	12.3
RETARDERS-WS	472.6	84.5	49.2	7.9
OTHER RR AIR REL	109.4	88.0	52.7	17.7
NON RR AIRCRAFT	51.6	75.8	40.5	1.1
CAR ROLLING	64.9	69.6	34.3	0.3
MISC.	142.4	78.7	43.4	2.1
BBACKGROUND	771.0	80.9	45.6	3.5
TOTAL	3407.0	95.5	60.2	100.0

SITE 41-1 BROSNAN 02-FEB-78 1300
LOCO MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	28.0	65.0	73.5	9.1
2	24.3	66.0	73.9	9.9
3	18.7	61.0	67.8	2.4
4	28.0	64.0	72.5	7.2
5	9.3	62.0	65.8	1.5
6	4.7	63.0	63.8	1.0
7	18.7	65.0	71.8	6.1
8	15.0	64.0	69.8	3.9
9	15.0	70.0	75.8	15.4
10	15.0	70.0	75.8	15.4
11	13.1	68.0	73.2	8.5
12	22.4	66.0	73.6	9.1
13	26.2	66.0	74.2	10.7
TOTAL	238.4		84.0	100.0

SITE 41-1 BROSNAN 02-FEB-78 1300
CAR IMPACT

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	0.9	64.0	60.5	****
TOTAL	0.9		60.5	100.0

WYLE LABORATORIES

SITE 41-1 BROSNAN 02-FEB-78 1300
RETARDERS AND WHEEL SQUEELS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	1.8	64.0	61.5	0.2
2	2.8	87.0	86.4	75.0
3	4.7	69.0	70.6	2.0
4	3.7	68.0	68.6	1.2
5	9.3	67.0	71.6	2.5
6	1.9	70.0	67.6	1.0
7	5.6	77.0	79.4	15.0
8	1.9	74.0	71.6	2.5
9	2.8	65.0	64.4	0.5
TOTAL	34.5		87.6	100.0

SITE 41-1 BROSNAN 02-FEB-78 1300
MISC. RR NOISES LS BELL WHISTLE

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	3.7	68.0	70.7	6.4
2	3.7	57.0	59.7	0.5
3	15.0	28.0	36.8	0.0
4	9.4	67.0	73.7	12.8
5	3.7	79.0	81.7	80.1
6	0.9	60.0	56.5	0.2
TOTAL	36.4		82.6	100.0

SITE 41-1 BROSNAN 02-FEB-78 13:-14:00
BACKGROUND

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	2679.4	54.0	88.3	****
TOTAL	2679.4		88.3	100.0

SITE 41-1 BROSNAN 02-FEB-78 1300
MISC.

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	37.4	78.0	93.7	2.1
2	9.3	65.0	74.7	0.0
3	16.8	64.0	76.3	0.0
4	31.8	62.0	77.0	0.0
5	9.4	64.0	73.7	0.0
6	33.7	62.0	77.3	0.0
7	2.8	82.0	86.5	0.4
8	5.6	95.0	102.5	15.7
9	7.5	80.0	88.8	0.7
10	63.6	68.0	86.0	0.4
11	87.9	90.0	109.4	78.1
12	16.8	58.0	70.3	0.0
13	18.7	60.0	72.7	0.0
14	16.8	58.0	70.3	0.0
15	48.6	60.0	76.9	0.0
16	24.3	60.0	73.9	0.0
17	22.4	62.0	75.5	0.0
18	41.1	68.0	84.1	0.2
19	22.4	62.0	75.5	0.0
20	18.7	60.0	72.7	0.0
21	13.1	61.0	72.2	0.0
22	16.8	60.0	72.3	0.0
23	3.7	64.0	69.7	0.0
24	5.6	68.0	75.5	0.0
25	7.5	66.0	74.8	0.0
26	4.7	83.0	89.7	0.8
27	2.8	76.0	80.5	0.1
28	1.9	74.0	76.7	0.0
29	1.9	78.0	80.7	0.1
30	1.9	77.0	79.7	0.1
31	5.6	80.0	87.5	0.5
32	2.8	75.0	79.5	0.1
33	1.9	74.0	76.7	0.0
34	2.8	78.0	82.5	0.2
35	1.9	70.0	72.7	0.0
TOTAL	610.4		110.5	100.0

SITE 41-1 BROSAN 02-FEB-78 13:00-14:00

SOURCE	TIME	SEL	LEQ	PCT. ENERGY
LOCO MOVING	238.4	84.0	48.4	0.2
CAR IMPACTS	0.9	60.5	24.9	0.0
RETARDERS-WS	34.5	87.6	52.0	0.5
OTHER RR-WHISTLE	36.4	82.6	47.0	0.2
MISC.*	610.4	110.5	74.9	98.5
BACKGROUND	2679.4	88.3	52.7	0.6
TOTAL	3600.0	110.6	75.0	100.0

WYLE LABORATORIES

SITE 42-1 MAYS 09-FEB-78 2200-2300
OTHER RR NOISES-WHISTLES BELLS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	3.1	80.0	81.9	3.9
2	10.9	76.0	83.4	5.5
3	3.1	56.0	57.9	0.0
4	4.7	56.0	59.7	0.0
5	12.5	72.0	80.0	2.5
6	4.7	62.0	65.7	0.1
7	25.0	66.0	77.0	1.3
8	18.7	58.0	67.7	0.1
9	4.7	84.0	87.7	14.8
10	14.0	70.0	78.5	1.8
11	3.1	78.0	79.9	2.5
12	4.7	78.0	81.7	3.7
13	4.7	78.0	81.7	3.7
14	10.9	72.0	79.4	2.2
15	23.4	54.0	64.7	0.1
16	23.4	80.0	90.7	29.5
17	45.2	76.0	89.5	22.7
18	45.2	70.0	83.5	5.7
TOTAL	262.1		96.0	100.0

SITE 42-1 MAYS 09-FEB-78 22:00-23:00
LOCO MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	25.0	62.0	70.0	****
TOTAL	25.0		70.0	100.0

SITE 42-1 MAYS 09-FEB-78 2200-2300
MISC. RR NOISES

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	14.0	56.0	67.5	0.6
2	28.1	60.0	74.5	3.1
3	3.1	80.0	84.9	34.4
4	4.7	80.0	86.7	51.6
5	9.4	54.0	63.7	0.3
6	10.0	54.0	64.0	0.3
7	28.1	56.0	70.5	1.2
8	9.4	54.0	63.7	0.3
9	1.6	54.0	55.9	0.0
10	35.9	60.0	75.5	4.0
11	21.8	60.0	73.4	2.4
12	17.2	60.0	72.3	1.9
TOTAL	183.2		89.6	100.0

SITE 42-1 MAYS 09-FEB-78/2200-2300
TRAINS MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	4.7	72.0	78.7	****
TOTAL	4.7		78.7	100.0

SITE 42-1 MAYS 09-FEB-78/2200-2300
NON RR NOISES AIRCRAFT MOTOR VEHICLES

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	56.2	88.0	94.5	75.2
2	7.8	56.0	61.9	0.0
3	7.8	56.0	61.9	0.0
4	60.8	74.0	88.8	20.5
5	9.4	60.0	66.7	0.1
6	7.8	56.0	61.9	0.0
7	6.2	54.0	58.9	0.0
8	29.6	66.0	77.7	1.6
9	9.4	72.0	78.7	2.0
10	10.9	58.0	65.4	0.1
11	25.0	60.0	71.0	0.3
12	7.8	60.0	65.9	0.1
13	4.7	54.0	57.7	0.0
TOTAL	243.4		95.7	100.0

SITE 42-1 MAYS 09-FEB-78 22:00-23:00
BACKGROUND

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	2881.6	50.0	84.6	****
TOTAL	2881.6		84.6	100.0

SITE 42-1 MAYS 09-FEB-78 22:00-23:00

SOURCE	TIME	SEL	LEQ	PCT. ENERGY
LOCO MOVING	25.0	70.0	34.4	0.1
TRAINS MOVING	4.7	78.7	43.1	0.8
NON RR AIRCRAFT	243.4	95.7	60.1	41.4
OTHER RR BELLS	262.1	96.0	60.4	44.3
MISC.	183.2	89.6	54.0	10.2
BACKGROUND	2881.6	84.6	49.0	3.2
TOTAL	3600.0	99.5	64.0	100.0

WYLE LABORATORIES

SITE 43-1 SETTEGAST 17-FEB-78 1100
LOCO MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	53.2	68.0	79.3	20.6
2	30.4	70.0	78.9	18.6
3	31.9	70.0	79.1	19.6
4	10.6	70.0	74.3	6.5
5	30.4	72.0	80.9	29.5
6	21.3	66.0	73.3	5.2
TOTAL	177.8		86.2	100.0

SITE 43-1 SETTEGAST 17-FEB-78 1100-1200
TRAIN MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	3.0	68.0	72.8	2.5
2	12.2	70.0	80.9	15.9
3	22.8	68.0	81.6	18.8
4	31.9	70.0	85.0	41.6
5	10.2	68.0	80.6	15.0
6	7.6	68.0	76.8	6.3
TOTAL	95.7		88.8	100.0

SITE 43-1 SETTEGAST 17-FEB-78 1100-1200
CAR IMPACTS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	12.2	72.0	79.9	6.0
2	9.1	68.0	74.6	1.8
3	3.0	83.0	84.8	18.5
4	7.6	78.0	83.8	14.8
5	1.5	83.0	81.8	9.3
6	3.0	83.0	84.8	18.5
7	7.6	76.0	81.8	9.4
8	3.0	74.0	75.8	2.3
9	3.0	68.0	69.8	0.6
10	16.7	68.0	77.2	3.3
11	4.6	74.0	77.6	3.6
12	22.8	72.0	82.6	11.2
13	1.5	72.0	70.8	0.7
TOTAL	95.6		92.1	100.0

SITE 43-1 SETTEGANT 17-FEB-78 1100-1200
BACKGROUND

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	2417.9	62.0	95.8	****
TOTAL	2417.9		95.8	100.0

SITE 43-1 SETTEGANT 17-FEB-78 1100
RETARDER-WS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	28.9	72.0	81.5	96.0
2	3.0	68.0	67.7	4.0
TOTAL	31.9		81.7	100.0

SITE 43-1 SETTEGANT 17-FEB-78 1100-1200
OTHER RR BELL

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	16.7	80.0	89.2	47.5
2	31.9	72.0	84.0	14.4
3	1.5	82.0	80.8	6.8
4	4.6	82.0	85.6	20.7
5	1.5	68.0	66.8	0.3
6	4.6	77.0	80.6	6.6
7	9.1	68.0	74.6	1.6
8	3.0	74.0	75.8	2.1
TOTAL	72.9		92.4	100.0

SITE 43-1 SETTEGAST 17-FEB-78 1100-1200
MISC. RR

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	27.4	92.0	106.4	50.0
2	7.6	90.0	98.8	8.7
3	19.8	70.0	83.0	0.2
4	4.6	75.0	81.6	0.2
5	12.2	86.0	96.9	5.6
6	24.3	74.0	87.9	0.7
7	1.5	72.0	73.8	0.0
8	15.2	70.0	81.8	0.2
9	10.6	86.0	96.3	4.9
10	22.8	74.0	87.6	0.7
11	19.8	76.0	89.0	0.9
12	77.5	74.0	92.9	2.2
13	19.8	74.0	87.0	0.6
14	16.7	70.0	82.2	0.2
15	30.0	72.0	86.8	0.5
16	13.7	78.0	89.4	1.0
17	19.8	83.0	96.0	4.5
18	142.9	76.0	97.6	6.5
19	30.4	72.0	86.8	0.6
20	21.3	74.0	87.3	0.6
21	24.3	80.0	93.9	2.8
22	19.8	70.0	83.0	0.2
23	22.8	70.0	83.6	0.3
24	44.1	81.0	97.4	6.4
25	38.0	75.0	90.8	1.4
26	21.3	66.0	79.3	0.1
TOTAL	708.2		109.4	100.0

SITE 43-1 SETTEGAST 17-FEB-78 11:00-12:00

SOURCE	TIME	SEL	LEQ	PCT. ENERGY
LOCO MOVING	177.8	86.2	50.6	0.4
TRAINS MOVING	95.7	88.8	53.2	0.8
CAR IMPACTS	95.6	92.1	56.5	1.7
RETARDERS-WS	31.9	81.7	46.1	0.2
OTHER RR-BELLS	72.9	92.4	56.8	1.8
MISC.	708.2	109.4	73.8	91.1
BACKGROUND	2417.9	95.8	60.2	4.0
TOTAL	3600.0	109.8	74.2	100.0

SITE SI-1 DILLARD 03-FEB-78 1500-1555
CAR IMPACTS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	1.7	78.0	77.2	0.8
2	1.7	74.0	73.2	0.3
3	3.3	84.0	86.2	6.5
4	1.7	74.0	73.2	0.3
5	1.7	70.0	69.2	0.1
6	1.7	70.0	69.2	0.1
7	3.3	88.0	90.2	16.3
8	3.3	76.0	78.2	1.0
9	1.7	76.0	75.2	0.5
10	1.7	76.0	75.2	0.5
11	1.7	74.0	73.2	0.3
12	1.7	76.0	75.2	0.5
13	3.3	74.0	76.2	0.7
14	3.3	84.0	86.2	6.5
15	1.7	76.0	75.2	0.5
16	1.7	78.0	77.2	0.8
17	3.3	74.0	76.2	0.7
18	1.7	76.0	75.2	0.5
19	1.7	74.0	73.2	0.3
20	1.7	80.0	79.2	1.3
21	1.7	72.0	71.2	0.2
22	1.7	74.0	73.2	0.3
23	1.7	76.0	75.2	0.5
24	1.7	74.0	73.2	0.3
25	3.3	82.0	84.2	4.1
26	1.7	76.0	75.2	0.5
27	1.7	76.0	75.2	0.5
28	3.3	90.0	92.2	25.9
29	8.3	76.0	82.2	2.6
30	8.3	74.0	80.2	1.6
31	3.3	80.0	82.2	2.6
32	1.7	80.0	79.2	1.3
33	1.7	76.0	75.2	0.5
34	1.7	72.0	71.2	0.2
35	1.7	72.0	71.2	0.2
36	1.7	74.0	73.2	0.3
37	1.7	72.0	71.2	0.2
38	1.7	74.0	73.2	0.3
39	1.7	72.0	71.2	0.2
40	1.7	82.0	81.2	2.1
41	1.7	72.0	71.2	0.2
42	1.7	84.0	83.2	3.3
43	1.7	88.0	87.2	8.2
44	1.7	86.0	85.2	5.2
TOTAL	101.3		98.1	100.0

SITE SI-1 HILLARD 03-FEB-78 1500-1555
RETARDERS-WS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	1.7	78.0	75.1	3.7
2	1.7	80.0	77.1	5.8
3	3.3	82.0	82.1	18.3
4	1.7	84.0	81.1	14.5
5	1.7	88.0	85.1	36.5
6	1.7	80.0	77.1	5.8
7	13.3	74.0	80.1	11.6
8	1.7	76.0	73.1	2.3
9	1.7	74.0	71.1	1.5
TOTAL	28.2		89.5	100.0

SITE SI-1 HILLARD 03-FEB-78 1500-1555
LOCO MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	19.9	72.0	79.1	1.4
2	38.2	70.0	79.9	1.7
3	36.5	76.0	85.7	6.5
4	56.4	74.0	85.6	6.3
5	36.5	76.0	85.7	6.5
6	46.5	78.0	88.7	13.1
7	76.4	78.0	90.9	21.5
8	81.3	78.0	91.2	22.9
9	71.4	78.0	90.6	20.1
TOTAL	463.1		97.6	100.0

SITE S1-1 DILLARD 03-FEB-78 1500-1555
TRAINS MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	20.2	82.0	96.5	7.0
2	19.9	84.0	97.0	7.8
3	16.6	88.0	100.2	16.4
4	14.9	84.0	95.7	5.9
5	19.9	78.0	91.0	2.0
6	44.8	84.0	100.5	17.6
7	76.4	74.0	92.8	3.0
8	51.5	78.0	95.1	5.1
9	245.7	74.0	97.9	9.7
10	182.6	66.0	88.6	1.1
11	56.4	68.0	85.5	0.6
12	79.7	74.0	93.0	3.1
13	69.7	66.0	84.4	0.4
14	112.9	70.0	90.5	1.8
15	117.9	80.0	100.7	18.5
TOTAL	1137.1		108.1	100.0

SITE S1-1 DILLARD 03-FEB-78 1500-1555
LOCO IDLING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	102.9	74.0	94.1	76.6
2	49.8	72.0	89.0	23.4
TOTAL	152.7		95.3	100.0

SITE 51-1 DILLARD 03-FEB-78 1500-1555
NON RR AIRCRAFT

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	56.4	90.0	104.5	****
TOTAL	56.4		104.5	100.0

SITE 51-1 DILLARD 03-FEB-78 1500-1555
OTHER RR WHISTLE

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	1.7	72.0	71.2	3.0
2	3.3	76.0	78.2	14.9
3	5.0	78.0	82.0	35.3
4	1.7	84.0	83.2	46.9
TOTAL	11.6		86.5	100.0

SITE 51-1 DILLARD 03-FEB-78 1500-1555
MISC.

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	96.3	76.0	95.8	****
TOTAL	96.3		95.8	100.0

SITE 51-1 DILLARD 03-FEB-78 1500-1555
BACKGROUND

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	1253.2	66.0	97.0	****
TOTAL	1253.2		97.0	100.0

SITE 51-1 DILLARD 03-FEB-78 1500-1555

SOURCE	TIME	SEL	LEQ	PCT. ENERGY
LOCO IDLING	152.7	95.3	60.1	2.9
LOCO MOVING	463.1	97.6	62.4	4.9
TRAIN MOVING	1137.1	108.1	72.9	54.5
CAR IMPACTS	101.3	98.1	62.9	5.4
RETARDERS-WS	28.2	89.5	54.3	0.8
NON RR AIRCRAFT	56.4	104.5	69.3	23.8
OTHER RR WHISTLE	11.6	86.5	51.3	0.4
MISC.	96.3	95.8	60.6	3.2
BACKGROUND	1253.2	97.0	61.8	4.2
TOTAL	3299.9	110.7	75.6	100.0

SITE S2-1 JOHNSTON 16-FEB-78 1800-1900
LOCO IDLING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	24.8	90.0	103.9	98.9
2	115.0	62.0	82.6	0.7
3	30.1	65.0	79.8	0.4
TOTAL	169.9		104.0	100.0

SITE S2-1 JOHNSTON 16-FEB-78 1800-1900
TRAIN MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	21.2	90.0	97.3	12.9
2	26.6	78.0	86.3	1.0
3	19.5	88.0	95.0	7.5
4	7.1	88.0	90.6	2.7
5	35.4	70.0	79.6	0.2
6	26.6	84.0	92.3	4.1
7	132.8	60.0	75.3	0.1
8	37.2	62.0	71.8	0.0
9	35.4	70.0	79.6	0.2
10	35.4	76.0	85.6	0.9
11	20.3	80.0	88.6	1.7
12	14.6	76.0	81.7	0.4
13	14.6	78.0	83.7	0.6
14	47.8	70.0	80.9	0.3
15	63.7	84.0	96.1	9.7
16	12.4	76.0	81.0	0.3
17	49.6	86.0	97.0	12.0
18	74.3	76.0	88.8	1.8
19	39.0	82.0	92.0	3.8
20	60.2	80.0	91.9	3.7
21	46.0	80.0	90.7	2.8
22	49.6	78.0	89.0	1.9
23	51.3	80.0	91.2	3.1
24	47.8	80.0	90.9	2.9
25	31.9	80.0	89.1	1.9
26	40.7	80.0	90.2	2.5
27	40.7	80.0	90.2	2.5
28	37.2	82.0	91.8	3.6
29	42.5	78.0	88.3	1.6
30	35.4	88.0	97.6	13.6
TOTAL	1204.8		106.2	100.0

SITE 52-1 JOHNSTON 16-FEB-78 1800-1900
LOCO MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	63.7	90.0	102.1	20.8
2	19.5	88.0	95.0	4.0
3	8.8	90.0	93.5	2.9
4	40.7	90.0	100.2	13.3
5	53.1	60.0	71.3	0.0
6	42.5	82.0	92.3	2.2
7	28.3	90.0	98.6	9.2
8	21.2	90.0	97.3	6.9
9	23.0	86.0	93.7	3.0
10	47.8	92.0	102.9	24.7
11	21.2	88.0	95.3	4.4
12	42.5	88.0	98.3	8.7
TOTAL	412.3		108.9	100.0

SITE 52-1 JOHNSTON 16-FEB-78 1800-1900
CAR IMPACTS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	1.8	94.0	93.5	2.2
2	1.8	78.0	77.5	0.1
3	3.5	80.0	82.4	0.2
4	3.5	90.0	92.4	1.7
5	3.5	80.0	82.4	0.2
6	8.8	92.0	98.4	7.0
7	1.8	99.0	98.5	7.0
8	3.5	78.0	80.4	0.1
9	5.3	84.0	88.2	0.7
10	5.3	70.0	74.2	0.0
11	3.5	94.0	96.4	4.4
12	7.1	96.0	101.5	14 ·
13	5.3	78.0	82.2	0.2
14	3.5	83.0	85.4	0.3
15	5.3	96.0	100.2	10.5
16	3.5	96.0	98.4	6.9
17	3.5	96.0	98.4	6.9
18	3.5	92.0	94.4	2.8
19	3.5	90.0	92.4	1.7
20	7.1	88.0	93.5	2.2
21	5.3	97.0	101.2	13.2
22	7.1	90.0	95.5	3.5
23	3.5	90.0	92.4	1.7
24	3.5	93.0	95.4	3.5
25	5.3	89.0	93.2	2.1
26	5.3	94.0	98.2	6.6
TOTAL	114.5		110.0	100.0

WYLE LABORATORIES

SITE 52-1 JOHNSTON 16-FEB-78 1800-1900
THRU TRAINS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	100.9	84.0	104.0	****
TOTAL	100.9		104.0	100.0

SITE 52-1 JOHNSTON 16-FEB-78 1800-1900
RETARDERS -WS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	3.5	84.0	84.4	0.2
2	7.1	90.0	93.4	1.5
3	8.8	91.0	95.4	2.3
4	14.6	98.0	104.6	18.9
5	12.4	90.0	95.8	2.5
6	35.4	100.0	110.4	72.8
7	5.3	91.0	93.2	1.4
8	5.3	82.0	84.2	0.2
9	5.3	84.0	86.2	0.3
TOTAL	97.7		111.8	100.0

[illegible] SIREN

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	30.1	92.0	103.8	9.9
2	8.8	72.0	78.4	0.0
3	19.5	72.0	81.9	0.1
4	17.7	88.0	97.5	2.3
5	60.2	87.0	101.8	6.3
6	88.5	76.0	92.5	0.7
7	85.0	80.0	96.3	1.8
8	17.7	87.0	96.5	1.8
9	5.3	90.0	94.2	1.1
10	17.7	92.0	101.5	5.8
11	53.1	76.0	90.2	0.4
12	14.6	88.0	96.6	1.9
13	7.1	76.0	81.5	0.1
14	7.1	86.0	91.5	0.6
15	7.1	75.0	80.5	0.0
16	30.1	62.0	73.8	0.0
17	14.6	88.0	96.6	1.9
18	76.1	80.0	95.8	1.6
19	28.3	89.0	100.5	4.7
20	5.3	100.0	104.2	11.0
21	8.8	100.0	106.4	18.3
22	12.4	100.0	107.9	25.8
23	76.1	82.0	97.8	2.5
24	42.5	82.0	95.3	1.4
TOTAL	733.7		113.8	100.0

SITE 52-1 JOHNSTON 16-FEB-78 1800-1900
OTHER RR NOISES AIR REL LS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	10.6	86.0	93.2	24.7
2	5.3	86.0	90.2	12.3
3	3.5	80.0	82.4	2.0
4	5.3	75.0	79.2	1.0
5	5.3	66.0	70.2	0.1
6	1.8	85.0	84.5	3.3
7	3.5	94.0	96.4	51.4
8	3.5	84.0	86.4	5.1
TOTAL	30.8		99.3	100.0

SITE 52-1 JOHNSTON 16-FEB-78 1800-1900
MISC.

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	12.4	88.0	98.9	26.8
2	5.3	90.0	97.2	18.2
3	1.8	88.0	90.5	3.8
4	12.4	68.0	78.9	0.3
5	24.8	82.0	95.9	13.5
6	5.3	78.0	85.2	1.1
7	5.3	86.0	93.2	7.2
8	3.5	72.0	77.4	0.2
9	5.3	84.0	91.2	4.6
10	7.1	90.0	98.5	24.3
TOTAL	83.2		104.7	100.0

SITE 52-1 JOHNSTON 16-FEB-78 1800-1900
BACKGROUND

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	644.3	56.0	84.1	****
TOTAL	644.3		84.1	100.0

SITE 52-1 JOHNSTON 16-FEB-78 1800-1900

SOURCE	TIME	SEL	LEQ	PCT. ENERGY
LOCO IDLING	169.9	104.0	68.4	3.1
LOCO MOVING	412.3	108.9	73.3	9.4
TRAINS MOVING	1204.8	112.2	76.6	20.2
CAR IMPACTS	114.5	110.0	74.4	12.1
THRU TRAINS	100.9	104.0	68.4	3.1
RETARDERS-WS	97.7	111.8	76.2	18.4
OTHER RR NOISES	30.8	99.3	63.7	1.0
NON RR AIRCRAFT	733.7	113.0	78.2	29.1
MISC.	83.2	104.7	69.1	3.6
BACKGROUND	644.3	84.1	48.5	0.0
TOTAL	3600.1	119.2	83.6	100.0

JOHNSTON SITE 52-2 16-FEB-78 10:03-11:00
LOCO IDLING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	121.3	74.0	94.8	7.1
2	159.1	72.0	94.0	5.9
3	333.0	72.0	97.2	12.4
4	77.7	70.0	88.9	1.8
5	216.4	72.0	95.4	8.0
6	185.0	70.0	92.7	4.3
7	85.1	70.0	89.3	2.0
8	203.5	72.0	95.1	7.6
9	240.5	72.0	95.8	8.9
10	46.3	72.0	88.7	1.7
11	14.8	72.0	83.7	0.5
12	190.5	74.0	96.8	11.2
13	40.7	74.0	90.1	2.4
14	22.0	70.0	83.5	0.5
15	86.9	70.0	89.4	2.0
16	57.3	72.0	87.6	2.1
17	14.8	70.0	81.7	0.3
18	140.0	70.0	91.7	3.5
19	135.0	72.0	93.3	5.0
20	296.0	70.0	94.7	6.9
21	236.8	70.0	93.7	5.6
TOTAL	2911.1		106.3	100.0

JOHNSTON SITE 52-2 16-FEB-78 10:03-11:00
LOCO MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	35.1	72.0	81.5	3.6
2	127.6	72.0	87.1	13.1
3	81.4	82.0	95.2	83.3
TOTAL	244.2		96.0	100.0

JOHNSTON SITE 52-2 16-FEB-78 10:03-11:00
OTHER RR AIR REL WHISTLE

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	1.8	76.0	75.7	1.6
2	1.8	74.0	73.7	1.0
3	3.7	80.0	82.7	8.2
4	3.7	80.0	82.7	8.2
5	5.5	80.0	84.4	12.3
6	1.8	78.0	77.7	2.6
7	1.8	86.0	85.7	16.3
8	1.8	78.0	77.7	2.6
9	1.8	82.0	81.7	6.5
10	1.8	90.0	89.7	40.9
TOTAL	25.9		93.5	100.0

JOHNSTON SITE 52-2 16-FEB-78 10:03-11:00
NON RR MOT VEH

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	3.7	82.0	84.7	20.3
2	3.7	76.0	78.7	5.1
3	1.8	78.0	77.7	4.0
4	1.8	76.0	75.7	2.6
5	1.8	78.0	77.7	4.0
6	1.8	82.0	81.7	10.2
7	1.8	84.0	83.7	16.1
8	1.8	86.0	85.7	25.5
9	5.5	78.0	82.4	12.1
TOTAL	24.1		91.6	100.0

JOHNSTON SITE 52-2 16-FEB-78 10:03-11:00
MISC.

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	53.6	78.0	95.3	33.2
2	40.7	74.0	90.1	10.0
3	22.2	76.0	89.5	8.7
4	37.0	78.0	93.7	22.9
5	5.5	76.0	83.4	2.2
6	5.5	76.0	83.4	2.2
7	5.5	78.0	85.4	3.4
8	18.5	76.0	88.7	7.2
9	25.9	76.0	90.1	10.1
TOTAL	214.6		100.1	100.0

SITE 52-2 JOHNSTON 16-FEB-78 10:03-11:00

SOURCE	TIME	SEL	LEQ	PCT. ENERGY
LOCO IDLING	2911.1	106.3	71.0	70.4
LOCO MOVING	244.2	96.0	60.7	6.6
OTHER RR AIR REL	25.9	93.5	58.2	3.7
NON RR MOT VEH	24.1	91.6	56.3	2.4
MISC.	214.6	100.1	64.8	16.9
TOTAL	3419.9	107.8	72.5	100.0

SITE GM-1 WILSMERE 04-18-79 10:51
OTHER RR NOISES AIR RELEASE

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	1.0	59.0	56.0	3.4
2	2.0	59.0	59.0	6.9
3	1.0	62.0	59.0	6.8
4	1.0	64.0	61.0	10.8
5	2.0	59.0	59.0	6.9
6	1.0	59.0	56.0	3.4
7	2.0	58.0	58.0	5.4
8	3.0	59.0	60.8	10.3
9	1.0	60.0	57.0	4.3
10	2.0	62.0	62.0	13.7
11	2.0	63.0	63.0	17.2
12	1.0	64.0	61.0	10.8
TOTAL	19.0		70.6	100.0

SITE GM-1 WILSMERE 04-18-79 10:51
RETARDERS-WS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	1.0	59.0	53.9	1.5
2	6.0	60.0	62.7	11.2
3	1.0	59.0	53.9	1.5
4	1.0	60.0	54.9	1.9
5	2.0	57.0	54.9	1.9
6	18.0	63.0	70.5	67.2
7	1.0	59.0	53.9	1.5
8	9.0	59.0	63.5	13.4
TOTAL	39.0		72.2	100.0

SITE GM-1 WILSMERE 04-18-79 10:51
NON RR NOISES AIRCRAFT MOTOR VEHICLES

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	120.0	64.0	81.8	5.2
2	34.0	70.0	82.3	5.9
3	76.0	78.0	93.8	82.6
4	28.0	71.0	82.5	6.1
5	15.0	60.0	68.8	0.3
TOTAL	273.0		94.6	100.0

SITE GM-1 WILSMERE 04-18-79 10:51-12:01
LOCO MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	32.0	59.0	68.1	2.1
2	16.0	59.0	65.1	1.0
3	11.0	58.0	62.5	0.6
4	12.0	57.0	61.9	0.5
5	30.0	62.0	70.8	3.9
6	20.0	58.0	65.1	1.0
7	7.0	56.0	58.5	0.2
8	10.0	57.0	61.1	0.4
9	23.0	58.0	65.7	1.2
10	31.0	59.0	68.0	2.0
11	39.0	72.0	82.0	51.0
12	36.0	67.0	76.6	14.9
13	18.0	63.0	69.6	3.0
14	28.0	66.0	74.5	9.2
15	35.0	60.0	69.5	2.9
16	23.0	63.0	70.7	3.8
17	15.0	58.0	63.8	0.8
18	8.0	59.0	62.1	0.5
19	20.0	57.0	64.1	0.8
TOTAL	414.0		84.9	100.0

SITE GM-1 WILSMERE 04-18-79 10:51
TRAINS MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	51.0	64.0	81.1	54.1
2	39.0	62.0	77.9	26.1
3	17.0	62.0	74.3	11.4
4	25.0	58.0	72.0	6.7
5	5.0	59.0	66.0	1.7
TOTAL	137.0		83.7	100.0

SITE GM-1 WILSMERE 04-18-79 10:51
CAR IMPACTS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	7.0	68.0	73.4	****
TOTAL	7.0		73.4	100.0

SITE GM-1 WILSMERE 04-18-79 10:51
MISC. RR NOISES

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	3.0	61.0	65.8	0.6
2	17.0	60.0	72.3	2.8
3	9.0	60.0	69.5	1.5
4	1.0	60.0	60.0	0.2
5	1.0	60.0	60.0	0.2
6	70.0	62.0	80.5	18.4
7	60.0	68.0	85.8	62.7
8	4.0	60.0	66.0	0.7
9	1.0	62.0	62.0	0.3
10	17.0	58.0	70.3	1.8
11	0.5	58.0	55.0	0.1
12	3.0	62.0	66.8	0.8
13	0.5	58.0	55.0	0.1
14	2.0	58.0	61.0	0.2
15	2.0	57.0	60.0	0.2
16	1.0	63.0	63.0	0.3
17	1.0	65.0	65.0	0.5
18	3.0	58.0	62.8	0.3
19	24.0	63.0	76.8	7.9
20	5.0	58.0	65.0	0.5
TOTAL	225.0		87.8	100.0

SITE GM-1 WILSMERE 04-18-79 10:51-12:01
BACKGROUND

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	3086.0	56.0	90.9	****
TOTAL	3086.0		90.9	100.0

SITE GM-1 WILSMERE 04-18-79 10:51-12:01

SOURCE	TIME	SEL	LEQ	PCT. ENERGY
LOCO MOVING	414.0	84.9	48.7	5.8
TRAINS MOVING	137.0	83.7	47.5	4.4
CAR IMPACTS	7.0	73.4	37.2	0.4
AIR RELEASE	19.0	70.6	34.4	0.2
RETARDERS-WS	39.0	72.2	36.0	0.3
NON RR AIRCRAFT	273.0	94.6	58.4	54.3
MISC.	225.0	87.8	51.6	11.3
BACKGROUND	3086.0	90.9	54.7	23.2
TOTAL	4200.0	97.3	61.0	100.0

SITE 1 PAVONIA 20-APRIL-79 11:19-12:21
LOCO MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	3.5	70.0	69.5	0.2
2	32.5	77.0	86.2	7.4
3	18.0	66.0	72.6	0.3
4	57.5	82.0	93.7	41.6
5	25.0	82.0	90.0	18.1
6	27.0	83.0	91.4	24.6
7	18.0	71.0	77.6	1.0
8	10.0	64.0	68.1	0.1
9	40.0	68.0	78.1	1.2
10	35.0	68.0	77.5	1.0
11	10.0	80.0	84.1	4.6
TOTAL	276.5		97.5	100.0

SITE 1 PAVONIA 20-APRIL-79 11:19-12:21
CAR MOVING AND ROLLING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	20.0	82.0	86.5	2.1
2	22.0	87.0	91.9	7.3
3	13.5	85.0	87.8	2.8
4	14.0	83.0	86.0	1.9
5	12.5	84.0	86.5	2.1
6	6.0	80.0	79.3	0.4
7	17.5	84.0	88.0	2.9
8	13.5	84.0	86.8	2.2
9	19.0	80.0	84.3	1.3
10	21.0	84.0	88.7	3.5
11	19.0	82.0	86.3	2.0
12	15.0	82.0	85.3	1.6
13	20.0	85.0	89.5	4.2
14	30.0	82.0	88.3	3.2
15	25.0	82.0	87.5	2.6
16	20.0	82.0	86.5	2.1
17	14.0	82.0	85.0	1.5
18	25.0	81.0	86.5	2.1
19	12.5	81.0	83.5	1.0
20	20.0	86.0	90.5	5.3
21	25.0	84.0	89.5	4.2
22	13.0	83.0	85.7	1.7
23	17.5	86.0	90.0	4.6
24	145.0	80.0	93.1	9.6
25	220.0	67.0	81.9	0.7
26	37.5	82.0	89.3	3.9
27	22.5	88.0	93.0	9.4
28	16.0	81.0	84.6	1.3
29	37.5	81.0	88.3	3.1
30	20.0	82.0	86.5	2.1
31	12.5	88.0	90.5	5.2
32	12.5	81.0	83.5	1.0
33	12.0	81.0	83.3	1.0
TOTAL	950.5		103.3	100.0

SITE 1 PAVONIA 20-APRIL-79 11:19-12:21
CAR IMPACTS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	0.5	79.0	73.0	7.6
2	0.5	77.0	71.0	4.8
3	0.5	70.0	64.0	1.0
4	1.0	82.0	79.0	30.4
5	0.5	71.0	65.0	1.2
6	0.5	75.0	69.0	3.0
7	2.5	66.0	67.0	1.9
8	1.5	67.0	65.8	1.4
9	8.0	75.0	81.0	48.6
TOTAL	15.5		84.2	100.0

SITE 1 PAVONIA 20-APRIL-79 11:19-12:21
OTHER RR AIR REL LS WHISTLES BELLS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	2.0	70.0	70.0	1.4
2	2.0	70.0	70.0	1.4
3	1.0	67.0	64.0	0.4
4	0.5	75.0	69.0	1.1
5	0.5	69.0	63.0	0.3
6	1.0	67.0	64.0	0.4
7	1.0	62.0	59.0	0.1
8	1.0	62.0	59.0	0.1
9	5.0	61.0	65.0	0.4
10	1.0	68.0	65.0	0.4
11	1.0	63.0	60.0	0.1
12	2.0	64.0	64.0	0.4
13	1.0	61.0	58.0	0.1
14	0.5	64.0	58.0	0.1
15	3.0	78.0	79.8	13.4
16	2.0	83.0	83.0	28.3
17	1.5	84.0	82.8	26.7
18	1.5	75.0	73.8	3.4
19	1.0	66.0	63.0	0.3
20	5.0	64.0	60.0	0.9
21	3.0	68.0	69.8	1.3
22	1.0	77.0	74.0	3.6
23	1.0	72.0	69.0	1.1
24	2.0	80.0	80.0	14.2
TOTAL	40.5		88.5	100.0

WYLE LABORATORIES

RECORDERS WS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	2.0	84.0	81.9	0.0
2	3.5	96.0	96.4	1.1
3	1.5	95.0	91.7	0.4
4	1.5	83.0	79.7	0.0
5	2.0	93.0	90.9	0.3
6	3.0	100.0	99.7	2.3
7	3.0	103.0	102.7	4.7
8	3.0	98.0	97.7	1.5
9	4.0	97.0	97.9	1.6
10	1.5	83.0	79.7	0.0
11	2.5	102.0	100.9	3.1
12	2.5	96.0	94.9	0.8
13	1.0	82.0	76.9	0.0
14	1.5	92.0	88.7	0.2
15	1.0	80.0	74.9	0.0
16	2.0	92.0	89.9	0.2
17	1.0	95.0	89.9	0.2
18	1.0	77.0	71.9	0.0
19	2.5	84.0	82.9	0.0
20	2.0	86.0	83.9	0.1
21	1.0	80.0	74.9	0.0
22	2.0	89.0	86.9	0.1
23	3.0	94.0	93.7	0.6
24	0.5	76.0	67.9	0.0
25	3.5	87.0	87.4	0.1
26	4.5	90.0	91.4	0.3
27	7.5	87.0	90.7	0.3
28	18.5	106.0	113.6	57.3
29	3.5	96.0	96.4	1.1
30	5.0	98.0	99.9	2.5
31	5.0	101.0	102.9	4.9
32	1.5	80.0	76.7	0.0
33	1.0	76.0	70.9	0.0
34	2.0	80.0	77.9	0.0
35	6.0	94.0	96.7	1.2
36	6.0	91.0	93.7	0.6
37	3.0	96.0	95.7	0.9
38	5.0	90.0	91.9	0.4
39	1.0	84.0	78.9	0.0
40	8.0	96.0	99.9	2.5
41	2.5	85.0	83.9	0.1
42	2.0	84.0	81.9	0.0
43	1.5	83.0	79.7	0.0
44	3.0	90.0	89.7	0.2
45	5.0	84.0	85.9	0.1
46	37.5	70.0	80.7	0.0
47	2.5	71.0	69.9	0.0
48	5.0	72.0	73.9	0.0
49	6.0	82.0	84.7	0.1
50	12.5	98.0	103.9	6.1
51	5.0	92.0	93.9	0.6
52	3.5	91.0	91.4	0.3
53	11.0	90.0	95.3	0.9
54	6.0	94.0	96.7	1.2
55	2.0	82.0	79.9	0.0
56	2.0	82.0	79.9	0.0
57	4.5	90.0	91.4	0.3
58	3.0	94.0	93.7	0.6
TOTAL	244.0		116.0	100.0

SITE 1 PAVONIA 20-APRIL-79 11:19-12:21
MISC.

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	0.5	76.0	73.0	1.5
2	0.5	75.0	72.0	1.2
3	0.5	77.0	74.0	1.8
4	4.0	70.0	76.0	2.9
5	80.0	72.0	91.0	92.6
TOTAL	85.5		91.4	100.0

SITE 1 PAVONIA 20-APRIL-79 11:19-12:21
NON RR MOT VEH SIRENS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	6.0	70.0	74.8	79.0
2	4.0	66.0	69.0	21.0
TOTAL	10.0		75.8	100.0

SITE 1 PAVONIA 20-APRIL-79 11:19-12:21
LOCO IDLING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	2097.5	60.0	93.2	****
TOTAL	2097.5		93.2	100.0

SITE 1 PAVONIA 20-APRIL-79 11:19-12:21

SOURCE	TIME	SEL	LEQ	PCT. ENERGY
LOCO IDLING	2097.5	93.2	57.6	0.5
LOCO MOVING	276.5	97.5	61.9	1.3
CAR ROLLING	950.5	103.3	67.7	5.0
CAR IMPACTS	15.5	84.2	48.6	0.1
RETARDERS-WS	244.0	116.0	80.4	92.7
OTHER RR AIR REL	40.5	88.5	52.9	0.2
NON RR MOT VEH	10.0	75.8	40.2	0.0
MISC.	85.5	91.4	55.8	0.3
TOTAL	3720.0	116.3	80.8	100.0

WYLE LABORATORIES

RETARDER NS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	2.0	65.0	62.9	2.1
2	11.0	73.0	78.3	71.8
3	3.0	60.0	59.7	1.0
4	1.0	65.0	59.9	1.0
5	2.0	69.0	66.9	5.2
6	2.5	63.0	61.9	1.6
7	2.0	63.0	60.9	1.3
8	3.0	63.0	62.7	2.0
9	1.0	58.0	52.9	0.2
10	2.0	62.0	59.9	1.0
11	1.5	61.0	57.7	0.6
12	2.0	64.0	61.9	1.6
13	2.0	59.0	56.9	0.5
14	2.0	59.0	56.9	0.5
15	1.0	62.0	56.9	0.5
16	1.0	62.0	56.9	0.5
17	1.5	60.0	56.7	0.5
18	3.0	64.0	63.7	2.5
19	0.5	60.0	51.9	0.2
20	0.5	61.0	52.9	0.2
21	2.0	63.0	60.9	1.3
22	1.0	63.0	57.9	0.7
23	1.0	69.0	63.9	2.6
24	1.0	62.0	56.9	0.5
TOTAL	49.5		79.8	100.0

SITE 3. Pavonia , 20-APRIL-79
NON RR AC MOT VEH PED. ANIM

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	7.0	56.0	61.4	0.2
2	18.0	65.0	74.5	4.7
3	67.0	61.0	76.3	6.9
4	72.0	63.0	78.6	11.8
5	15.0	66.0	74.8	4.9
6	13.0	58.0	66.1	0.7
7	47.0	65.0	78.7	12.2
8	24.0	64.0	74.8	4.9
9	35.0	56.0	68.4	1.1
10	38.0	64.0	76.8	7.8
11	21.0	58.0	68.2	1.1
12	15.0	71.0	79.8	15.5
13	36.0	64.0	76.6	7.4
14	9.0	62.0	68.5	1.2
15	55.0	53.0	67.4	0.9
16	56.0	43.0	57.5	0.1
17	28.0	58.0	69.5	1.4
18	14.0	66.0	74.5	4.6
19	19.0	59.0	68.8	1.2
20	19.0	65.0	74.8	4.9
21	10.0	64.0	71.0	2.1
22	12.0	59.0	66.8	0.8
23	24.0	61.0	71.8	2.5
24	13.0	60.0	68.1	1.1
25	9.0	53.0	59.5	0.1
TOTAL	676.0		87.9	100.0

SITE 3 Pavonia 20-APRIL-79
LOCO IDLING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	2.0	59.0	62.0	4.5
2	116.0	54.0	74.6	82.1
3	15.0	55.0	66.8	13.4
TOTAL	133.0		75.5	100.0

SITE 3 Pavonia 20-APRIL-79
LOCO MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	124.0	75.0	90.0	98.0
2	19.0	62.0	68.9	0.8
3	20.0	60.0	67.1	0.5
4	29.0	60.0	68.7	0.7
TOTAL	192.0		90.1	100.0

SITE 3 Pavonia 20-APRIL-79
TRAINS MOVING

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	31.0	58.0	72.9	11.9
2	114.0	57.0	77.6	34.6
3	46.0	56.0	72.6	11.1
4	71.0	55.0	73.5	13.6
5	25.0	54.0	68.0	3.8
6	50.0	54.0	71.0	7.6
7	30.0	55.0	69.8	5.8
8	19.0	55.0	67.8	3.6
9	11.0	56.0	66.4	2.7
10	11.0	59.0	69.4	5.3
TOTAL	408.0		82.2	100.0

SITE 3 Pavonia 20-APRIL-79
CAR IMPACTS

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	2.0	61.0	61.0	6.9
2	2.0	62.0	62.0	8.6
3	2.0	59.0	59.0	4.3
4	2.0	67.0	67.0	27.3
5	4.0	66.0	69.0	43.4
6	2.0	56.0	56.0	2.2
7	1.0	60.0	57.0	2.7
8	2.0	56.0	56.0	2.2
9	1.0	57.0	54.0	1.4
10	1.0	56.0	53.0	1.1
TOTAL	19.0		72.6	100.0

SITE 3 Pavonia 20-APRIL-79

MISC.

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	10.0	59.0	71.6	13.6
2	36.0	55.0	70.6	10.8
3	30.0	55.0	69.8	9.0
4	2.0	64.0	67.0	4.8
5	33.0	56.0	71.2	12.5
6	7.0	61.0	69.5	8.4
7	30.0	58.0	72.8	18.0
8	19.0	61.0	73.8	22.8
TOTAL	175.0		80.2	100.0

SITE 3 Pavonia 20-APRIL-79

BACKGROUND

EVENT NO.	DURATION (SEC.)	MAX. LEVEL	SEL	PCT. ENERGY
1	507.5	50.0	77.1	****
TOTAL	507.5		77.1	100.0

SITE 3 Pavonia 20-APRIL-79 2:20-02:56

SOURCE	TIME	SEL	LEQ	PCT. ENERGY
LOCO IDLING	133.0	75.5	42.2	1.7
LOCO MOVING	192.0	90.1	56.8	48.5
TRAINS MOVING	400.0	82.2	48.9	7.9
IMPACTS	19.0	72.6	39.3	0.9
RETARDERS-WS	49.5	79.8	46.5	4.5
NON RR AIRCRAFT	676.0	87.9	54.6	29.2
MISC.	175.0	80.2	46.9	5.0
BACKGROUND	507.5	77.1	43.8	2.4
TOTAL	2160.0	93.2	59.9	100.0

WYLE LABORATORIES

Source Contributions at Barr Yard, Riverdale, Illinois

Site 1

Date	Time	Source	Percent of Acoustic Energy
4/30/78	1030-1130	Locomotive Moving	44
		Train Moving	31
		Locomotive Idling	20
		Background	4
		Car Impact	<1
		Air Release	<1
		Wheel Squeal	<1
		Refrigerator Car	<1
		Motor Vehicle	<1

Source Contributions at Barr Yard, Riverdale, Illinois

Site 2

Date	Time	Source	Percent of Acoustic Energy
4/30/78	1400-1500	Locomotive Moving	39
		Train Moving	32
		Background	21
		Locomotive Idling	5
		Car Impact	2
		Locomotive Horn	<1
		Air Release	<1
		Wheel Squeal	<1
		Motor Vehicle	<1

Source Contributions at Barr Yard, Riverdale, Illinois

Site 3

Date	Time	Source	Percent of Acoustic Energy
4/30/78	1520-1620	Train Moving	62
		Locomotive Moving	26
		Background	9
		Locomotive Horn/Bell	1
		Motor Vehicles	1
		Car Impact	<1
		Air Release	<1
		Wheel Squeal	<1
		Loudspeakers	<1
5/1/78	0900-1000	Locomotive Moving	91
		Train Moving	5
		Background	3
		Locomotive Idling	<1
		Car Impact	<1
		Locomotive Horn	<1
		Loudspeakers	<1
		Motor Vehicles	<1

Source Contributions at Cicero Yard, Cicero, Illinois

Site 1

Date	Time	Source	Percent of Acoustic Energy
4/27/78	2115-2145	Locomotive Bell	55
		Background	23
		Locomotive Moving	10
		B.N. Truck	9
		Crane Engine	2
		Car Impact	<1
		Wheel Squeal	<1
4/27/78	2305-2335	Background	60
		Idling Crane Engine	28
		Crane Engine	9
		Air Release	2
		Crane Hoist	<1
4/28/78	1540-1640	Background	40
		Trucks	30
		Crane Engine	20
		Locomotive Moving	7
		Locomotive Idling	2
		Crane Hoist	<1
		Air Release	<1

Source Contributions at Cicero Yard, Cicero, Illinois

Site 2

Date	Time	Source	Percent of Acoustic Energy
4/27/78	1615-1715	Train Moving	43
		Locomotive Moving	31
		Background	12
		Locomotive Idling	5
		Ref. Trucks on Flat Cars	4
		Car Impact	3
		Wheel Squeal	<1
		Locomotive Horn	<1
		Motor Vehicles on Street	<1
4/27/78	2200-2300	Train Moving	49
		Locomotive Moving	41
		Refrigerator Car	6
		Background	2
		Locomotive Bell	1
		Car Impact	<1
		Group Retarder	<1
		Air Release	<1
		Wheel Squeal	<1
4/28/78	1235-1335	Maintenance Vehicles	44
		Train Moving	34
		Locomotive Moving	13
		Locomotive Idling	4
		Background	2
		Car Impact	1
		Air Release	1
		Group Retarder	<1
		Wheel Squeal	<1
		Loudspeakers/Locomotive Horn	<1

Source Contributions at Cicero Yard, Cicero, Illinois

Site 3

Date	Time	Source	Percent of Acoustic Energy
4/27/78	1415-1515	Through Passenger Trains	87
		Train Moving	9
		Background	2
		Locomotive Moving	1
		Car Impact	<1
		Adjacent Industrial Noise	<1

Source Contributions at Cicero Yard, Cicero, Illinois

Site 4

Date	Time	Source	Percent of Acoustic Energy
4/28/78	1430-1530	Locomotive Idling	98
		Locomotive Moving	1
		Loudspeakers	<1
		Locomotive Horn/Bell	<1
		Motor Vehicles	<1

Exhibit C

Number of Retarders Requiring Relocation

Class I Railroads in the United States - 1979

District and Road	No. of Retarders to be Relocated	No. of Tangent Point Retarders
EASTERN DISTRICT:		
1060 Baltimore & Ohio *	-	-
1080 Bessemer & Lake Erie	0	0
1090 Boston & Maine	11	0
1140 Chesapeake & Ohio *	40	50
1220 Conrail	96	0
1250 Delaware & Hudson	0	0
1280 Detroit, Toledo & Ironton	0	0
1310 Elgin, Joliet & Eastern	4	0
1370 Grand Trunk Western	0	0
1450 Long Island	0	0
1550 Norfolk & Western	24	0
1620 Pittsburgh & Lake Erie	0	0
1750 Western Maryland *	-	-
Total Eastern District	175	50
Total Southern District	82	12
Total Western District	148	104
Total United States	405	166
Total All US Railroads	471	166

Notes:

* Included in the Chessie System

District and Road	Retarders To Be Relocated	Tangent Point Retarders
SOUTHERN DISTRICT:		
*2020 Alabama Great Southern	-	-
*2110 Central of Georgia	-	-
*2220 Cincinnati, New Orleans & Tex. Pac.	-	-
2230 Clinchfield	0	0
2330 Florida East Coast	0	0
2400 Illinois Central Gulf	17	0
2470 Louisville & Nashville	11	0
2670 Seaboard Coast Line	10	0
*2700 Southern Railway	-	-
2750 Southern System	44	16
Total Southern District	82	16
WESTERN DISTRICT:		
3040 Atchison, Topeka & Santa Fe	20	48
3050 Burlington Northern	15	0
3170 Chicago & North Western	4	0
3200 Chicago, Milwaukee, St. Paul & Pac.	31	0
3210 Chicago, Rock Island & Pacific	19	0
3240 Colorado & Southern	0	0
3260 Denver & Rio Grande Western	1	0
3290 Duluth, Missabe & Iron Range	0	0
3340 Fort Worth & Denver	0	0
3410 Kansas City Southern (incl. L&A)	0	0
3490 Missouri-Kansas-Texas	0	0
3500 Missouri Pacific	14	0
3650 St. Louis-San Francisco	0	0
3660 St. Louis Southwestern	5	0
3680 Soo Line	0	0
3690 Southern Pacific	32	56
3740 Union Pacific	7	0
3760 Western Pacific	0	0
Total Western District	148	104

* Included in Southern System

Exhibit E

BEFORE THE
ENVIRONMENTAL PROTECTION AGENCY

Noise Emission Standards for
Transportation Equipment;
Interstate Rail Carriers
44 F.R. 22959 (April 17, 1979)

Statement of Walter W. Simpson

My name is Walter W. Simpson, and I offer the following statement as my testimony on behalf of the Association of American Railroads in the captioned rulemaking proceeding. I am Vice-President Engineering of Southern Railway Company. My jurisdiction includes the Departments of Communications & Signals and Maintenance of Way & Structures.

In the rulemaking the Environmental Protection Agency (EPA) has proposed a point source requirement for hump yard retarders. Starting January 1, 1982, EPA proposes that active or controlled retarder noise levels not be permitted to exceed 90 dBA (on an A-weighted scale) at a distance of 30 meters. To meet this standard the EPA recommends the installation of noise barriers around retarders similar to the experimental ones erected at the

Burlington Northern's Northtown Yard. The EPA claims that the use of such barriers will reduce retarder noise by 20 decibels on the average and further claims that technology is available at a reasonable cost to accomplish this.

Comments being submitted by the Association of American Railroads will address the EPA's claim regarding the amount of noise attenuation obtained through noise barriers. The AAR will refute the EPA's claim, documenting that the amount of noise reduction actually obtained by such barriers is significantly less than that which the EPA asserts.

My remarks focus on the costs incurred by the railroads to install such barriers and in particular on Southern Railway Company and its affiliated lines, which together operate a system of railroads commonly referred to as Southern Railway System (hereinafter referred to simply as "Southern"). Southern operates eight hump classification yards: Sevier Yard at Knoxville, Tennessee; Norris Yard at Birmingham, Alabama; Linwood Yard at Linwood, North Carolina; Debutts Yard at Chattanooga, Tennessee; Sheffield Yard at Sheffield, Alabama; Brosnan Yard at Macon, Georgia; Inman Yard at Atlanta, Georgia; and Inman Piggyback Yard, also at Atlanta.

The EPA on page 22965 of the proposed rulemaking and on page C-2 of the Background Document maintains that barriers ranging from 8 to 12 feet can be installed at $75 per linear foot.* Given the average length of master retarders at 150 feet and the average length of group retarders at 100 feet (of which there would be six per yard), the EPA claims that the cost to install the barriers will be $22,500 per master retarder and $15,000 per group retarder or $90,000 per railroad yard. These EPA projected costs are grossly understated.

In the first place, installation of noise barriers on each side of every retarder in Southern's eight hump yards will be an extremely difficult and expensive proposition since these yards are in operation and are critical links in our overall system. Due to inadequate clearance, installation of a recommended barrier similar to that in service at Northtown Yard would require large scale relocation of retarders, switches, and classification yards at all yards, with two of Southern's classification yards requiring total reconstruction of the retarder and switching areas and, in most cases, producing a resultant loss in class yard capacity.

Cost of the barrier itself (installed) is estimated to be $200 per linear foot. This cost estimate represents the cost of the barrier material uninstalled (exclusive of optional but necessary

*In the EPA's 1975 Background Document, the reference given for the cost estimate cited above, the EPA says that the cost of barriers per linear foot ranges from $70 to $100. That the EPA in 1979 would select $75 per linear foot - only $5 above the 1975 minimum - is incredible. The 1975 Background Document also indicates that the cost figures given reflect "material costs of initial installation". This language indicates that the per linear foot cost given includes only the cost of the material itself, excluding installation costs.

access doors), the cost of the concrete foundation and labor costs. The attached print by Armco Steel Corporation depicts the type of barrier which would be used in all likelihood, i.e., a 10-foot barrier measured from the top of the rail, with the peak of the barrier 8 feet on a perpendicular line to the rail track center. The barrier's construction consists of a concrete foundation, H-Beam steel column supports, and plate steel panels containing 3 inch fiber glass batting sealed in polyethylene bags for sound absorptive purposes.

The $200 per linear foot estimate to install the barrier proper represents just one factor in estimating the total cost to provide the EPA sound barriers at all Southern hump yards. Other cost factors which also contribute to the cost of barrier construction and which also must be considered are those costs associated with necessary track and retarder relocation, including relocation of nearby signal cables, instrument housings, photoelectric devices, lighting, and switch machines; the costs incurred for rewiring of retarders and switches; and the costs resulting from considerable lost-time interruptions to yard operations in each location (track days downtime and loss in car capacity). A summary tabulation of work required on a yard-by-yard basis is attached, with supporting detailed estimate sheets. The summary tabulation shows a cost of $14,556,000 to install the barriers (including barrier installation proper and necessary yard modification) and an additional estimated cost of $11,196,000 due to track downtime and loss in car capacity. Although the actual cost related to service interruption could be calculated to be somewhat lower or a good deal higher if time permitted a more thorough study, the latter figure does represent a good-faith effort to quantify that cost. Using the estimated cost, Southern's total cost to equip all of its retarder yards with the recommended barriers is projected to be $25,752,000. To this amount must be added an additional $210,000 to purchase specially equipped vehicles to disassemble and replace the barrier panels when needed. This makes for an overall compliance cost figure of nearly $26,000,000*. Southern's estimate is approximately 16** times greater than that which the EPA would project based on that agency's cost figure of $75 per linear foot, given the 21,727 feet of barrier length required to equip all eight yards.

The foregoing conclusively demonstrates that the EPA has substantially understated the costs which the railroad industry will incur if it is forced to construct noise barriers at all hump yards. Before the EPA seeks to promulgate a point source requirement for retarders which requires installation of a barrier that will not do what the EPA says it will do in the first place, the EPA needs to give a hard look at the actual costs involved. In Southern's view the costs are so exorbitantly high that imposition of a retarder requirement would be improper and unlawful.

Besides the large costs involved, there are other significant reasons which make the physical presence of barriers adjacent to

*The estimate is given in 1979 dollars. This figure does not include cost for real estate acquisition and/or rearrangement thereof where necessary to construct additional tracks to maintain present car capacity.
**Even if one considers just the cost related to necessary yard modification and actual barrier installation, Southern's cost estimate is still 11 times greater than the EPA's estimate.

car retarders ill-advised. One reason relates to safety. Barriers adjacent to car retarders subject operating and maintenance personnel to potentially unsafe situations in that the switchman's walkway area would be obstructed and the visibility of the adjacent tracks would be obscured. The visibility of the retarders by the retarder operator might also be obscured, thereby hindering the operator's ability to monitor the retarder operation to insure proper functioning. This is particularly true in older yards where retarder towers are located near group retarders.

Another important consideration stems from the maintenance problems associated with the use of such barriers. Because barriers preclude easy off-rail vehicular access to retarders, considerable maintenance difficulties would most certainly be encountered, particularly in connection with changing major components such as crossbars, shoe beams, operating beams, etc. Barriers would also introduce unacceptable delays to even routine maintenance jobs and would so complicate heavy repair work as to require complete shutdown of the retarders and a major portion of the class yard for protracted periods. Maintenance work on retarders is presently performed quickly and with minimal interruption to service. For example, in Northtown Yard where barriers are in use, crossbar changeout requires over four hours. The same task on the Southern requires 45 minutes or less.

The corollary maintenance problem relates to the removal of the barrier panels themselves. These barriers must be removable so that the railroad can gain close access to the retarder to perform maintenance or emergency work. In order to disassemble and replace the barrier panels themselves, the railroad would have to purchase specially equipped vehicles at an estimated cost of $30,000 per unit. Southern would need seven of these vehicles for the various yard locations.

Walter W. Simpson

Walter W. Simpson

Dated: June 22, 1979

Southern Railway Company
P. O. Box 1808
Washington, D.C. 20013
(202) 628-4460

ESTIMATED COST TO PROVIDE E.P.A. SOUND BARRIERS

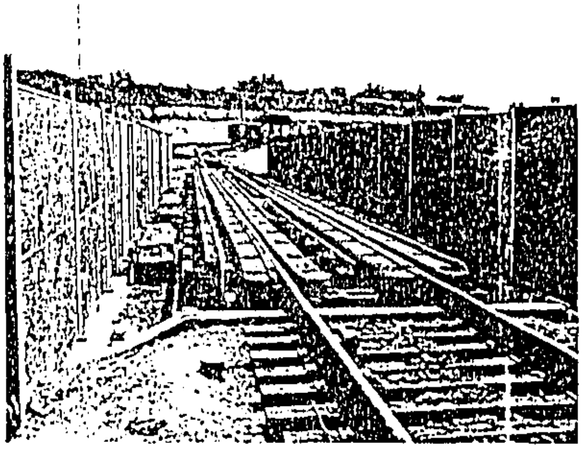
17 MAY 1979

Yard	Pin Pull	Master	Groups	Car Cap. Lost	Cost @ $10,000/Car	Tk. Days Downtime	Cost @ $1300/Day	Total
Sevier	$27,000	$ 86,000	$1,700,000	53	$530,000	1140	$1,482,000	$3,825,000
Norris	--	101,000	1,830,000	64	640,000	1200	1,560,000	4,131,000
Linwood	30,000	88,000	707,000	6	60,000	180	234,000	1,119,000
deButts	26,000	95,000	1,935,000	60	600,000	1290	1,677,000	4,333,000
Sheffield	26,000	73,000	806,000	12	120,000	360	468,000	1,493,000
Brosnan	28,000	75,000	284,000	0	--	0	--	
		Pullback Ret. - 144,000			Fwd. Ret. - 206,000			737,000
Inman	28,000	95,000	1,868,000	46	460,000	1170	1,521,000	
		Shove Ret. - 134,000						4,106,000
Inman Pig.	--	353,000	--	0	--	1260	1,638,000	
		Tangent Point Ret. - 4,017,000						6,008,000
					Total All Retarder Yards			$25,752,000

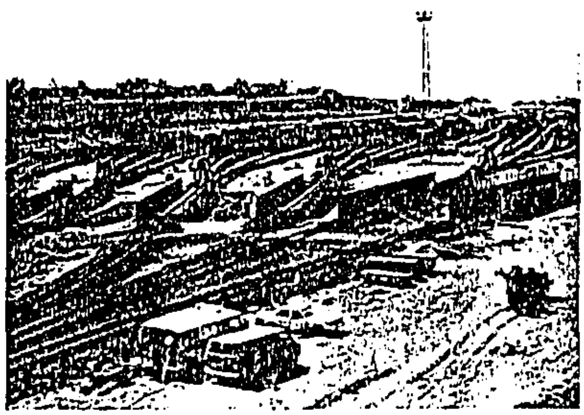
Notes:

1. Estimates do not include cost for real estate acquisition and/or rearrangement thereof where necessary to construct additional tracks to maintain present car capacity, e.g.: Inman Pig Yard - no space readily available to widen track centers.
2. Detail estimate sheets indicate the number of retarders required to be relocated to install barriers. Without these relocations, barriers cannot be installed on some of the remaining retarders such as adjacent retarders because of inadequate clearance.

NORTHTOWN YARD - BN RAILWAY



VIEW OF GROUP RETARDER - LOOKING TOWARD CLASS YARD. NOTE 8' HIGH SECTIONAL BARRIERS. R & L.



VIEW OF GROUP RETARDER AREA AS SEEN FROM TOWER - NOTE BARRIERS.

MAY. 1979

Addenda:

I. Method Used to Determine Value of "One Track Day" in Classification Yard:

Assume one group of 8 tracks is blocked out at a time, for one week (7 days, 24 hr/day).

a.	Cost to re-hump diverted cars 200 cars/day @ $6.00/car	$ 8,400/week
b.	Additional switch engine time required @ $73.00/hour	12,264/week
c.	Additional per diem payments as result of delay - based on 250 cars/day @ $6.00/car/day	10,500/week
d.	Estimated loss of earning potential based on 250 cars/day @ $24.00/day	42,000/week
	Week Total	$73,164
	÷ 7 = Daily Cost/Group	10,452
	÷ 8 = Daily Cost/Track	1,306 (use 1,300)

II. Restored Capacity Calculation (Typical)

For Norris Yard - Restored Capacity - 64 Cars (Additional Track)

Turnouts (Two Lap and Six #8's)	$ 220,000
Trackwork (Includes Grading, Drainage)	282,000
C&S Work (Incl. Skate Retarders)	92,000
Relocate Facilities (Road, Lights)	26,000
Lost Track Days During Lap Turnout Installations 2 Days (8 Tracks) @ $1300 per Track Day	20,000
	$ 640,000

or $10,000/Car

COST ESTIMATE — ROADWAY
Company

☐ New
☐ Retirement

PROGRAM NUMBER: 5-16-79/060

LOCATION: STATE:	VAL. SEC. NO.	STATION OR MP	DIVISION
INMAN YARD - ATLANTA, GA. - NOISE BARRIER INSTALLATION			

DESCRIPTION OF ITEM	CODE	ACCT. NO.	UNIT	QUANTITY	COST UNIT	COST TOTAL
SHOVE RETARDER (200')						134,000
REWIRE RETARDER						10,000
RELOCATE INSPECTION PITS (2 BUILDINGS)						20,000
CONSTRUCT BARRIER WALLS			L.F.	480	200	96,000
DOORS	4(2)(1)		EACH	8	1000	8,000
PIN PULLER RETARDER						28,000
REWIRE RETARDER						2,400
CONSTRUCT BARRIER WALLS			L.F.	170	200	34,000
DOORS			EACH	2	800	1,600
MASTER RETARDER (160')						95,000
REWIRE RETARDER						9,600
CONSTRUCT BARRIER WALL			L.F.	400	200	80,000
DOORS	2(3)(1)		EACH	6	900	5,400
GROUP RETARDERS (EIGHT) - RELOCATE FIVE GROUPS						1,868,000
REWIRE RETARDERS			EACH	8	4800	38,400
SWITCHES — 3 GROUPS W/7 TRACKS, 1 GROUP W/8 TRACKS, 1 GROUP W/10 TRACKS			EACH	34	1300	44,200
RELOCATE RETARDERS			EACH	5	6000	30,000
TRACKWORK RELOCATION (7 TRACKS/GRP)			GROUP	3	230,000	690,000
(8 TRACKS/GRP)			GROUP	1	260,000	260,000
(10 TRACKS/GRP)			GROUP	1	325,000	325,000
CONSTRUCT BARRIER WALL			L.F.	2240	200	448,000
DOORS	2(8)(8)		EACH	32	1012	32,400
CLASS TRACKS REDUCED CAPACITY			TOTAL INMAN YARD			$2,125,000
TRACKS OUT OF 46 CARS (10,000) - $460,000					CAPITAL	960,000
SERVICE 1,170 TRACK DAYS (1300) - $1,521,000					EXPENSE	1,165,000

GRAND TOTAL $4,106,000

COST ESTIMATE — ROADWAY

Company

☐ New

☐ Retirement

PROGRAM NUMBER: 5-16-75/060

LOCATION — STATE: | VAL. SEC. NO. | STATION OR MP | DIVISION

INTERMODAL FACILITY (PIG YARD)
INMAN YARD - ATLANTA, GA. - NOISE BARRIER INSTALLATION

DESCRIPTION OF ITEM	CODE	ACCT. NO.	UNIT	QUANTITY	COST UNIT	COST TOTAL
MASTER RETARDERS (THREE)						353,000
REWIRE RETARDER			EACH	3	5000	15,000
CONSTRUCT BARRIER WALL			L.F.	720	200	144,000
DOORS	2(2)(3)		EACH	12	967	11,600
RELOCATE RETARDERS			EACH	2	6000	12,000
TRACK RELOCATION (EIGHT TURNOUTS)			EACH	8	20,000	160,000
REWIRE SWITCHES			EACH	8	1300	10,400
TANGENT POINT RETARDERS (NINETEEN)						4,017,000
REWIRE RETARDER			EACH	19	1300	24,700
RELOCATE RETARDER			EACH	15	6000	105,000
CONSTRUCT BARRIER WALL			L.F.	2280	200	456,000
DOORS	1(3)(19)		EACH	35	1005	35,300
TRACK RELOCATION (WIDEN TRACK			LUMP SUM			3,390,000
CENTERS & RESTORE PARKWAY)						
		TOTAL	INMAN	PIG YARD		$4,370,000
					CAPITAL	730,000
					EXPENSE	3,640,000
TRACKS OUT OF SERVICE FOR RELOCATION		WORK	TRK DAY	1260	1300	$1,638,000
		GRAND TOTAL				$6,008,000

FORM 1703 (REV. 4/76)

COST ESTIMATE — ROADWAY

Company

☐ New

☐ Retirement

PROGRAM NUMBER 5-16-79/D60

LOCATION: STATE: | VAL. SEC. NO. | STATION OR MP | DIVISION

Brosnan Yard - Macon, Ga - Noise Barrier Installation

DESCRIPTION OF ITEM	CODE	ACCT. NO.	UNIT	QUANTITY	COST UNIT	COST TOTAL
Pin Puller Retarder						28,000
Rewire Retarder						2,600
Construct Barrier Walls			L.F.	120	200	24,000
Doors			Each	2	800	1,600
Master Retarder (120')						75,000
Rewire Retarder						7,200
Construct Barrier Wall			L.F.	320	200	64,000
Doors			Each	4	950	3,800
Group Retarders (Five) - No Relocation Work						284,000
Rewire Retarder			Each	5	4,800	24,000
Construct Barrier Wall			L.F.	1200	200	240,000
Doors	2(2)(5)		Each	20	1000	20,000
Pullback Retarders (Four) - No Track Relocation						144,000
Construct Barrier Wall			L.F.	680	200	136,000
Doors	1(2)(4)		Each	5	1600	8,000
Forwarding Yard Retarder (Eight) - No Trk Rel.						206,000
Relocate Retarder			Each	4	2000	8000
Rewire Retarder			Each	4	1300	5,200
Construct Barrier Wall			L.F.	880	200	176,000
Doors	1(2)(8)		Each	16	1050	16,800
No Reduced Yard Capacity						
No Track Out of Service			Total Brosnan			$737,000

Grand Total $737,000

Capital 690,000

Expense 47,000

FORM 1783 (REV. 4/78)

COST ESTIMATE — ROADWAY

Company

☐ New

☐ Retirement

PROGRAM NUMBER: 5-15-79/DGD

STATE:	VAL. SEC. NO.	STATION OR MP	DIVISION

LOCATION: Sheffield Yard - Sheffield, Ala. - Noise Barrier

DESCRIPTION OF ITEM	CODE	ACCT. NO.	UNIT	QUANTITY	COST UNIT	COST TOTAL
Pin Puller Retarder						26,000
Rewire Retarder						2,400
Construct Barrier Wall			L.F.	105	200	21,000
Doors			Each	2	1000	2,000
Master Retarder (115.5')						73,000
Rewire Retarder						7,000
Construct Barrier Wall			L.F.	311	200	62,200
Doors			Each	4	950	3,800
Group Retarders (six) - Relocate Two Groups						$706,000
Rewire Retarder			Each	2 / 4	4800 / 7000	37,600
Switches (2 Groups/w 6 Tracks)			Each	10	1300	13,000
Relocate Retarder			Each	2	6000	12,000
Trackwork Relocation (6 Tracks)			Group	2	193,000	386,000
Construct Barrier Wall			L.F.	1,666	200	333,200
Doors 2(2)(6)			Each	24	1000	24,000
			Total Sheffield			$905,000
				Capital		527,000
				Expense		378,000
Classification Track Reduced Capacity			Cars	12	10,000	$120,000
Track Out of Service - Relocation Work			Tr. Day	360	1,300	$468,000

Grand Total $1,493,000

FORM 1765 (REV. 4/70)

COST ESTIMATE — ROADWAY

Company

☐ New

☐ Retirement

PROGRAM NUMBER: 5-16-79/DCO

STATE:	VAL. SEC. NO.	STATION OR MP	DIVISION
DeButts Yard - Chattanooga, Tn. - Noise Barrier			

DESCRIPTION OF ITEM	CODE	ACCT. NO.	UNIT	QUANTITY	COST UNIT	COST TOTAL
Pin Puller Retarder						26,000
Rewire Retarder						2,400
Construct Barrier Wall			L.F.	110	200	22,000
Doors			Each	2	800	1,600
Master Retarder (160')						95,000
Rewire Retarder						3,600
Construct Barrier Walls			L.F.	600	200	120,000
Doors			Each	6	900	5,400
Group Retarders (Seven) - Relocate Five Groups						$1,935,000
Rewire Retarder			Each	5	4800	24,000
Switches 2 Groups w/5 Tracks 3 Groups w/9 Tracks			Each	38	1300	49,400
Relocate Retarder			Each	7	6000	42,000
Trackwork Relocation (5 Tracks/Group)			Group	2	260,000	520,000
(9 Tracks/Group)			Group	3	293,000	879,000
Construct Barrier Wall			L.F.	1960	200	392,000
Doors	3(3)(7)		Each	25	1024	25,600
Total DeButts Yard						$2,056,000
Capital						816,000
Expense						1,240,000
Classification Tracks Reduced Capacity			Car	60	10,000	$600,000
Tracks Out of Service For Relocation			Trk-Day	1290	1300	$1,677,000

Grand Total $4,333,000

FORM 1703 (REV. 6/78)

COST ESTIMATE — ROADWAY

Company

☐ New

☐ Retirement

PROGRAM NUMBER: 5-15-79/060

STATE:	VAL. SEC. NO.	STATION OR MP	DIVISION
NORRIS YARD - BIRMINGHAM, ALA. (IRONDALE) - NOISE BARRIER			

DESCRIPTION OF ITEM	CODE	ACCT. NO.	UNIT	QUANTITY	COST UNIT	COST TOTAL
MASTER RETARDER (175')						101,000
REWIRE RETARDER						9,600
CONSTRUCT BARRIER WALLS			L.F.	430	200	86,000
DOORS	3(2)(1)		EACH	6	900	5,400
GROUP RETARDERS (SEVEN) - RELOCATE FIVE GROUPS						1,830,000
REWIRE RETARDER			EACH	7	4800	33,600
SWITCHES (5 GROUPS W/5 TRACKS)			EACH	35	1300	45,500
RELOCATE RETARDER			EACH	5	6000	30,000
TRACKWORK RELOCATION (5 TRACKS/GRP)			GROUP	5	260,000	1,300,000
CONSTRUCT BARRIER WALL			L.F.	1960	200	392,000
DOORS	3(3)(7)		EACH	28	1032	28,900
		TOTAL NORRIS YARD				$1,931,000
					CAPITAL	777,000
					EXPENSE	1,154,000
CLASSIFICATION TRACKS REDUCED CAPACITY - 64 CARS						
			CAR	64	10,000	$640,000
TRACKS OUT OF SERVICE FOR RELOCATION WORK - 1,200 TRACK-DAYS						
			TRK. DAY	1200	1300	$1,560,000
		GRAND TOTAL				$4,131,000

FORM 1383 (REV. 6/78)

COST ESTIMATE — ROADWAY

Company

☐ New

☐ Retirement

PROGRAM NUMBER: 5-15-79/DLG

LOCATION

STATE:	VAL. SEC. NO.	STATION OR MP	DIVISION
Sevier Yard -	Knoxville, TN	Noise Barrier Installation	

DESCRIPTION OF ITEM	CODE	ACCT. NO.	UNIT	QUANTITY	COST UNIT	COST TOTAL
Pin Puller Retarder						37,000
Rewire Retarder						2,400
Construct Barrier Wall			L.F.	108	200	21,600
Barrier Doors			Each	3	550	1,700
Rewire Switches (West End Scale)						1,300
Master Retarder (140')						$56,000
Rewire Ret.						7,000
Rewire Switch (East End Scale)						1,300
Construct Barrier Wall			L.F.	360	200	72,000
Doors			Ea.	6	950	5,700
Group Retarders (Six) - Relocate Five Groups						1,700,000
Rewire Retarder			Each	6	4500	33,500
Switches 3 Groups w/5 Trks, 2 Groups w/7 Trks			Each	33	1300	42,900
Relocate Retarder			Each	5	6,000	30,000
Trackwork Relocate (5 Tracks)			Group	3	260,000	780,000
(7 Tracks)				2	230,000	460,000
Construct Barrier Wall			L.F.	1668	200	333,600
Doors (3)(3)(6)			Each	24	1029	24,700
Classification Tracks			Total Sevier Yard			$513,000
Reduced Capacity - 53 Cars (10,000) - $530,000					Capital	713,000
Tracks Out of Service for					Expense	1,100,000
Relocation - 1,160 Track-Days (1000/day) - $1,152,000						

Grand Total $3,525,000

FORM 1783 (REV. 4/79)

COST ESTIMATE — ROADWAY

Company

☐ New

☐ Retirement

PROGRAM NUMBER: 5-15-79/DCG

STATE:	VAL. SEC. NO.	STATION OR MP	DIVISION
Linwood Yard	- Linwood, N.C. -	Noise Barrier	Installation

DESCRIPTION OF ITEM	CODE	ACCT. NO.	UNIT	QUANTITY	COST UNIT	COST TOTAL
Pin Puller Retarder						30,000
Rewire Retarder						2,400
Construct Barrier Wall			L.F.	125	200	25,000
Doors			Each	2	1000	2,000
Master Retarder (145')						58,000
Rewire Retarder						7,000
Construct Barrier Wall			L.F.	375	200	75,000
Doors			Each	6	900	5,400
Group Retarders (Eight) - Relocate One Group						707,000
Rewire Retarders			Each	8	7,000	56,000
Switches (1 Group w/6 Tracks)			Each	5	1,300	6,500
Relocate Retarder			Each	1	6,000	6,000
Trackwork Relocation (6 Tracks)			Lump Sum			60,000
Construct Barrier Walls			L.F.	2700	200	540,000
Doors	3(4)(3) 3(3)(5)		Each	35	1013	35,500
		Total	Linwood Yard			$825,000
				Capital		687,000
				Expense		138,000
Classification Tracks Reduced Capacity -				60 Cars (10,000)		$60,000
			Day	180	1300	$234,000
Tracks Out of Service for Relocation Work -				180 Track Days		

Grand Total $1,119,000

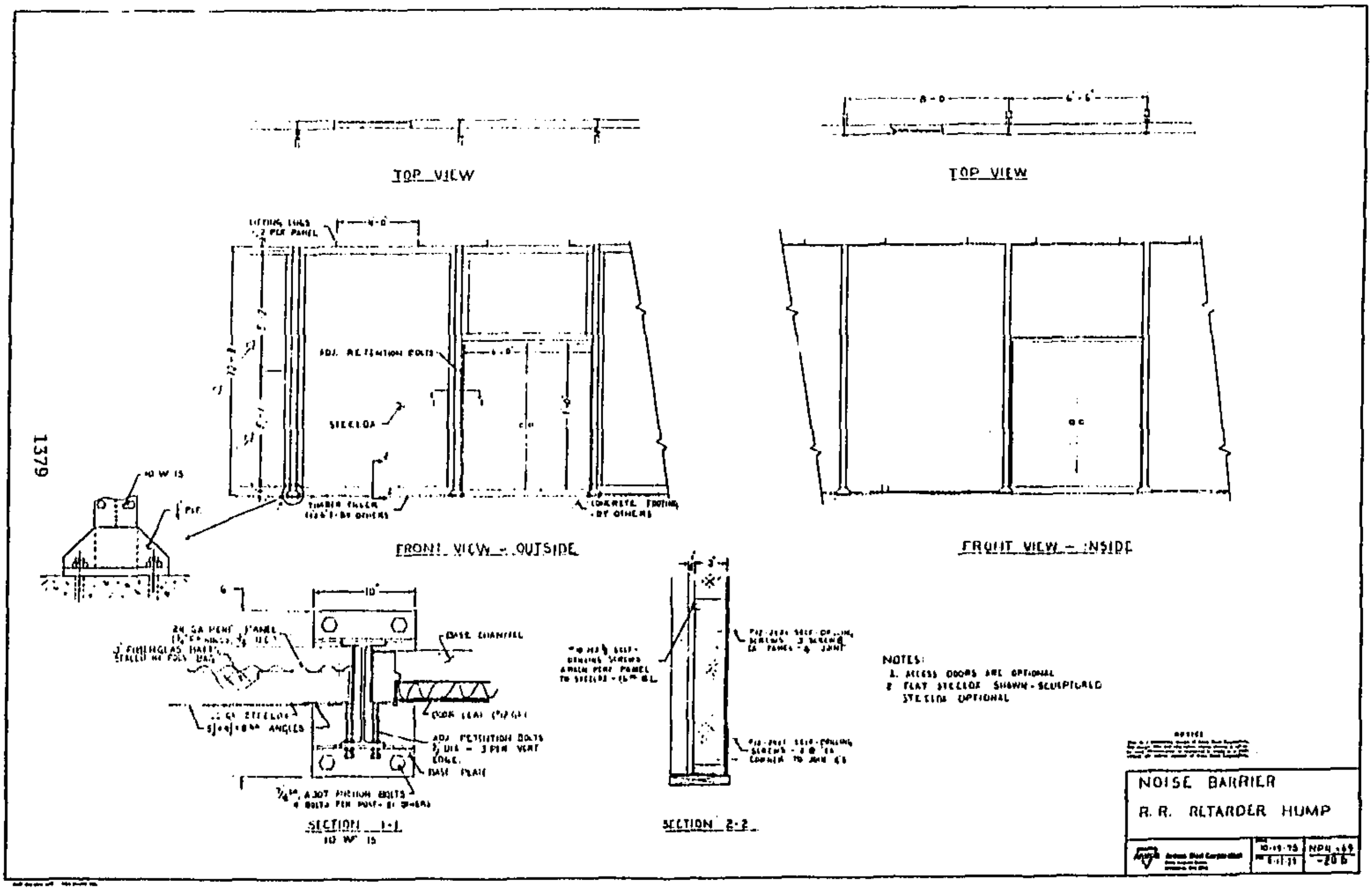

TOP VIEW
TOP VIEW
FRONT VIEW - OUTSIDE
FRONT VIEW - INSIDE
SECTION 1-1
10 W 15
SECTION 2-2
NOTES:
1. ACCESS DOORS ARE OPTIONAL
2. FLAT STEELOX SHOWN - SCULPTURED STEELOX OPTIONAL
NOISE BARRIER
R.R. RETARDER HUMP

Exhibit G

EMD SWITCHER LOCOMOTIVE SOUND LEVELS WITH AND WITHOUT SILENCERS*

Throttle Position		Low Idle	Idle	Idle	1	2	3	4	5	6	7	8
Cooling Fan		ON	ON	OFF	ON	ON	ON	ON	ON	ON	ON	ON
MP15AC with spark arrestor manifolds		65	65	65	63	73	78	81	83	85	87	90
MP15AC with spark arrestor/silencer		63	65	65	68	72	75	78	80	82	84	85
Radiator shutter position		OPEN	OPEN	CLOSED	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN
SW1001 with spark arrestor manifolds			65	65	66	73	77	79	80	84	[illegible]	89
SW1001 with spark arrestor/silencer			65	65	66	72	76	78	82	82	83	86

*Single unit sample dB(A) -- slow response central tendency, 100 ft. to the side of the locomotive on a stationary load test. Source: EMD.

EXHIBIT H

VERIFIED STATEMENT OF R. A. DRENGLER

Mr. R. A. Drengler is the Director of Suburban Operations of the Chicago and North Western Transportation Company. In that capacity he is responsible for the operation of suburban passenger trains operated by the North Western under a service contract with the Regional Transportation Authority.

The North Western operates approximately 190 suburban trains each week day on three separate lines extending from Kenosha, Wisconsin to Chicago; Harvard, Illinois to Chicago and Geneva, Illinois to Chicago. In order to provide efficient passenger service to its customers the North Western stores locomotives and trains at various yards throughout the Chicago Metropolitan area. Most of these yards are small and provide essentially only such space as is absolutely necessary for the storage of locomotives and cars.

The North Western coach yard at Barrington, Illinois is an illustration of such a yard. Several years ago at the insistence of the Village of Barrington, Illinois, the North Western moved the coach yard where suburban passenger equipment is stored from the center of the Village to an area outside of Barrington. This coach yard contains three tracks, which accommodate three E8 suburban locomotives and twenty-six passenger cars forming three suburban trains. There is no room at this location for the construction of additional tracks, nor is there room within the coach yard itself to do anything other than store the trains on the designated tracks. As a result, during those months when the temperature falls below forty degrees Fahrenheit, three diesel locomotives must be kept at idle during the night on tracks which are closely adjacent to the property line of the Company and property line of adjoining neighbors. I am advised that the locomotives individually comply with existing federal regulations with respect to noice emissions. I am also advised, however that the noise from the Barrington coach yard will probably exceed the property line noise standard proposed in the regulations of the Environmental Protection Agency for railroad yards.

The locomotives and passenger trains cannot be removed from the Barrington coach yard because to do so would be to seriously disrupt the North Western's passenger service. In addition, the coach yard is located by agreement with the Village of Barrington at a location designed to eliminate, as much as possible, the problems associated with railroad operations.

The North Western has equipped its passenger locomotives with mufflers, which, to some extent, reduce the noise from the Cummins auxiliary diesel engines on the units. The auxiliary diesel engines supply the power for light and air-conditioning to the trains. Tests with Chicago and North Western passenger locomotives has demonstrated, however, that at idle and low throttle settings, little, if any attenuation of noise is provided by mufflers on the main engines.

Because of the problems associated with storing diesel locomotives at many locations in the Chicago Metropolitan area, such as that described at Barrington, Illinois, the proposed regulations of the Environmental Protection Agency would have a serious, if not catastrophic effect upon the ability of the Chicago and North Western to provide suburban passenger service to its customers and to the Regional Transportation Authority.

R. A. Drengler

STATE OF ILLINOIS)
) SS
COUNTY OF C O O K)

R. A. DRENGLER, being first duly sworn, on oath deposes and states that he has read the foregoing statement and that the matters set forth therein are true and correct.

R. A. Drengler

SUBSCRIBED AND SWORN to before me this 12th day

of June, 1979.

Judith A. Cohne
Notary Public

EXHIBIT J

STATEMENT OF ROBERT F. McKEE

My name is Robert F. McKee. I am employed by the Pacific Fruit Express Company at 116 New Montgomery Street, San Francisco, California 94105 as General Mechanical & Engineering Officer.

I hold a Mechanical Engineering degree from University of California at Berkeley and am a graduate of the Executive Development course at Stanford Business School. I have been employed by Pacific Fruit Express Company for 33 years and during that entire time, my work has been in the field of engineering for that company. As head of the Mechanical and Engineering Department, I am responsible for the design, specifications, construction and maintenance of the PFE refrigerator car fleet. My last 21 years have been devoted to the maintenance, servicing and technical design problems of the mechanical refrigerator car. In addition to my duties at Pacific Fruit Express, I am Assistant Editor of the Railway Refrigerator Car Chapter of the Guide and Data Book of the American Society of Heating, Refrigerating, Air Conditioning Engineers (ASHRAE) and am also a member of the Technical Committee on Transport Refrigeration of that organization. In addition, am a member of the Commission on Refrigerated Rail Transport of the International Institute of Refrigeration. I am also a registered Professional Engineer in the State of California.

The AAR has requested that I furnish a narrative account of the development and design background of the refrigerator car, including industry efforts on refrigerator car noise attenuation that will illustrate that there is no current technology available that will reduce the refrigerator car point source noise level to 78 db at 7 meters as called for in the proposed noise standards without seriously effecting the design function of the system and at an exorbitant cost to the railroad refrigerator car industry. Furthermore, it is my opinion that the EPA Background Document and supporting literature on refrigerator car noise is woefully inadequate and shows a total lack of knowledge and understanding of the design and cost implications involved in any noise reduction efforts on these units.

The mechanical refrigerator car in common use on the railroads of the United States is arranged as shown in the attached cutaway illustration of a mechanical refrigerator car.[1] A portion of the "A" end of the car is devoted to the engine compartment which contains the diesel engine driven electric generator set and the condensing unit of the mechanical refrigeration system, plus the various control equipment which automatically operates the system to provide heating and cooling. This engine compartment contains all of the noise producing equipment involved in the refrigeration car. The electric refrigeration system design was adopted with the beginning of the mechanical refrigeration

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[1]See mechanical refrigerator car cutaway illustration.

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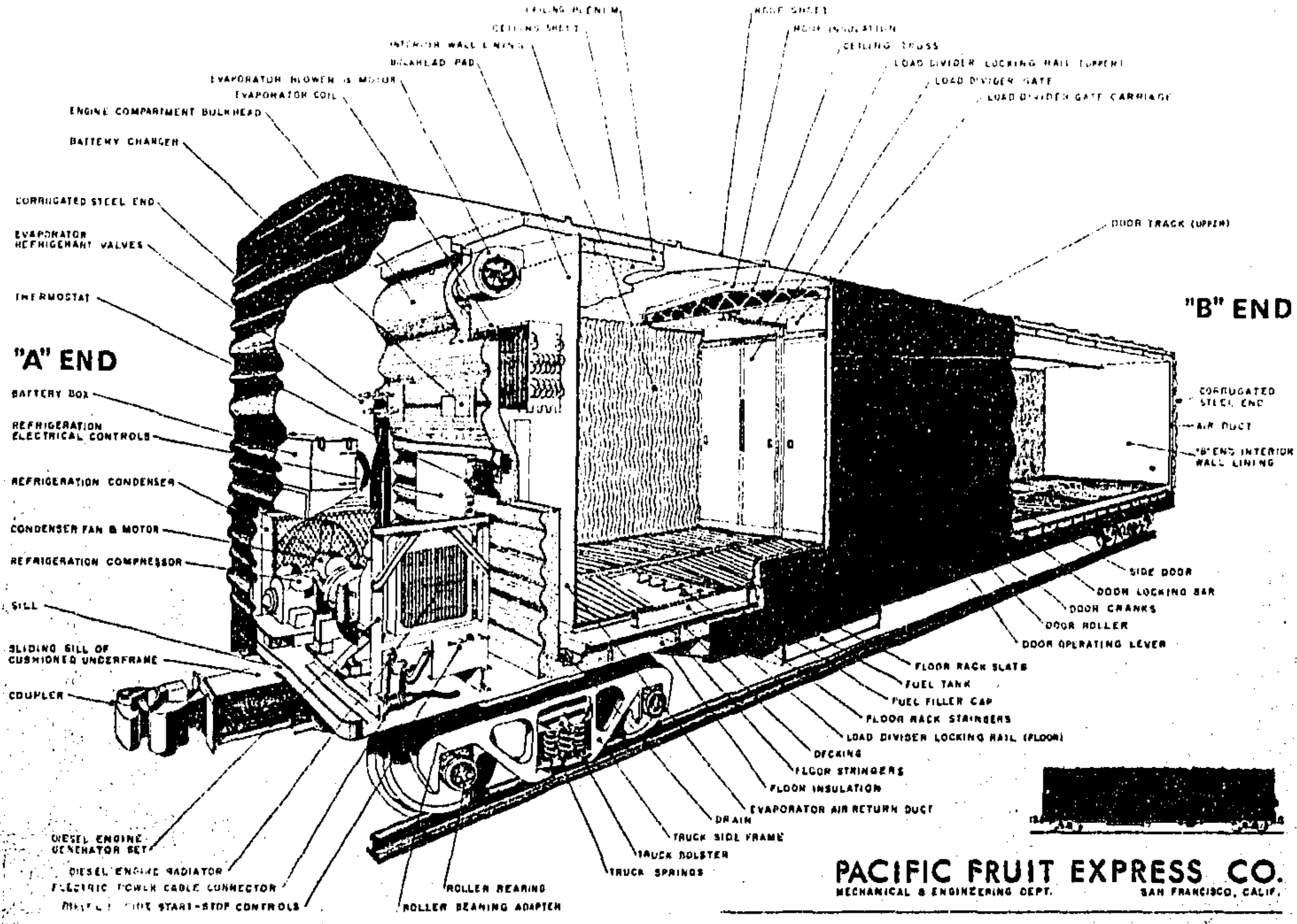
Exhibit



[redacted]

PACIFIC FRUIT EXPRESS CO.

MECHANICAL & ENGINEERING DEPT. SAN FRANCISCO, CALIF.

MECHANICAL REFRIGERATOR CAR
CUTAWAY ILLUSTRATION

1586

car in the early 1950's as being the most practical source of refrigeration which would be familiar to mechanics everywhere due to its similarity to commercial systems from which its components are derived. Use of standard electrical motor driven components permits the refrigerator car to be connected to an external electrical power sources for operation indoors and in other confined locations where operation of the diesel engine would be unacceptable.

Design of the compartment was such that space was limited to that actually needed for the equipment and access to it by the mechanics performing inspections, maintenance, and necessary light repairs in order to provide maximum refrigerated loading space. The principal design goal was maximum flow of cooling air through the compartment inasmuch as both the condensing unit and the diesel engine are cooled by outside air. This entailed large grilled openings for intake air to the condensing unit and a large discharge grille for exhaust of the cooling air through the opposite side of the compartment where the engine radiator is located. This equipment must operate at the extremes of temperature encountered in railroad operation, including ambients of as high as 120°F (49°C). The aim is to bring as much air flow through the compartment as possible to dissipate heat rejected by the refrigeration unit and the diesel engine under the maximum service conditions. Reducing this air flow by blocking or baffling air inlet or outlet openings as a noise abatement measure will render the mechanical refrigerator system unsuitable to operate within the environment and design conditions these refrigerator cars are subjected to in normal operation.

The mechanical refrigerator car type differs markedly from the conventional truck refrigeration unit, which in addition to having less refrigeration capacity due to the smaller size of highway trailers, also has restrictions in space and weight due to size and weight laws governing highway operations. Therefore, the truck system utilizes a smaller diesel engine directly connected to the compressor with auxiliary drive to operate both the condenser cooling fan and the evaporator blower circulating the cooling air inside the vehicle. This standard unit does not have provisions for connecting to auxiliary electric power and only can provide heating and cooling when the diesel engine is in operation, although special designs are available which are equipped with electric motors for auxiliary power operation. As a result, the truck refrigerator system by its basic design criteria inherently produces less noise than the mechanical refrigerator car system. Furthermore, due to the difference in the environmental conditions of switching shocks and rail car vibration in the railroad mode vs. pneumatic tire truck/trailer sytems, diesel equipment was selected of the heaviest, high capacity design available to assure ability to survive in the railroad operating environment and to provide maximum refrigeration protection to the perishable lading. A decade of early engine development led to selection by railroad refrigerator car lines of the Detroit Diesel two-cycle engine over all others, and today practically all other makes of engines have been replaced by the Detroit Diesel in the current refrigerator car fleet.[2] This engine inherently heavier and being of a two-cycle design generates greater noise level per horsepower than the smaller four-cycle automotive type diesel engine used in the truck/trailer refrigeration systems.

The EPA background document repeatedly compares the noise produced by the standard truck refrigeration unit and the mechanical car unit with the implication that adopting the truck engine muffler design to the refrigerator car might reduce the noise from the refrigerator car to meet the proposed standards. A comparison of the physical dimensions of the two different mufflers readily shows that the refrigerator car muffler is a far superior, heavy-duty design than the typical trailer unit.

	Length	Diameter
Refrigerator Car[3]	42"	7"
Truck Unit	12"	4 1/2"

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[2]See attached Photograph No. 1.

[3]See attached Drawing DR-7892.

The noise level of the mechanical refrigerator car was recognized as a problem early in the development of this equippment and extensive experimentation and testing was conducted by the industry to analyze the noise characteristics of the systems and to apply the best available technology to the systems to reduce the noise to the maximum extent possible without adversely effecting the primary function of the various components of the system. First, a special heavy-duty overside muffler was developed that would reduce noise levels to the greatest extent possible when measured at 25 feet from from the engine compartment, and at the same time keep engine back pressure within design limits, and also function as a U.S. Forestry Service approved spark arrestor to prevent wayside fires when traveling through national forests and other wooded or grassy areas in the dry season. The present heavy-duty muffler now installed in virtually every refrigerator car is the result of this development work.[4] Also as a personnel safety measure and noise abatement technique, the flexible muffler pipe connecting the muffler to the manifold and the muffler itself are covered with an asbestos wrapping material.[5] Attention was also given to selection of condenser fans by the refrigeration equipment suppliers to keep them within

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[4]See attached Drawing DR-7892.

[5]See atttached Drawing DR-8020 and Photograph No. 2.

the range of fan performance for commercial refrigeration system on rooftops or adjacent to business buildings.

Continuing testing and experimentation of noise control technology has been conducted within the refrigerator car industry by both the manufacturer and the fleet operators. For example, recent experiments were run on a number of different designs of engine cooling fans claimed by the manufacturer to reduce the noise level below; however, we found no measurable reduction from the original equipment cooling fan design.

Noise readings taken at difficutl angles from the refrigerator car engine compartment consistently show that the highest noise levels measured at seven meters are uniformly on engine compartment doorway side facing the engine radiator discharge. As all the condenser and engine cooling air exhausts at this point, this presents the major exit for all noise sources within the engine compartment due to the free flow provided for the exiting cooling air. However, the engine frame is very close to the exiting air grille in order to fit it into the available space within the engine compartment. This prevents the addition of ducting or baffling at this point, since it would require extension of the side of the car which is already at its maximum allowable width under AAR clearance diagrams for operation on American railroads. Also, unfortunately, one of the ladders required for the use of brakemen under the Federal Safety Appliance laws is also located in front of this discharge grille and the required clearance behind ladder rungs and stiles precludes any use of this space for noise attenuation devices. Therefore, employment of any means currently available to attenuate noise emissions at this point is not possible.[6]

Noise sources within the compartment are composed mainly of muffler noise, fan noise, and inherent engine mechanical noise. Our experience has also shown that the spark arresting muffler in use reduces that noise source to a level approximately equivalent to the inherent engine mechanical noise; therefore, even the development and application of a superior muffler would not reduce the total noise level.

In the Background Document for the Proposed Revision to Rail Car Noise Emission Regulation on pagea 5-8, reference is made to require technology for reducing noise emissions from mechanical refrigerator cars having been applied to truck and trailer mode refrigeration units per Reference No. 4 entitled "Noise Control Technology for Truck Mounted Refrigeration Units," BBN Report #3264 submitted to the U.S. Environmental Protection Agency, March 1976. This is an erroneous assumption, inasmuch as the basic arrangement of the truck and trailer refrigeration system is entirely different from the refrigerated car, as has been pointed out heretofore. The orientation of the truck/trailer unit

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[6]See attached Photograph Nos. 3 and 4.

grille is facing the direction of motion, and most noise emission is in that direction, whereas in the refrigerator car it is in the direction of 90° to the route of travel, which is the most objectionable direction. Aside from this, the methods of applying a better muffler and application of sound absorption foam in the truck/trailer system applies to a basically different engine in a much smaller engine enclosure. Both of these factors lend themselves to fairly simple noise reduction technology, whereas the engine located in a large crowded steel room in the rail car presents an entirely different problem, and there is no development work from which to draw conclusions as was available in the reference enumerated above.

Essentially, the rail car problem is one of a large mobile engine room, constructed of steel, containing openings 90° to the direction of travel, which direction is toward noise receiving areas. The basic solutions for this problem would be to either baffle such openings or close them and contain the noise entirely within the compartment, or emit it in a less objectionable direction, such as through the roof. This would require a major rearrangement of the entire compartment at an expense probably closely approaching the cost of replacing the present diesel engine with one generating less noise. Such a cost would be in the order of $5,000 per car. However, no suitable replacement engine is known to be available at this time, and the resetting of the presnt engine in some way within the present compartment space is wholly unexplored and would require considerable time, cost and effort to develop and test the results with the final noise reduction effect unknown.

Other factors which must be considered in evaluating various approaches to possible noise attenuation efforts on the mechanical equipment within the engine compartment is the already limited access to unit components for service, maintenance and repair personnel. Access to the components which require inspection and service is at best now quite restricted and any appreciable obstructions such as enclosures, shrouding, or placement of matting within the compartment will render proper inspection and service all but impossible.[7]

Furthermore, certain operational indicating lights and temperature setting thermostat must be readily visible and accessible for easy, fast viewing during daily in-transit inspections required by National Perishable Freight Conference Rules. Any closing off of the grille work on the engine compartment of the car would render the in-transit inspection function difficult and time consuming thereby slowing the movement of cars. Moreover, the temperatures inside the engine compartment in high ambient regions can reach as high as 140°F (60°C). Service personnel must remain within the

[7] See mechanical refrigerator car cutaway illustration and Photograph No. 1.

engine compartment with the engine running for some time during certain inspection and maintenance operations; therefore, there must free outside air circulation through the engine compartment for the health and safety of refrigerator car service personnel and partial blocking of the present compartment openings would aggravate the problem.

On page 10 of the EPA background, the EPA has made a totally inaccurate and unfounded statement with respect to the techniques and costs available to abate refrigerator car noise. The document assigns a $10 added cost of an improved muffler based on a five-year life. Current experience after considerable study and examination of mufflers in service for over 16 years indicates that the heavy-duty mufflers are in excellent condition and will not require periodic replacement at this age. Given that a more effective muffler was even available, the most conservative estimate of the replacement cost of a muffler installed would be $125, rather than the $10 added cost estimate contained in the background document.

The background document also mentions, without explaining a fan modification at a cost of $10. The refrigerator car mechanical system contains at least two fans, the condenser fan (two on some designs) and radiator cooling fan. Each has a set speed, diameter, number of blades, static pressure design and air flow design. Altering any one of these five criteria will adversely effect the other; therefore, any fan alteration will by necessity require complete replacement of each fan assembly, including the support components, driving electric motors (condenser fan) and fan shrouding. The space limitations, engineering, design and installation problems related to such a "modification" are unimagineable; however, a conservative estimate for such a modification would be $2,500 per car.

The development of the mechanical refrigerator car itself was a very expensive project and this vehicle has never reached the profitability expected of it to warrant such development costs, as well as the cost of acquisition of the large fleet of mechanical cars now in service which replaced the ice bunker car. Economically, the mechanical refrigerator car was dealt a death blow by the completion of the interstate highway system and advent of long range tractors and refrigerated semi-trailers capable of handling refrigerated loads in a fraction of the transit time required by rails, especially in the last decade which saw the decay of the eastern railroad systems leading to mergers and bankruptcies. As the highway fleet of modern refrigerated trailers proliferated, the percentage of fresh perishables in rail cars dwindled to a very small portion of the total. This has resulted in a loss situation for operation of the mechanical refrigerator car, requiring contracts to be implemented between railroads using such equipment and the owners as a basis for sharing such losses. To further burden the costs of mechanical refrigerator cars with a large and costly redesign at this point, would effectively drive them out of the national picture as far as handling of perishable foodstuffs is concerned.

The proposed regulations, furthermore, appear to violently discriminate against the mechanical refrigerator car by imposing unsubstantiated noise levels measured only seven meters from the vehicle. In my observations of the use of mechanical refrigerator cars over the years, I can recall no situation when a noise sensitive receiving property would be as close as seven meters (23 feet); and when the mechanical refrigerator car is viewed in terms of exact locations respecting property lines, it would seem that the measurement should be taken at 50 feet as was previously considered the logical distance from which to measure noise emissions. I can find nothing in the background document or literature to directly substantiate the limit of 78 db at seven meters. In view of the above, I strongly recommend the proposed standards be modified to accommodate the existing fleet of mechanical refrigerator cars on the basis of EPA studies that recognize the present sound level as being that able to be accomplished with presently available technology within reasonable cost limitations.

R. F. McKee

R. F. McKee
General Mechanical & Engineering Officer
Pacific Fruit Express Company
San Francisco, California

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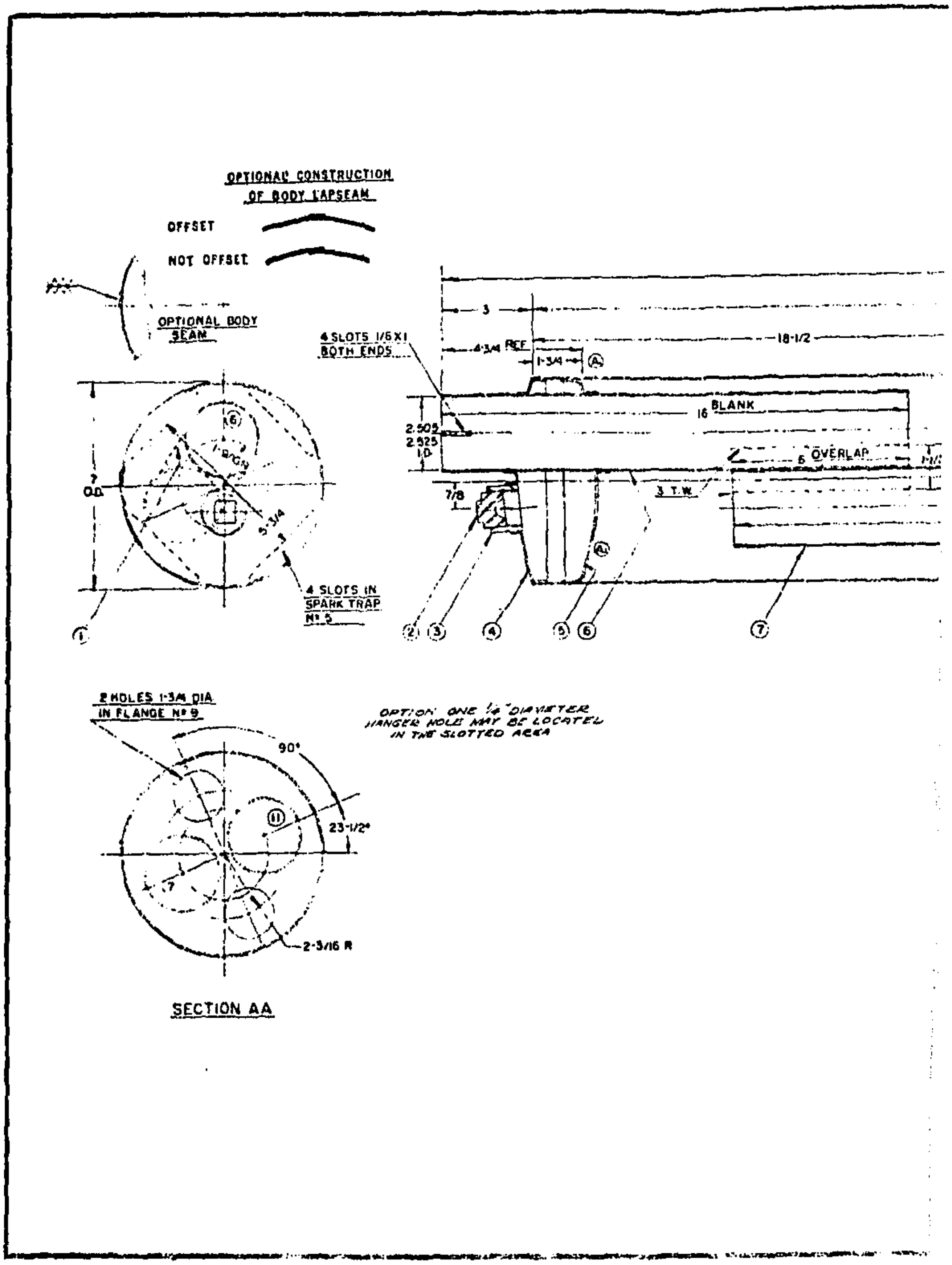
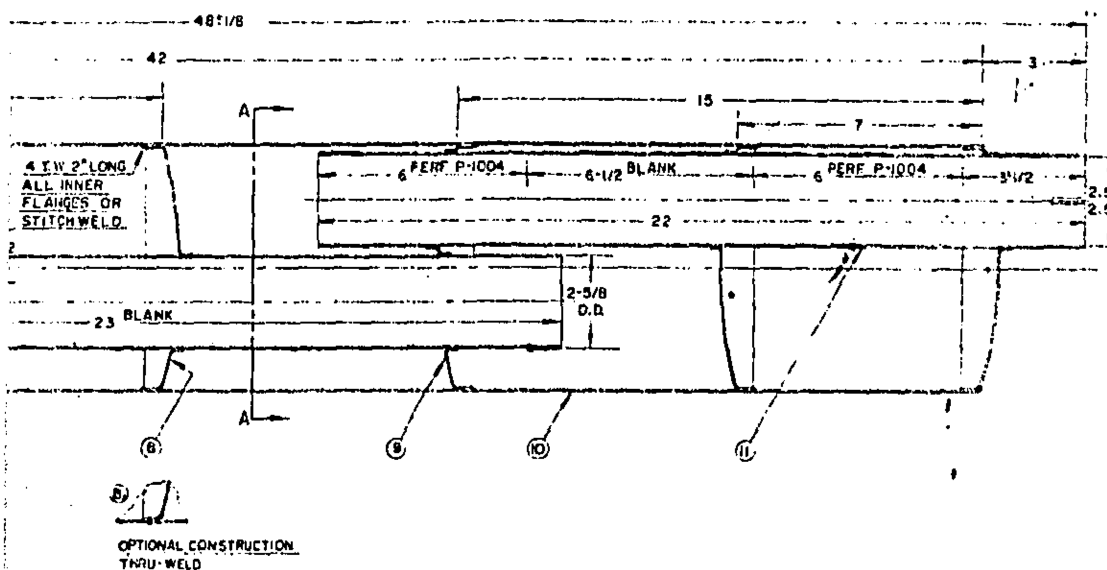


OPTIONAL CONSTRUCTION OF BODY LAPSEAM
OFFSET
NOT OFFSET
OPTIONAL BODY SEAM
4 SLOTS 1/6 X 1 BOTH ENDS
4-3/4 REF
1-3/4
18-1/2
3
16 BLANK
2.505
2.525
I.D.
6 OVERLAP
7/8
3 T.W.
7 O.D.
5-3/4
4 SLOTS IN SPARK TRAP Nº 5
2 HOLES 1-3/4 DIA IN FLANGE Nº 9
OPTION ONE 1/4" DIAMETER HANGER HOLE MAY BE LOCATED IN THE SLOTTED AREA
90°
23-1/2°
2-3/16 R
SECTION AA



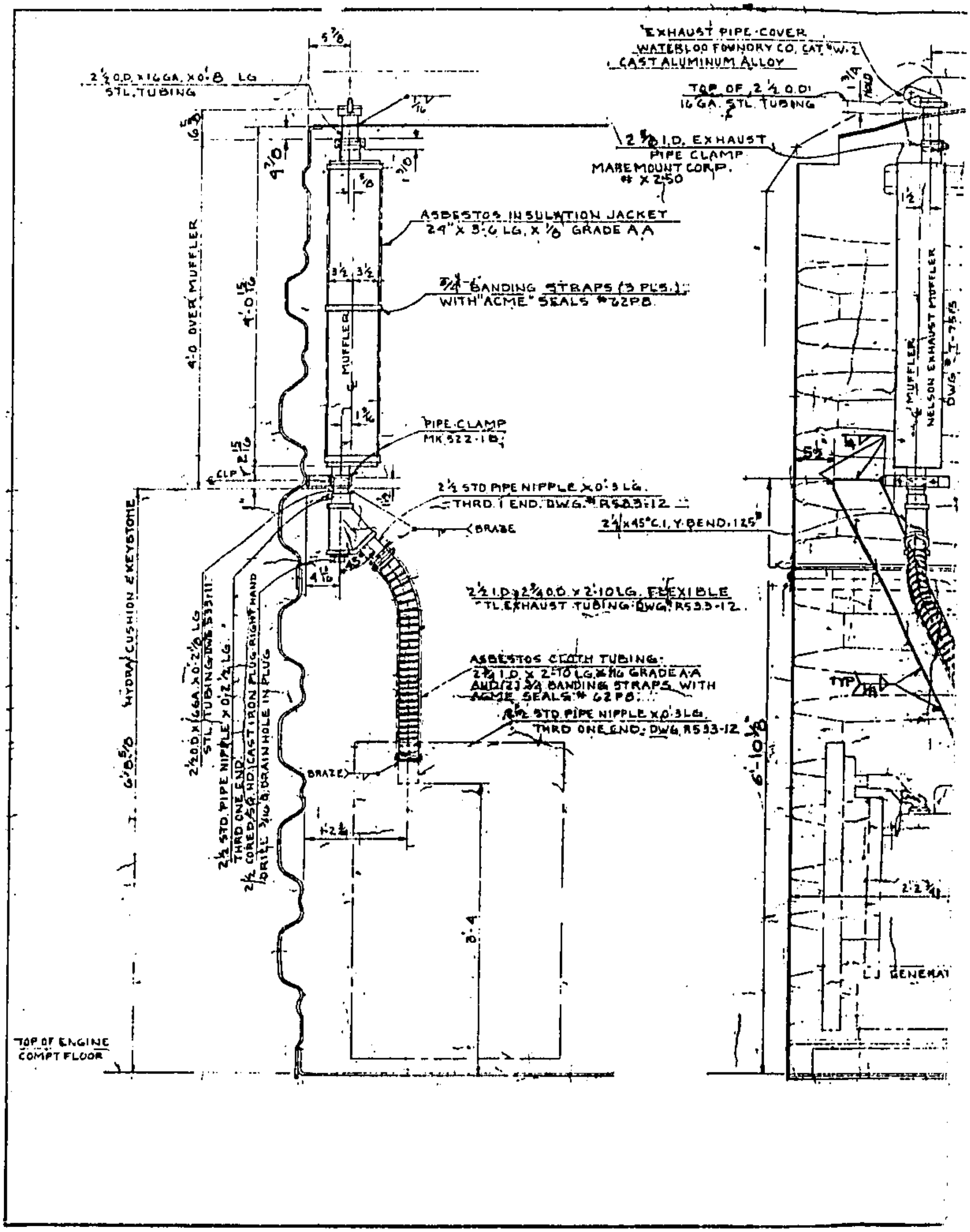
LOCATION OF BODY SEAM, TUBE JOINT, AND DRAIN HOLE MAY BE AT RANDOM ANGULAR LOCATION UNLESS SPECIFIED.
STAMP DATE OF FABRICATION ON MUFFLER.
STAMP WITH 1/4" LETTERS
T-7516
VERT. FLOW RANGE D-330 C.F.M.

				MATERIAL	SIZE
11	PERF. TUBE BJ	1	16 GA(DGO)	STEEL	[illegible] I.D.
10	BODY LS	1	"	"	7 O.D.
9	FLANGE	1	"	"	
8	"	3	"	"	
7	BLANK TUBE BJ	1	"	"	2-5/8 O.D.
6	" " "	1	"	"	[illegible] I.D.
5	SPARK TRAP	1	"	"	
4	FLANGE	1	"	"	
3	COUPLING	1/2	1" IPS	"	
2	PIPE PLUG	1	"	"	
1	SUPPORT PLATE	2	16 GA(DGO)	"	1-1/2 x 6

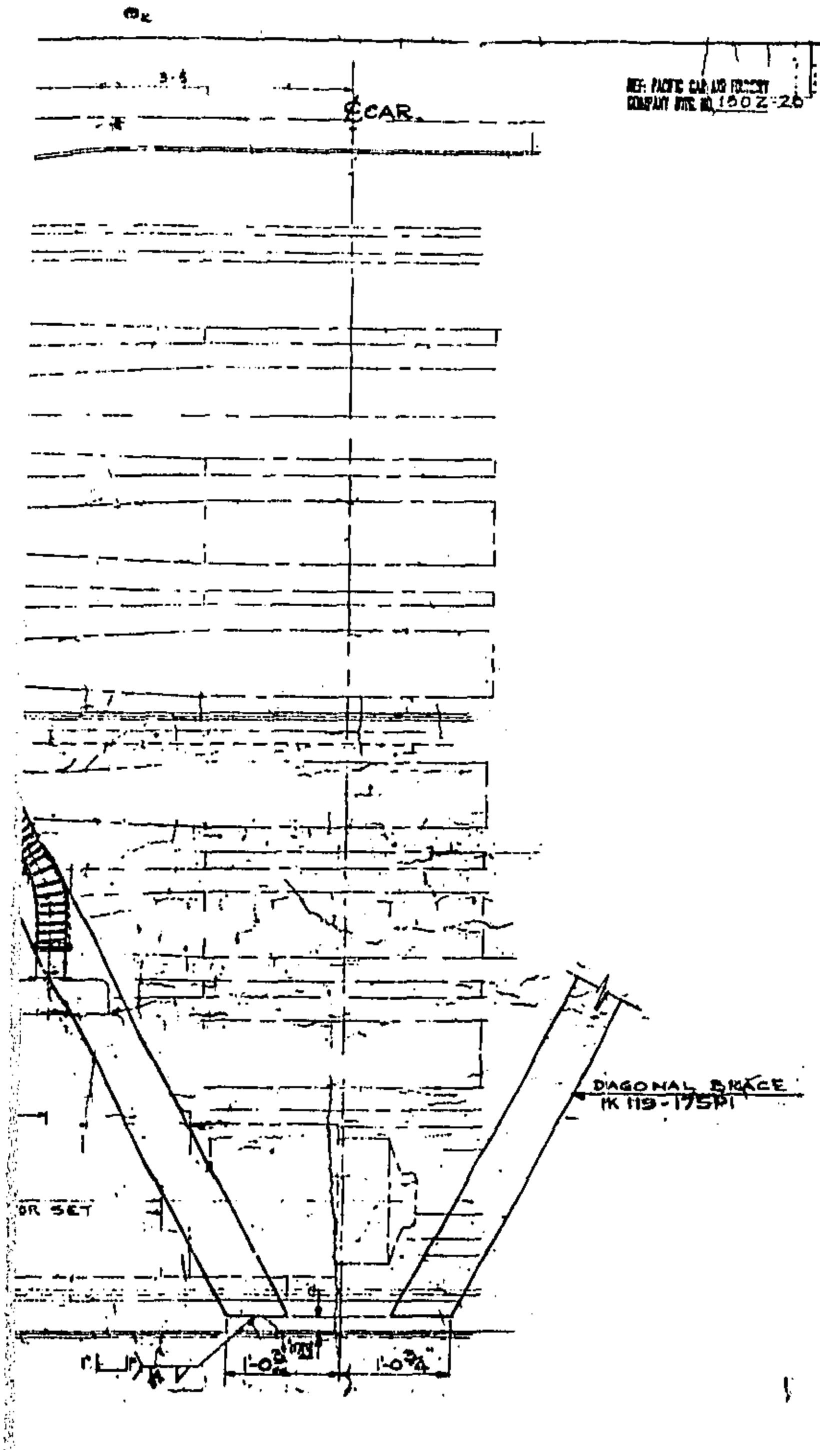
LIST OF MATERIAL

FINISH:
1 7X 273 MIDLAND ALUMINUM PAINT

STANDARD
EXHAUST MUFFLER
VERT. SPK. ARRST.
PACIFIC FRUIT EXPRESS CO
DR-7892



2½ O.D. x 16GA. x 0'-8 LG
STL. TUBING
EXHAUST PIPE COVER
WATERLOO FOUNDRY CO. CAT # W-2
CAST ALUMINUM ALLOY
TOP OF 2½ O.D.
16 GA. STL. TUBING
2⅝ I.D. EXHAUST
PIPE CLAMP
MAREMOUNT CORP.
X 250
ASBESTOS INSULATION JACKET
24" X 3'-6 LG. X ⅛ GRADE AA
4'-0 OVER MUFFLER
MUFFLER
¾ BANDING STRAPS (3 PLS.)
WITH "ACME" SEALS # 62PB
PIPE CLAMP
MK.522-1B
2½ STD PIPE NIPPLE X 0'-3 LG.
THRD. 1 END. DWG. # R533-12
BRAZE
2½ x 45° C.I. Y BEND 125#
2½ I.D. x 2¾ O.D. x 2'-10 LG. FLEXIBLE
STL. EXHAUST TUBING DWG. # R533-12
ASBESTOS CLOTH TUBING
2½ I.D. X 2'-10 LG. X 1/16 GRADE AA
AND (2) ¾ BANDING STRAPS WITH
ACME SEALS # 62PB
2½ STD PIPE NIPPLE X 0'-3 LG.
THRD ONE END. DWG. R533-12
HYDRA CUSHION KEYSTONE
6'-8 5/8
6'-10 1/8
3'-4
TOP OF ENGINE
COMPT FLOOR
MUFFLER
NELSON EXHAUST MUFFLER
GENERAT



PACIFIC FRUIT EXPRESS CO.

MUFFLER INSTALLATION

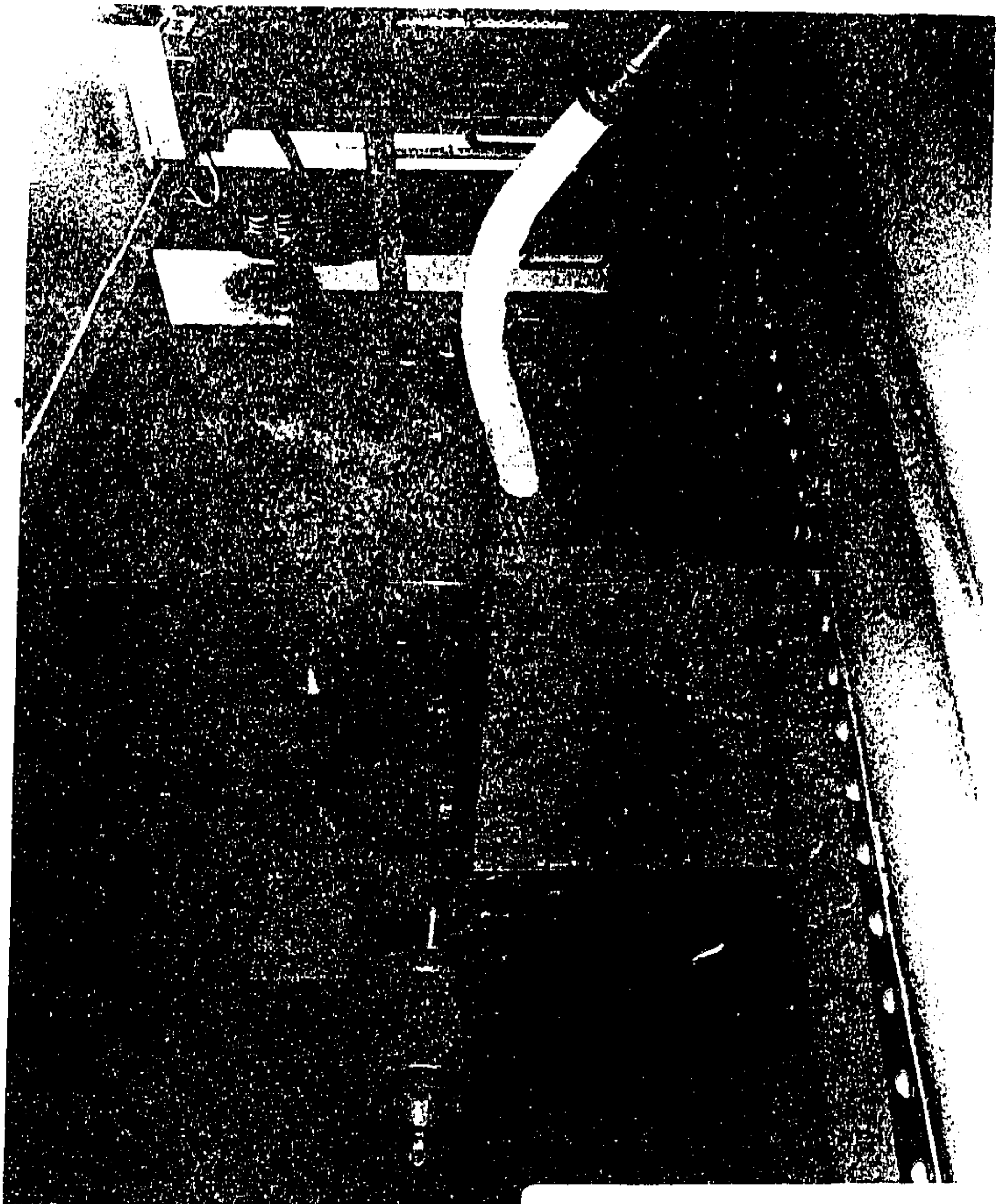
R-70-20

P.C.&F.Co. Dwg. 1502-20

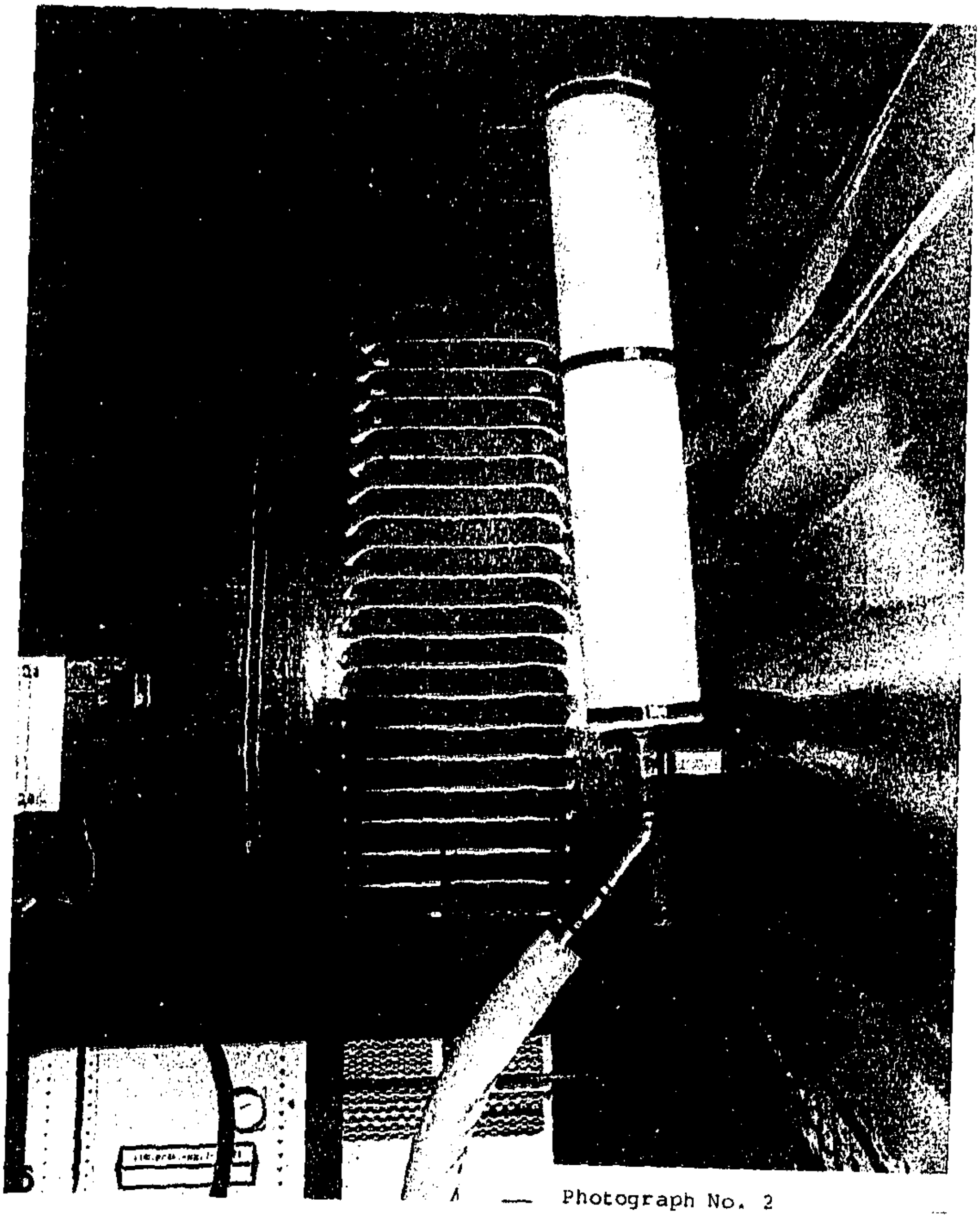
10, 1969

DR-8020

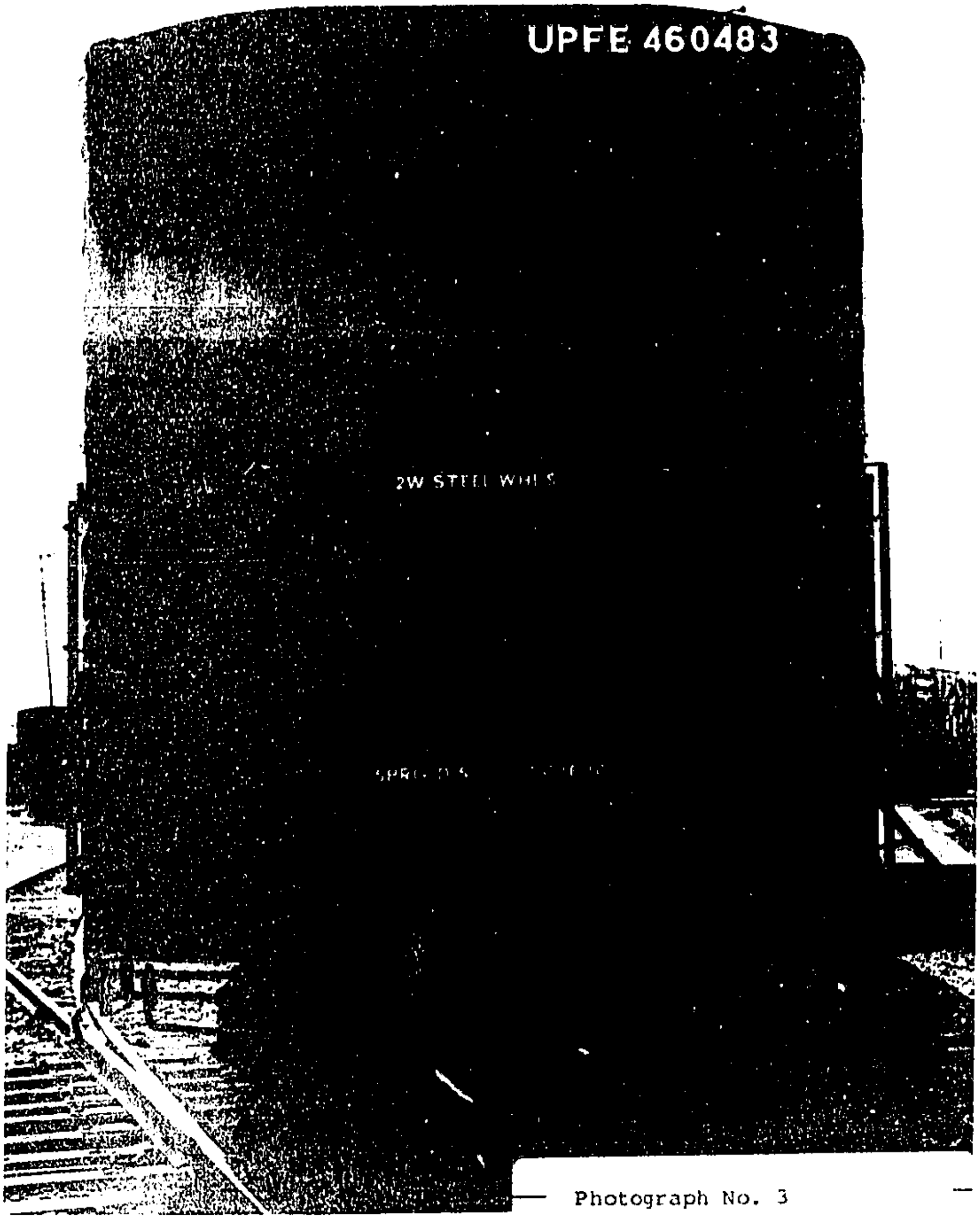
1401



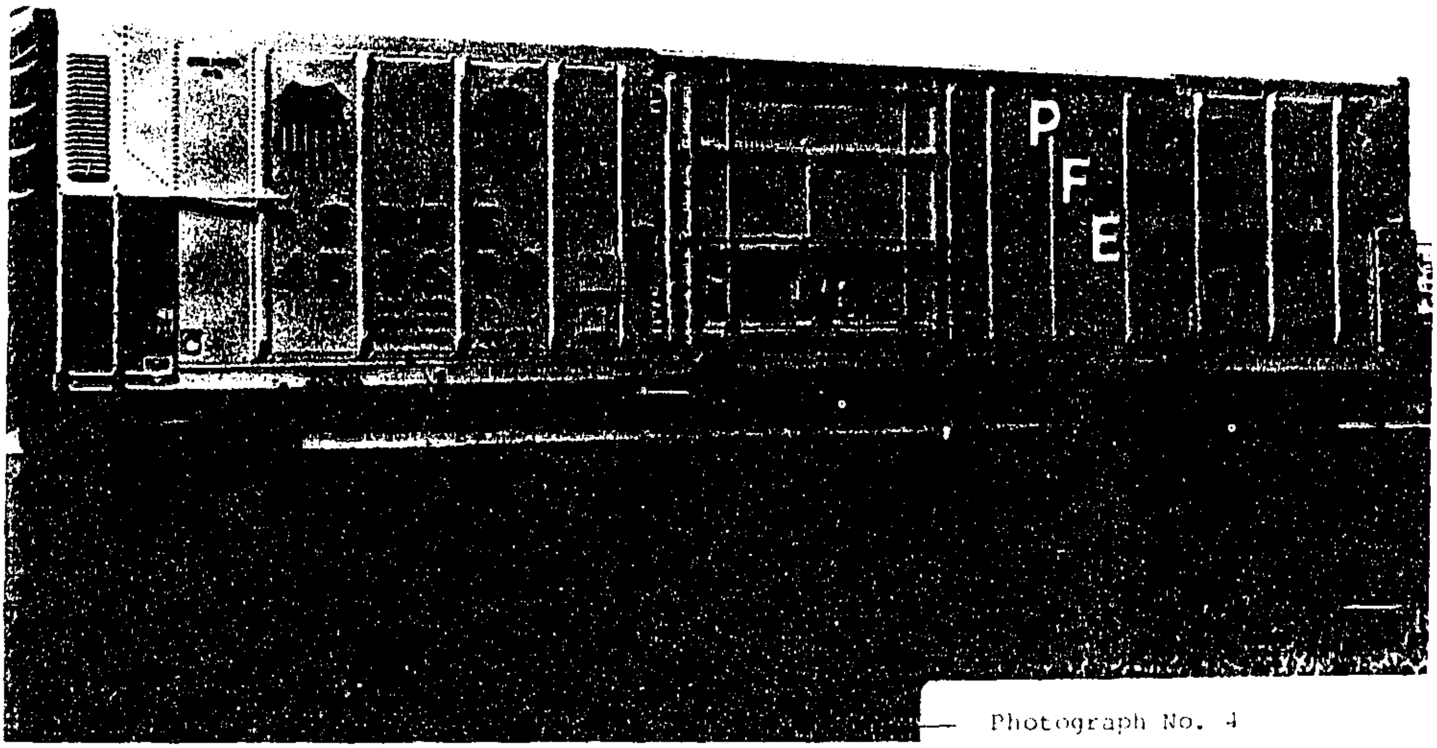
Photograph No. 1



Photograph No. 2



Photograph No. 3



Photograph No. 4

EXHIBIT K

ANALYSIS OF LOAD CELL TEST
BUILDINGS FOR NOISE CONTROL
ON
ILLINOIS CENTRAL GULF RAILROAD

by

Dan S. Krieter, P.E.
Environmental Administration Engineer

Registered Professional Engineer in
Kentucky (Registration No. 11,261)
Louisiana (Registration No. 17,902)
Wisconsin (Registration No. E-18010)

June 12, 1979

D S Krieter

This report is an engineering analysis on the effectiveness of two load cell test buildings constructed for the containment of diesel engine noise. The two buildings have very different applications insofar as noise control is concerned. The Paducah facility houses the engine only; the Woodcrest facility houses the entire locomotive.

In order to load cell test the engine at the Paducah, Kentucky facility, it must be removed from the locomotive body and rolled on a dolly into the test room. This is done in conjunction with the Illinois Central Gulf's extensive locomotive remanufacturing operations at Paducah and is not representative of most U. S. railroad shops. In Paducah, entire locomotives for both ICG and other U. S. and foreign railroads are dismantled and completely rebuilt to produce new locomotives. Accordingly, the Paducah load cell test facility was designed and constructed to be an integral part of this remanufacturing process by containing special testing equipment not usually found at most railroad shops. It is actually an acoustically designed room inside an existing shop building wherein quantitative engine tests are performed. The amount of noise reduction obtained through the use of this facility has not been quantified at this time.

The Paducah load cell test facility was constructed at a cost $300,000 in 1973. We estimate that at today's cost this facility could not be duplicated for less than $462,000. The cost for the complete load cell test building includes special construction techniques due to the confined space, and an elaborate ventilation system to provide positive interior air pressure while the engine is running in the chamber. These items are absolutely essential in the construction of an enclosed load cell test facility.

At Woodcrest Shop near Chicago, a different load cell test building was constructed. This building was designed and built to house an entire locomotive with roll down doors at each end and forced air ventilators on the roof. A separate acoustical room for the operator is also included. The cost of this facility, built in 1970, was $200,000. Adjusted for inflation, this facility would today cost approximately $416,000.

Nine years of experience with this building indicate that it has not performed effectively as a noise control measure. This is partially due to the elaborate ventilation system required to maintain positive pressure during a load test and the need to have proper exhausting of fumes. This combined noise of the roof ventilators is emitted back into the environment thereby defeating the purpose of the building.

Maximum noise emissions from a stationary locomotive occur when the locomotive is load tested in the eighth notch. Noise measurements taken at 100 feet under free field conditions, with the locomotive tested outside, revealed a maximum level of 87 db(A). According to point source propagation theory, the noise level at the Woodcrest property line can be calculated as follows:

$$L_1 - L_2 = 20 \log (r_2/r_1)$$

where L_1 = noise level at 100 ft. = 87 db(A)

L_2 = noise level at property line

r_1 = 100 ft.

r_2 = distance from locomotive to property line = 325 ft.

Solving:

$$L_2 = L_1 - 20 \log (r_2/r_1)$$
$$= 87 - 20 \log (325/100)$$
$$= 87 - 10.2$$
$$= \underline{76.8} \text{ db(A)}$$

For comparison, the noise level measured 100 ft. from the building with a locomotive being tested <u>inside</u> the building in the eighth notch was 85 db(A). This translates to a property line noise level of:

$$L_2 = L_1 - 20 \log (r_2/r_1)$$
$$= 85 - 20 \log (325/100)$$
$$= \underline{74.8} \text{ db(A)}$$

Due to the fan exhaust noise and the locomotive noise inside the building which escapes through the ventilation system, the overall noise reduction in this instance was only 2 db(A).

If the noise contribution of the ventilation fans had been known initially, the load cell test building would probably not have been constructed at Woodcrest.

In summary, while the Paducah load cell test building works satisfactorily for ICG, it is a unique situation dictated by physical conditions and is not applicable to most railroads. The Woodcrest load test building does not appear to be the most cost-effective noise control measure. The need for high volume air flow to prevent engine choking and overheating results in high air exit velocities from the building. Corrective measures for this would include additional fans or opening the roof of the building to allow greater air flow at a lower velocity; however, the doors at the building ends would require venting; and, if this work was performed, the result would be a barrier concept, not a building enclosure. The ventilation noise on the existing building adds noise back to the environment which approximately equals the reduction achieved by enclosing the locomotive. Furthermore, the operation of such a building is a highly inefficient use of electrical energy. If building were required at each facility where load cell testing is done to reduce noise emissions, the cost to ICG would be in the neighborhood of $3.5 million.

Exhibit L

BURLINGTON NORTHERN

176 East Fifth Street
St. Paul, Minnesota 55101
Telephone (612) 298 2121

ENGINEERING DIVISION

May 8, 1979

Mr. Conan P. Furber
Office of Environmental Studies, Room 620
Association of American Railroads
1920 L Street N.W.
Washington, D. C. 20036

Attention: Peter C. Conlon

Re: USEPA Railroad Noise Regulations

In regard to your telephone request to Mr. Mark Stehly of my office, we are supplying you herewith information concerning load test site enclosures. In 1971 during planning phases for our Northtown Yard, our acoustics consultant Bolt Beranek and Newman, Inc., studied and reported on the subject of load test sites. The BB and N report entitled "Noise Control Requirements for Locomotive Load Test Centers" dated July 1971 is enclosed.

This report was used for the development of architectural plans for a load test center at Northtown, Minnesota. The basic design data and cost proposal were supplied by Industrial Acoustics Company (IAC). Enclosed are copies of the architectural sketches for the proposed load test facility at Northtown and the related cost estimate work sheets. Please note that the estimate is dated 11/19/75. Also, the sketches show a gravity system for air intake; however, the concept requires a forced air fan system which was included in the IAC proposal and the cost estimate work sheets.

A problem which would have to be addressed is oil and carbon from locomotive exhaust fouling the duct work, fans and sound arrestors. This would result in a serious fire hazard and loss of air handling capacity. Any solution to the problem would no doubt further escalate the cost.

If any additional information is required, please let me know.

Very truly yours,

B. G. Anderson

B. G. Anderson
Assistant Vice President-Engineering

BTN:al10

COST ESTIMATING WORKSHEET

File No: WORK SHEET
Sheet No: [illegible] 1

Office: DESIGN OF [illegible] ENGINEERING
Date: 11/19/75
Location: ST PAUL, MINN.
Revised:
Region: TWIN CITIES Division: MINN.
Sketch Reference: ARCHITECT'S SKETCHES
Estimate of Cost for: NORTHTOWN LOAD TEST FACILITY PHASES I, II & III

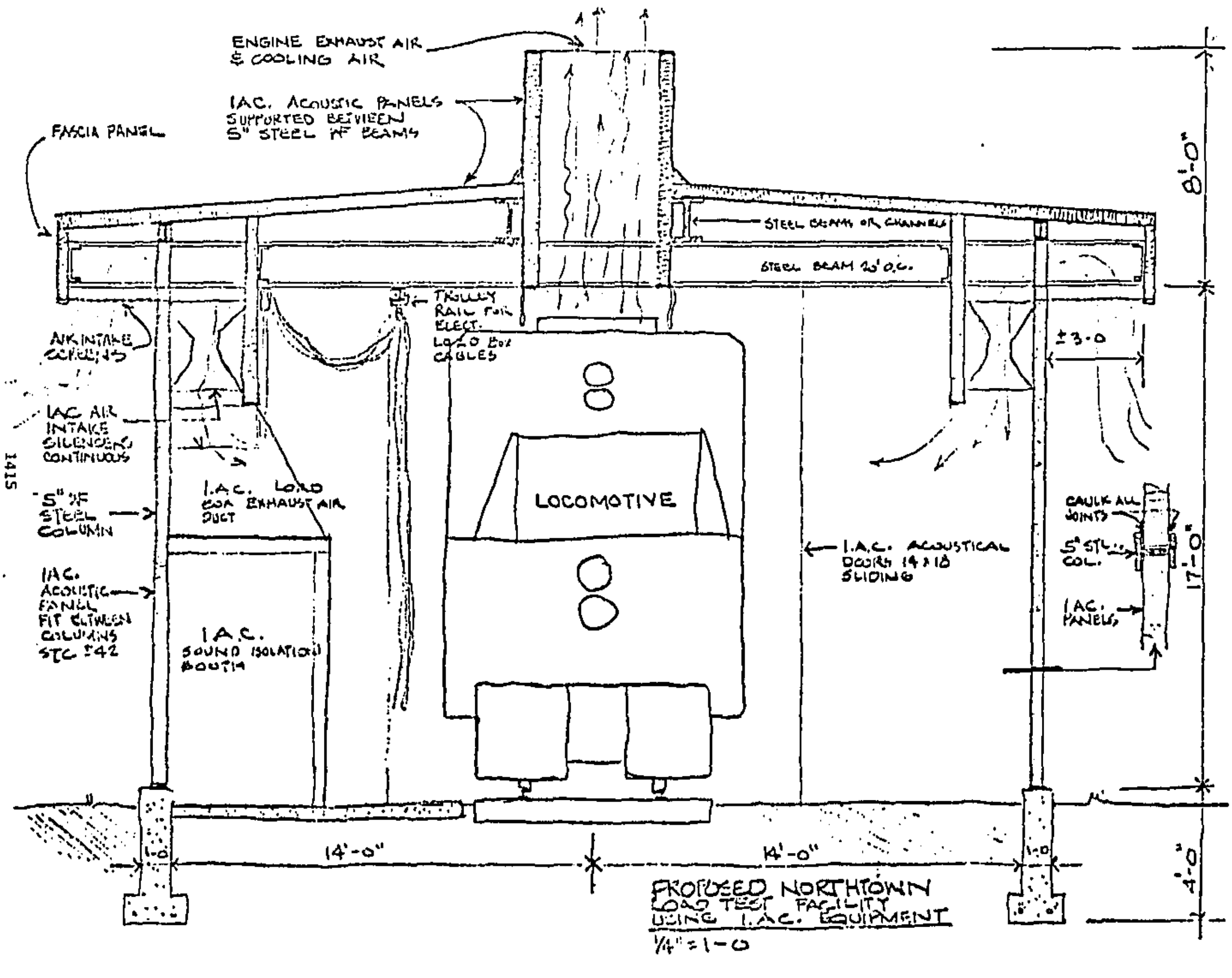
(Indicate Capital Account, Item Operating Expense, Salvage, etc.)	Quantity		Rate		Amount	
	Number	Unit	Lab.	Mat.	Labor	Material
PHASE I CAPITAL ACCOUNT						
TRACK RELOCATION		-		-	1200	300
EXCAVATION	20	C.Y.	14	16	300	350
POURED IN PLACE CONC.	15	C.Y.	40	60	600	900
WOOD CURBS	424	L.F.	60¢	60¢	250	250
STEEL STRUCTURE (BY IAC)					16400	32,160
WALLS, BOOTH, DOORS (BY IAC)					13,600	23,840
ELECTRICAL LIGHT & HEAT					8000	6000
PAINT STRUCTURE	2550	S.F.	.04	.02	100	500
PAINT WALLS	13350	S.F.	.05	.20	650	2650
TOTALS					26100	71950
1976 CONSTRUCTION ADD	20%	10%	7220	7195	43300	79150
ENGINEERING & SALES TAX	3%	4%			3600	3150
PURCHASE		6%				4750
SMALL TOOLS		3%				2300
LABOR ADDITIVES	34.37% (NOT ON IAC ITEMS)				2500	
CONTINGENCIES	5%				3000	4450
TOTAL CAPITAL					52400	93800
OPERATING ACCOUNT						
RELOCATE TRACK					1300	200
GROSS					[illegible]2100	94100
PHASE I GROSS					$	147500

File No: WORK SHEET
Sheet No: PAGE 2

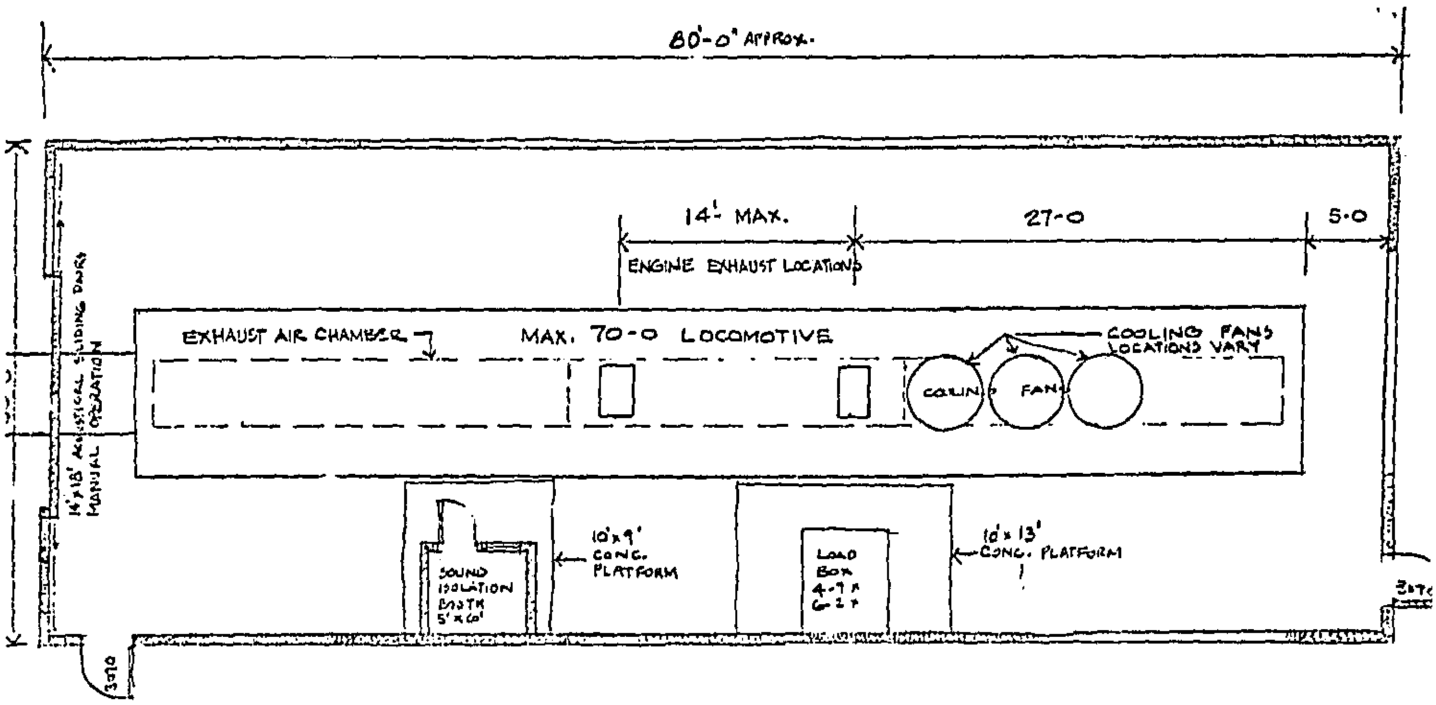
COST ESTIMATING WORKSHEET

Office: DIRECTOR OF BUILDING ENGINEERING
Date:
Location: ST. PAUL
Revised:
Region: TWIN CITIES Division: MINN.
Sketch Reference:
Estimate of Cost for: NORTHTOWN LOAD TEST FACILITY PHASE II

(Indicate Capital Account, Item Operating Expense, Salvage, etc.)	Quantity Number	Quantity Unit	Rate Lab.	Rate Mat.	Amount Labor	Amount Material
PHASE II						
CAPITAL ACCOUNT						
I.A.C. TO PROVIDE LABOR & MATERIALS FOR: ROOF EXHAUST AIR PLENUM & COOLING AIR PLENUM, FASCIA PANELS COMPLETE					17,600	26,950
1976 CONSTRUCTION	20%	10%			3500	2700
SALES TAX						1200
PURCHASE						1600
CONTINGENCY	5%	5%			1100	1600
TOTALS					22200	34050
ADD TO PHASE I						56250
TOTAL THRU PHASE II						204050
PHASE III CAPITAL ACCOUNT						
ADD I.A.C. AIR INTAKE & EXHAUST AIR SILENCERS					8,800	12,550
1976 Const	20%	10%	1700	1250	1700	1250
SALES TAX						550
PURCHASE						750
CONTINGENCY	5%	5%			500	750
					11000	15350
						26350
Total Cost through Phase III						230,400
PHASE IV	EXHAUST AIR SILENCERS				7100	12000
TOTALS THROUGH PHASE IV	1414					250000


ENGINE EXHAUST AIR & COOLING AIR
IAC. ACOUSTIC PANELS SUPPORTED BETWEEN 5" STEEL WF BEAMS
FASCIA PANEL
STEEL BEAMS OR CHANNELS
STEEL BEAM 20' O.C.
TROLLEY RAIL FOR ELECT. LOAD BOX CABLES
AIR INTAKE LOUVERS
IAC AIR INTAKE SILENCERS CONTINUOUS
±3-0
LOCOMOTIVE
I.A.C. LOAD BOX EXHAUST AIR DUCT
5" WF STEEL COLUMN
IAC. ACOUSTIC PANEL FIT BETWEEN COLUMNS STC 42
I.A.C. SOUND ISOLATION BOOTH
I.A.C. ACOUSTICAL DOORS 14 X 18 SLIDING
CAULK ALL JOINTS
5" STL COL.
IAC. PANELS
8'-0"
17'-0"
4'-0"
1-0
14'-0"
14'-0"
1-0
PROPOSED NORTHTOWN LOAD TEST FACILITY USING I.A.C. EQUIPMENT
1/4" = 1-0
1415

1416



FLOOR PLAN
PROPOSED NORTHTOWN
LOAD TEST FACILITY
USING I.A.C. EQUIPMENT
1/8" = 1-0

Exhibit M

Abex

Abex Corporation

Railroad Products Group

MAHWAH, NEW JERSEY 07430
TEL: 201-529-3450
TELEX: 01-33335

May 2, 1978

Mr. Peter C. L. Conlon
Environmental Specialist
ASSOCIATION OF AMERICAN RAILROADS
RESEARCH and TEST DEPARTMENT
1920 L Street, N.W.
Washington, D. C. 20036

Dear Mr. Conlon:

This is in connection with your letter of April 25th, 1978, addressed to our chief engineer E. E. Frank, requesting cost of retarders.

It is not possible to state a set price for retarders unless the supplier has all the necessary technical data available to ascertain the exact requirements.

However, for your consideration in estimating and analyzing retarders we furnish the following: -

1 Set (2 Units) RACOR R-2 Inert Retarders
39'-0" long - 115#RE, complete.

PRICE PER SET: .... $ 14,000.00

1 RACOR R-2 Retarder Unit converted to R-14
Hydraulic Release.

APPROXIMATE PRICE: .... $ 13,000.00

1 New R-14 RACOR Hydraulic Release Retarder,
complete, 39'-0" long - 115#RE.

APPROXIMATE PRICE: .... $ 20,000.00

Keeping in mind that these figures are purely "estimated prices", we believe they should serve your purpose, but if anything further is required, please contact me.

Very truly yours,

J. W. Meno
J. W. Meno
Assistant to Manager
Trackwork Products
Sales Administration

JWM:d

Exhibit N

WABCO WESTINGHOUSE AIR BRAKE COMPANY
UNION SWITCH & SIGNAL DIVISION
PITTSBURGH, PENNSYLVANIA 15218 • AREA CODE 412 • 242-5000

June 29, 1978

Mr. Ron Bose
American Association of Railroads
Research and Test Department
Suite 620
1920 L Street NW
Washington, D.C. 20036

Dear Ron:

I trust that you and Peter Conlon got to appreciate some of the very many subtle aspects of retarder design, application, and operation after your visit here. In the world of retarders, there are presently two rather complicated, important problems being addressed by you, the AAR, and we, a retarder supplier, noise and run-away cars. Each problem is intimately related to the other and often in opposing ways. For example, wheel lubrication may quiet retarders, but it also increases the incidence of run-away cars. It's because car retarders are a complex subject that simple questions cannot usually be given simple answers.

Confirming my comments in our telephone conversations of June 21 and June 28, is the following:

1. The cost of one lever worth of operable, weight responsive, single rail, skate retarder including installation is approximately $4,000.

2. The cost of one lever worth of inert, weight responsive, single rail, skate retarder including installation is approximately $2,000.

3. A nine lever, weight responsive, single rail, skate retarder is a typical application.

4. To give a cost for a VR-III or VR-IV is not readily possible since the speed control system is a small part of a total yard control system.

5. It can be said that the cost difference between a VR-III or VR-IV System would be small, that is insignificant compared to other considerations.

Exhibit N page 2

6. The cost to convert a VR-III yard to a VR-IV yard cannot be reasonably stated since doing such has not been fully considered.

7. We do, of course, keep detailed information on yards which we have built and installed and have less detailed information on yards built and/or installed by others. As a result, in trying to estimate yards with skate retarders versus yards without etc., I would suggest you check published data rather than go by off hand estimates.

Enclosed also is an additional supply of retarder related literature.

1. Railroad Freight Car Classification Yards 1976 - 1924.

2. Bulletin #263 Argentine Yard.

3. Bulletin #818 Typical Classyards.

4. Instruction Pamphlet U-5796, Model 50B.

5. Service Manual 6084, UR-3A.

6. Instruction Pamphlet U-5795, Model 50A.

I hope this information helps you in your important job of representing the railroads on the subject of retarder noise. If you or Peter Conlon have any questions, feel free to call. I will do my best to get them answered.

Sincerely,

Peter Noble

Peter Noble
Supervising Engineer
Mechanical Engineering Dept.

Enclosures

cc: A. J. Carey
J. W. Hansen
R. A. Hougland
R. E. Mingle
H. L. Shumaker

Exhibit O

BURLINGTON NORTHERN

Frank S. Farrell
Vice President-Law

James R. Walker
General Counsel

Harold K. Bradford, Jr.
General Solicitor

Curtis H. Berg
General Solicitor

John C. Smith
Louis A. Harris
George A. Morrison
Associate General Counsel

Peter M. Lee
William R. Power
James W. Becker
Assistant General Solicitor

Richard V. Wicka
Donald C. Knickerbocker
Barry McGrath
Robert Bartrolic
Assistant General Counsel

Nicholas P. Moros
Thomas W. Spence
Ralph S. Nelson
Alan R. Post
Leah Manning Stetzner
Shirley A. Brantingham
John D. Boettor
Attorneys

May 30, 1979

Mr. Hollis G. Duensing
Association of American
Railroads
AAR Building
1920 L Street, N.W.
Washington, D.C.

Dear Hollis:

Enclosed is a copy of the letter confirming our telephone conversation with Mr. Robin Bardwell with Gellman Research Associates, Inc. As you can readily see, our figures, which are supportable, greatly exceed EPA estimates to date.

Transportation is becoming a problem but I hope to see at the meeting scheduled for June 5.

Sincerely,

Ralph S. Nelson

Ralph S. Nelson

RSN:gwd;20

RECEIVED
JUN 4 1979

Exhibit O -3

REC'D LAW DEPT

MAY 29 1979

BN ST. PAUL

May 24, 1979

Mr. Robin Bardwell, Associate
Gellman Research Associates, Inc.
910 17th Street N.W. - Suite 524
Washington, D.C. 20006

Dear Mr. Bardwell:

It was a pleasure talking to you today about the costs and problems associated with noise control at retarders in railroad yards.

I would like to briefly outline the items we discussed on the phone. Rather than go into a long narrative, I will put it in outline form.

I - Experimental - not proven -- still have problems.
- A. Other measures also may have helped.
  - 1. Distance.
  - 2. Berms.
- B. Winter - not dependable for sprays - slush.

II - Some estimates are very rough due to time - identified which.
- A. New yards - one matter (Northtown) new design.
- B. Old yards - another matter - try to retrofit.

III - Costs (Northtown)
- A. Spray system.
- B. Sound barriers.
- C. Extra retarder length.
- D. Maintenance and operating costs (oil and glycol, labor, etc.)
- E. <u>Other</u>
  - 1. Treating plant (environmental problems).
  - 2. More track length.
  - 3. More land cost.
  - 4. More grading.
  - 5. Higher hump, more resistance, more power, etc.
  - 6. Berm.

IV - Additional costs - older yards.
- A. Most likely require redesign and rebuild hump end.
  - 1. Almost impossible in some places.
  - 2. Intolerable yard operation delays.
  - 3. Cost - \$10 - \$20 million guess
  - 4. If manual control (not computer) the system may not work (retarder pressure control cannot be varied).
  - 5. Land and relocation costs.
    - a. Tower.
    - b. Buildings.
    - c. Industry.
  - 6. Rehabilitate retarders in order to relocate.
- B. Environmental effect of this (cure worse than illness).

V. Inert Retarders

A. EPA estimate way off.

B. Requirements.

1. Present type ? Some can be modified - some necessary to replace.
2. Control in hump tower required - not at retarders.
3. $40,000/track is a good guess - could be $35,000 or $50,000/trk.
4. Safety is paramount.

I hope my cryptic notes will be sufficient to refresh your memory on our discussion. If not, feel free to call and check on my memory.

I am also attaching a sheet prepared by Murray Walker containing the information he gave you regarding costs. I am certain you are aware of the emphasis we placed on the fact that these costs are certainly not all-inclusive and are very likely only a fraction of the cost that would be involved in attempting to retrofit existing yards with sound barriers and retarder spray system. We have made a rough check on the numbers of cars that have come through the system. The yard just started operation in 1974 so we have no car count for that year, but total cars humped as follows:

* 1975	- total cars humped	659,482
1976	"	756,212
1977	"	776,939
1978	"	783,789

* Yard not completed

I want to express my appreciation for giving us the opportunity to provide you with the information you asked for. It is a pleasure to work with someone who is actually getting the facts instead of trying to guess at them. I look forward to talking with you again some time in the future.

Yours truly,

D. V. Sartore
Chief Engineer Design

bcc: Mr. B. G. Anderson
Mr. R. S. Nelson
Mr. G. W. Thompson - Attn. Murray Walker
Mr. J. D. Giallombardo - Attn. Bernie Noone

DVS:mm
Atts.

EXHIBIT 9

STATEMENT OF W. V. WILLIAMSON

My name is W. V. Williamson, and I have been employed by the Southern Pacific for 36 years, 23 of which were in actual terminal operations as a switchman, yardmaster, and terminal officer in Los Angeles. The last 13 years have been spent in system headquarters at San Francisco, where I have system responsibilities in terminal operations and evaluation of terminal operations. My responsibilities also include design and implementation of major yard facilities, such as the hump yard at West Colton, California.

The AAR requested that I furnish a narrative account of why it is practically impossible to change railroad operations in order to comply with the proposed Ldn standard, a standard which artificially penalizes nighttime noise by ten decibels. This statement is intended to serve that purpose.

The EPA has suggested in its Background Document that curtailment or elimination of the third trick of railroad yard operations might be a viable alternative to achieve compliance with the standard when all other noise-attenuating measures fail. This suggestion reflects a lack of knowledge or understanding of the realities of railroad operations. Unlike other modes of transportation, railroad facilities must be operated around the clock, 7 days a week, 365 days a year. The necessity of around-the-clock operations arises from both the needs of the shippers serviced by the railroads and the very nature of the railroad plant which requires maximum utilization of limited equipment and fixed facilities.

Even to attempt such an undertaking unless restricted to certain very isolated situations, would have a severe and devastating impact on railroad yard operations and rail-serviced industry alike.

At the outset, it should be understood that the time frames in which railroads perform terminal and other operations are dictated almost entirely by shippers' needs and by local, state and federal regulatory bodies. Very little, if any, is determined by railroad convenience.

The typical way in which railroads serve industry is to pull cars from industrial plants on the afternoon shift or nighttime hours after the plants have closed and then to take those cars to train yards for switching and entrainment on the midnight and first half of the day shift. Cars going to industry are switched and lined up on the last half of the day shift and on the afternoon shift and are then delivered and spotted on the midnight shift. Examples of some of these industries are: perishable fruits and vegetables packing houses, light manufacturing plants, produce terminals, retail sales outlets, chemical and petroleum distributing outlets, warehouse operations, retail automobile distribution centers, and other such eight- or ten-hour-a-day commerical operations.

A typical example of switching requirements where shipper production is accomplished during the day and early evening hours and where the switching for pickup of loaded cars and spotting of empties, as well as the making up of trains is accomplished during the night and early morning hours is the perishable fruit and vegetable industry.

Throughout the agricultural regions on the Southern Pacific, the fresh fruit and vegetable industry conducts its field harvest operations during the early daytime hours then packs the produce and loads the cars throughout the day and early evening and finally the cars are switched from the packing sheds and marshaled into trains during the nighttime hours for expedited movement east. Usually cars are placed at the packing sheds on adjacent drill tracks, often four tracks deep, and loading takes place first into the cars on the outer drill tracks through the open doorways of the empty cars on the inner drill tracks and progresses to the inner cars as the outer car loading is completed thereby precluding switching of cars until all loading is completed. This is true throughout every principal crop growing region on Southern Pacific lines and cannot be readily altered because of the perishable nature of the product and the necessary flow through requirements of the packing sheds and precooling rooms and equipment.

There were over 62,000 carloads originating in 1977, and over 45,000 carloads originating in 1978 on Southern Pacific lines alone that fall into this category of switching service requirements.

Of course, there are exceptions to this pattern. Some large industries work two and three shifts a day and seven days a week, and require spotting and pulling on any shift. Examples of such industries on Southern Pacific Lines are: Automobile Assembly Plants, Freight Forwarders, Trailer on Flat Car (TOFC) Operations, Steel Fabrication Plants, Mail Handling Facilities, Breweries, Petroleum Refineries, Canned Food Processing Plants, and Heavy Manufacturing Plants. Some of these operations such as Automobile Assembly Plants because of the volume of freight and number of railroad cars involved, may require plant freight car switching and classification each and every shift of operation, as well as closed shift hours.

A typical example of where nighttime, as well as daytime switching is necessary is at the General Motors Plant at Fremont, California. This plant operates two 9 1/2 hour shifts a day. Approximately 100 carloads of production material are switched into the plant each day. During these switching operations, empty cars must be removed from the plant, as well as loaded cars switched into the plant. After the loaded cars are switched into the plant, unloading takes place throughout each shift virtually moving the material from the cars to the production lines. Because of the two shift operations, approximately half of the switching must by necessity be performed during the plant's nighttime hours.

In addition to the 100 railroad carloads of production materials into the plant daily, approximately 60 railroad autorack cars are switched into and out of the plant throughout each day's production for the transportation of new autos from the plant. Similar Southern Pacific railroad switching operations are also in effect at two General Motors plants in the Los Angeles area.

A very large majority of shippers work days and need to be serviced by railroads while they are closed. This is true, for example, in the lumber milling industry where the loading of lumber takes place on the same trackage and in the same lumber storage areas as where the empty cars are spotted for the next day's loading and from which the loaded cars are pulled to the train yards for yard switching and entrainment. It simply would not be possible to perform in-plant switching during lumber loading operations, therefore, by necessity it must be performed after the plant closes into the hours of the second or third shifts.

Also train arrivals and departures at yards and car classification tracks also take place around the clock. An example of this is Southern Pacific's Los Angeles, California, hump yard. The average days switching capacity of this yard is approximately 2,200 cars. The average through-put is in the range of 1,800 to 2,500 cars per day. In addition, the switching facilities (hump) must be used for both inbound and outbound switching. The physical capabilities of the switching facility are capable of producing about 700 cars per 8-hour shift; consequently, any significant reduction in any one shift would result in an immediate back up of cars that would soon bring the entire railroad system to a halt. It is not possible to depart and arrive all trains during the first and second shifts. Distance to travel and the Federal Hours of Service Act have a very definite bearing here as does the fixed physical capacity of our plant. It simply is not physically possible to handle all of our activities in a 16-hour day either on the main line or in terminals, nor is it practical to even consider doing so. Even assuming that the vast dislocation to the nation's industry could be worked out (no one being serviced at night), we do not have the tremendous capital funds to expand the nation's railroad capacity by at least one-third to one-half to compensate for the curtailment of nighttime operation. Furthermore, it is not physically possible to expand land-locked facilities in our major cities.

The railroad themselves would gladly operate two shifts a day or even one for economic reasons if it were practical to do so. Night operations are the most difficult because of darkness and because of the human dislike of working nights. This in itself makes nighttime operations less desirable. Whenever possible, the industry does curtail nighttime operations; but these instances are almost in isolated low volume operations. Whether we like it or not, railroads must operate 24 hours a day to fulfill their responsibilities.

Another item to consider is the equipment shortages and utilization problems that continually plague the industry and shipping public and in which federal agencies, such as the Interstate Commerce Commission, are constantly and actively involved with regulations to improve efficiency in car handling that are not compatible with a two-shift operation. It certainly would not help to compound this already serious problem by discontinuing operations during a ten-hour period at night. This would not have just a one-for-one effect on car detention, but would be compounded into major disruptions in the longer schedules.

Finally, I believe that restricting operations to two shifts a day would have a detrimental effect on railroad labor since much of their earnings are predicted on agreements covering a three-shift day. A case in point is switchmen in terminals who have a contract that calls for time-and-a-half pay for a second shift worked in a calendar day. As an example, a man may work from 7:59 a.m. to 3:59 p.m. at straight time and then work form 11:59 p.m. to 7:59 a.m. at time and a half. Many, many such shifts are worked and are the basis of take-home pay standards for individuals. This would not be possible if there were no third shift.

In closing, I would like to repeat that the railroads themselves would implement a two-shift operation if it were possible. In practically all instances, it is not. An attempt was made by SPTCo. in the recent past for efficiency and economic reasons to reduce the Los Angeles hump yard to a two-shift operation. The theory was that the activities of the other two shifts could be speeded up and scheduled in such a way as to handle all cars on a two-shift basis. This effort was never successful simply because the facility could not produce 24 hours of work in 16 hours. The irregularity caused by the break in production flow caused such inefficiencies that the second shift was regularly working four hours overtime, and delays to cars became intolerable. Because of this, we soon went back to a three-shift operation.

While we have not quantified the results of the Los Angeles experiment, we do know that from the standpoint of serving the customer and keeping the terminal fluid that the experiment did not work.

Operating a two-shift railroad would, in my considered opinion, based on my experience and knowledge about railroad operations, result in:

(a) A major disruption to the shipping public, most of whom need 24-hour service;

(b) A major decline in equipment utilization requiring the addition of new cars and locomotives to make up for lost cars days;

(c) A major congestion of rail facilities with eventual shutdown of all operations due to fixed capacity of yards;

(d) A major shift to other modes of transportation; and

(e) A major impact on rail labor.

W. V. Williamson

W. V. Williamson
Manager Operations & Terminal Systems
Southern Pacific Transporation Company
San Francisco, California

CONRAIL

Exhibit R

July 25, 1978

Hollis G. Duensing, Esq.
Association of American Railroads
Law Department
American Railroads Bldg.
Washington, D.C.

Dear Mr. Duensing:

This refers to your letter of July 5th, requesting certain questionnaire information concerning classification yards and a narrative discussion relative to industrial yards.

The questionnaire is attached. It indicates conclusively that any restriction on classification activity could not be absorbed at the same or other yards.

As mentioned at our meeting in Washington, Conrail employs yard crews at 338 locations. 175 of these have 3rd trick crews regularly assigned. 15 of these are major yards significantly oriented towards classifying cars beyond their immediate retail serving territory. In other words, at approximately 160 of the locations where we work crews on the 11 P.M. to 7 A.M. shift, the prime purpose is to directly accomodate customer rail service requirements.

The continuous operation of the railroad including yard switching operations has existed ever since the headlight was invented, i.e. almost from the beginning. The general pattern of industrial growth and hours of plant operation followed the growth of the 24 hour railroad network. The basic service structure was (and still is in large degree) for today's loads to be pulled and forwarded tonight. (Your category 1) Tomorrow's raw material is placed in the early A.M. - perhaps just after arrival. (Your category 2)

To feed production, large rail oriented industries working two shifts require almost continuous switching service. Those that work around the clock do so absolutely. Some industries such as produce terminals are early morning operations themselves. Others require car placement during the night to provide work for casual labor such as meat-cutters or warehouse labor. This force is engaged day by day on the premise that specific cars will be available tomorrow. This force will be paid for nothing if the cars are not available to unload. The traditional evening release - early AM placement has returned to particular vogue with the advent and growth of the piggyback trade. The entire service pattern of this major rail business segment is based upon evening loading and dispatch coupled with early morning arrival and unloading. The alternative is the truck traveling thru the night.

Examples of industries depending absolutely upon night time rail service are several:

Automobile assembly plants - evening and early morning inbound rail cars are a sine qua non of keeping the production line from going down. Alternative premium transportation is possible as a short term stop gap only. I attach typical switching schedules for two auto related facilities with which I am familiar, the Willow un auto loading dock, the GMAD Willow Run assembly plant, the Olds main plant at Lansing (both an assembly and a parts manufacturing plant).

Steel mills - continuous operation of blast furnaces, open hearths, rolling mills, basic oxygen furnaces and the like require rail support at all times, either the road haul carrier, the plant switching road or some combination of each. Examples on Conrail are the Bethlehem Burns Harbor in plant, Great Lakes steel at Trenton, Mich Midwest steel at Portage In, and several other and even larger mills.

Produce markets - Conrail serves several major rail produce unloading market terminals notably at Baltimore, Philadelphia, Pittsburgh, New York and Boston. These markets require by trade custom and regulatory Fiat to be protected by a published early morning placement. In this connection see Page 4 of TL-CTR freight tariff 841 ICC C-1182 copy attached.

Major rail oriented industries - Many large manufacturing industries require dedicated switch engine service on a continuous basis because their plants must have an ongoing flow of loaded and empty cars to survive. I am personally familiar with the cereal mill operations at Battle Creek, where there is a committed crew working from 11:30 P.M. to 7:30 A.M., for the exclusive purpose of serving the Kellogg cereal plant. This crew switches continuously thru the night between the serving yard and the Kellogg complex. A similar dedicated 3rd trick crew serves the Post Division of General Foods. A like situation obtains at Mehoopany, Pa, where continuous coverage of Proctor and Gamble's Charmin paper plant is provided. These assignments are indicated on the attached Lehigh Division list of local freights. Although nominally locals, the Charmin jobs are yard engines for practical purposes, and exist to serve around the clock at the industry. Neither Battle Creek or Mehoopany is unique.

The industrial support acitivty of many yards involves making up local freight trains for daylight operation during the 11 P.M. to 7 A.M. shift. In this connection, I attach a sample portion of the local freight train schedule book showing local freight trains emanating from Rutherford and

Pavonia, with a heavy concentration of daylight departures.

Night time industrial switching activity is a necessity to serve many patrons in urban core areas where vehicular congestion precludes train operation during daylight hours. This is part of the service at several locations on Conrail, notably at Baltimore, Philadelphia, Newark and Jersey City. The prohibition against daylight switching may be by ordinance curfew or simply a practical operating matter.

At locations along the Northeast Corridor and in commuter areas, freight, local, transfer and industrial crews cannot traverse passenger main tracks except at night.

Essentially, the railroad provides warehoused inventory on wheels. This inventory must be available when either continuously for large rail transportation users or before the work day in the case of other major patrons. Those customers whose rail service requirements can be met exclusively by daylight mid-shift service are usually the smaller or less service sensitive concerns or those who use other than rail transport for most of their needs.

The consequence of interdicting night time service in whole or in part would be widely disruptive of major industry (chemical, steel, auto, paper, food products, warehousing, coke, power plants ad infinitum) to the point where the nation's economy would be on its knees the day after implementation. An absurd extension of the effects would require a tripling of the customer portion of the freight car cycle:

Daylight Day 1	Place car for Day 2's use
Daylight Day 2	Unload Car
Daylight Day 3	Pull car after prior days unloading

The inflationary impact of trying to cope with a few decibels is beyond imagining. Taking the word "environment" in its widest context, shutting off the arteries of rail commerce during darkness would do nothing for the quality of human life.

Sincerely,

John B. Hitchcock
Director - Terminal Planning

cc: Mr. Daniel F. Donovan
Commerce Counsel - 1138

Mr. E.T. Harley
Director - Operations Technology - 950

DIVISION [illegible] February 10, 1978
JACKSON, MI.

FEB [illegible] 1978

FILE No.

File 90-DEW
Switching

Mr. H. Paxson, Trainmaster
Consolidated Rail Corporation
2575 Ecorse Road
Ypsilanti, Michigan 48197

Dear Sir:

Please be advised that effective February 13, 1978, GMAD Willow Run will require switching at the following times:

	Switch List to ConRail By	Switch Time
Tracks 17 & 18		
	11:00 p.m. (prior evening)	1:30 a.m. - 5:00 a.m.
	6:15 a.m.	9:00 a.m. - 9:30 a.m.
	10:30 a.m.	1:30 p.m. - 3:30 p.m.
	5:30 p.m.	8:00 p.m. - 8:30 p.m.
Tracks 19, 21, 22 & 23		
	11:00 p.m. (prior evening)	1:30 a.m. - 6:00 a.m.
	7:30 a.m. (as required)	10:30 a.m. - 11:00 a.m.
	10:00 a.m.	3:00 p.m. - 4:00 p.m.
	5:00 p.m. (as required)	8:00 p.m. - 8:30 p.m.

On the Body Side, Track 17 has priority over Track 18 and Track 23 has priority over Track 19 on the Chassis Side.

Very truly yours,

J. D. Lyons
Traffic Manager

By: [signature]
D. E. Waybrant
General Supervisor

/d
cc: Mr. J. Fraser, ConRail - Jackson
Mr. A. Duncan, ConRail - Jackson
Mr. A. Carriere, Material Director - Willow Run

February 16, 1978

File 90-DEW
Switching

Mr. M. Paxson, Trainmaster
Consolidated Rail Corporation
2575 Ecorse Road
Ypsilanti, Michigan 48197

Dear Sir:

Please be advised that effective Tuesday, February 14, 1978, GMAD Willow Run will require switching at the carloading dock at the following times:

1:00 a.m.	-	5:30 a.m.
6:30 a.m.	-	7:00 a.m.
10:00 a.m.	-	10:30 a.m.
1:00 p.m.	-	4:00 p.m.
6:00 p.m.	-	7:00 p.m.

Very truly yours,

J. D. Lyons
Traffic Manager
By: D. E. Waybrant
D. E. Waybrant
General Supervisor

/d ✓
cc: Mr. J. Fraser, ConRail - Jackson
Mr. A. Duncan, ConRail - Jackson

DIVISION SUPERINTENDENT
JACKSON, MI.
FEB 17 1978

FILE NO.....................

FISHER BODY DIVISION

GENERAL MOTORS CORPORATION

LANSING PLANT

LANSING, MICHIGAN 48904

DATE: NOVEMBER 17, 1977

SUBJECT: PLANT SWITCHING SCHEDULE

FROM: D. P. LEONARD

TO: MR. L. D. MAILAND

We have notified Consolidated Rail Corporation of our changes (*) in schedules effective November 21, 1977. The track release times and the required set-up times are as follow:

	SWITCH ORDER TO BE CALLED TO R R BY	START SWITCHING PLANT	REQUIRED SET-UP	TRACK SWITCHING SEQUENCE
	11:15 P.M.	3:30 A.M.	6:30 A.M.	8
	11:15 P.M.	3:30 A.M.	6:45 A.M.	7-5-3-4
	8:00 A.M.	10:45 A.M.	11:15 A.M.	8
	8:30 A.M.	11:00 A.M.	11:30 A.M.	7
	8:30 A.M.	12:00 NOON	12:30 P.M.	5-4-3
(*)	12:00 NOON	3:45 P.M.	4:30 P.M.	8
(*)	12:00 NOON	4:00 P.M.	4:45 P.M.	7-5-3
(*)	6:00 P.M.	8:45 P.M.	9:15 P.M.	8
(*)	6:00 P.M.	9:00 P.M.	9:30 P.M.	7
(*)	6:00 P.M.	9:30 P.M.	10:00 P.M.	5-3

D. P. Leonard
Traffic Manager

By: Terry L. Rouse
Terry L. Rouse

cc: G. W. Figg (3)
W. G. Faull (3)
T. L. Rouse (2)
J. Harvey
R. A. Rosen
L. R. Boerma
J. Stowell
T. Miles, TM-CR-Lansing
Yardmaster, CR-Saginaw Yard
J. A. Fraser, Div. Supt., CR-Jackson
A. Duncan, Asst. Supt., CR-Jackson
J. Spaulding, Tech. Ctr. - Traffic
R. Hatfield, GM Logistics

ITEM	SUBJECT	APPLICATION		
		VIA CHICAGO		DAY
800	Schedule of freight trains handling fresh perishable commodities between points on CR -CARLOAD SERVICE	Cars received by Indiana Harbor Belt Railroad prior to	3:00 AM	0
		Cars received at Blue Island Yard, Riverdale, Ill. prior to	4:00 AM	0
		Will be available on team track at Eastern Markets, except Saturdays, Sundays and Holidays, as follows:		
		New York, N.Y. (Hunt's Point Market)	6:00 AM	2
		Philadelphia, Pa. (Conrail Produce Terminal)	6:00 AM	2
		Pittsburgh, Pa. (Conrail Produce Terminal)	5:00 AM	2
		Buffalo, N.Y. (Niagara Frontier Food Terminal)	6:00 AM	3
		Cars received by Indiana Harbor Belt Railroad prior to	1:30 PM	0
		Cars received at Blue Island Yard, Riverdale, Ill. prior to	2:30 PM	0
		Will be available on team track at Eastern Markets, except Saturdays, Sundays and Holidays, as follows:		
		Boston, Mass. (New England Produce Center)	5:00 AM	3
		Baltimore, Md. (Conrail Produce Terminal)	6:00 AM	3
		Washington, D.C. (Union Market)	3:00 AM	3
		VIA ST. LOUIS		
		Cars received at Rose Lake Yard, E. St. Louis, Ill. prior to	12:01 AM	0
		Will be available on team track at Eastern Markets, except Saturdays, Sundays and Holidays, as follows:		
		Boston, Mass. (New England Produce Center)	5:00 AM	3
		New York, N.Y. (Hunt's Point Market)	6:00 AM	3
		Philadelphia, Pa. (Conrail Produce Terminal)	6:00 AM	3
		Baltimore, Md. (Conrail Produce Terminal)	6:00 AM	3
		Washington, D.C. (Union Market)	3:00 AM	3
		Pittsburgh, Pa. (Conrail Produce Terminal)	5:00 AM	3
		Buffalo, N.Y. (Niagara Frontier Food Terminal)	6:00 AM	3
		VIA POTOMAC YARD		DAY
		Cars arriving Potomac Yard, Alexandria, Va. prior to	12:01 AM	0
		Will be available on team track at Eastern Markets, except Saturdays, Sundays and Holidays, as follows:		
		Boston, Mass. (New England Produce Center)	12:01 AM	3
		New York, N.Y. (Hunt's Point Market)	6:00 AM	2
		Philadelphia, Pa. (Conrail Produce Terminal)	6:00 AM	2
		Baltimore, Md. (Conrail Produce Terminal)	6:00 AM	2
		Washington, D.C. (Union Market)	3:00 AM	2

NOTE:

These schedules do not apply to cars which are diverted or reconsigned enroute. When shipping instructions require refrigeration or heater attention enroute, schedules will be 24 hours longer than shown above.

(Continued)

LEHIGH DIVISION 4-1-76

ORIGIN	TRAIN	LEAVE	FREQUENCY	TO	ARR. TIME
HIGH BRIDGE	HBL-1/2	0800	DE SAT/SUN	RARITAN/PHILLIPSBURG & RETURN	
ITHACA	IL-1	0830	DE SUN	LUDLOWVILLE & RETURN	

DEDICATED CHARMIN ENGINES

ORIGIN	TRAIN	LEAVE	FREQUENCY	TO	ARR. TIME
MEHOOPANY	CH-2	0359	DAILY	LACEYVILLE/TUNKHANNOCK & RETURN	
	CH-1	0759	DAILY	LACEYVILLE/TUNKHANNOCK & RETURN	
	CH-2	1159	DAILY	LACEYVILLE/TUNKHANNOCK & RETURN	

↓DRILLS PRODUCT TRACK AT 6[illegible]

ORIGIN	TRAIN	LEAVE	FREQUENCY	TO	ARR. TIME
PHILLIPSBURG	1401/1402	0815	DE SAT/SUN	PT. MORRIS & RETURN	
	BL-25/26	1100	DE SUN	MILFORD & RETURN	
	PL-16/15		AS NEEDED	MARTINS CREEK & RETURN	
	BL-32/31		AS NEEDED	BELVIDERE & RETURN (WORKS PP&L)	
PITTSTON	CW-2	1000	DE SAT	WILKES BARRE & RETURN	
	CL-3	1130	DE FRI/SAT	LUZERNE & RETURN	
	CO-2	1300	DE SUN	CHESTWOOD & RETURN	
SAYRE	ST-2	0630	DE SAT/SUN	LACEYVILLE & RETURN	
	SI-7	1600	DE SUN	ITHACA & RETURN	
WARWICK	WH-2/1	0700	DE SAT/SUN	HIGHLAND & RETURN	
	NE-1	1300	DE SAT/SUN	PHILLIPSBURG & RETURN	

ORIGIN	TRAIN	LEAVE	FREQUENCY	TO	ARR.	NOTE
CAMDEN PAVONIA	WY-843	0100	DE SAT	CARNEYS POINT	0830	A
	CR-20/21	0500	DE SAT/SUN	FT. DIX/MEDFORD & RETURN		
	CM-91	0530	DE SAT/SUN TUE/FRI	BEESLEYS POINT PALERMO/CAPE MAY	1100	B
	CA-295/294	0630	DE SAT/SUN	WOODCREST & RETURN	1100	C
	A-38/39	0700	DE SUN	BURLINGTON & RETURN		
	WY-37/34	0700	DE SUN	MILLVILLE & RETURN	1145	D
	WY-379	0830	DE SUN	BRIDGETON	1230	E
	CA-299/300	1000	DE SAT	WILLIAMSTOWN JCT. & RETURN	1145	
	WY-841	1100	DE SAT/SUN	PEDRICKTOWN	1530	F
	AR-2	1300	DE SUN	PORT RICHMOND	1600	
	WY-847/846	1330	DE SAT/SUN	THOROFARE & RETURN	1830	H
	WY-70	1730	DE SAT/SUN	PAULSBORO	2330	G
	A-30	2100	DE SUN	MORRISVILLE		I

A - MAKEUP: 1. PAULSBORO 4. CARNEYS POINT
PICKUP AT GIBBSTOWN: 2. BRIDGEPORT 3. PEDRICKTOWN
B - MAKEUP: 1. CAPE MAY 2. BEESLEYS POINT
PICKUP AT BROWN: 2. BEESLEYS POINT (OIL)
SIDE TRIP TO CAPE MAY AS NEEDED.
C - MAKEUP: 1. CEDAR BROOK/BRADDOCK 2. ATLANTIC CITY
SET OFF BLOCK 2 AT WINSLOW FOR CA-299.
D - MAKEUP: 1. SEWELL 2. PITMAN 3. MILLVILLE
E - MAKEUP: 1. GLASSBORO 2. ELMER 3. BRIDGETON
F - MAKEUP: 1. GIBBSTOWN 2. BRIDGEPORT 3. PEDRICKTOWN
G - MAKEUP: 1. WOODBURY/WOODBURY HGTS. 2. SALEM
H - MAKEUP: 1. THOROFARE
PICKUP AT BROWN: 1. THOROFARE
I - MAKEUP: 1. MORRISVILLE 2. SELKIRK (CONNECTS TO ENSE)
PICKUP PER MAKEUP AT BURLINGTON

ORIGIN	TRAIN	LEAVE	FREQUENCY	TO	ARR.	NOTE
CARNEYS POINT	WY-842	1930	DE SUN	PAVONIA	0200	A

A - MAKEUP: 1. GIBBSTOWN 2. CONWAY 3. PAVONIA

READING DIVISION

6-1-78

ORIGIN	TRAIN	LEAVE	FREQUENCY	TO	ARR.	NOTE
READING	SP-1	0215	EX SUN	ST. NICHOLAS		C
	RCH-2/1	0700	MON/TUE/THU FRI	ALBURTIS & RETURN		
	RAK-6/5	0700	MON/WED/FRI	AKRON & RETURN		
	RL-2/1	0730	EX SUN	BIRDSBORO & RETURN		
	RE-1/2	1030	MON/WED/FRI	EVANSVILLE & RETURN		
	RC-4/3	1900	DAILY	COATESVILLE & RETURN	2300	B
	PP-16	2000	EX SUN	PORT RICHMOND	0300	D
	RWC-1/2		AS NEEDED	W. CRESSONA & RETURN		

B - MAKEUP: 1. BIRDSBORO 2. COATESVILLE
C - MAKEUP: 1. TAMAQUA 2. BUCK MTN. 3. ST. NICHOLAS
D - MAKEUP: 1. POTTSTOWN 2. PHOENIXVILLE 3. ABRAMS
4. WEST FALLS 5. NICETOWN 6. FAIRHILL
7. PORT RICHMOND
PICKUP AT PHOENIXVILLE & ABRAMS

ORIGIN	TRAIN	LEAVE	FREQUENCY	TO	ARR.	NOTE
RUTHERFORD	HOY-2/1	0700	EX SUN	LEBANON & RETURN		
	RL-3/4	0700	EX SAT	LURGAN & RETURN		
	HR-51	0700	DAILY	HAGERSTOWN		E
	HB-8	0830	DAILY	BETHLEHEM	1300	A
	HH-1	1000	DAILY	LURGAN		
	HP-12	1030	DAILY	PORT RICHMOND		C
	RL-1/2	1100	EX SUN	LURGAN & RETURN		
	HA-16	1500	DAILY	ALLENTOWN	1900	B
	WC-97	2030	DAILY	LURGAN	2200	F
	HR-22	2200	DAILY	READING	0400	D
	HLE		AS NEEDED	LURGAN		G

A - MAKEUP: 1. LEBANON 2. BETHLEHEM LOADS 3. BETHLEHEM EMPTIES
B - MAKEUP: 1. C&F BRANCH 2. D&H 3. ALLENTOWN
SET OFF BLOCK 1 AT ALBURTIS.
C - MAKEUP: 1. PHOENIXVILLE 2. ABRAMS 3. NICETOWN
4. PORT RICHMOND
D - MAKEUP: 1. PRESCOTT 2. WATER 3. SPRING 4. W&N 5. R&C
6. UPROAD
E - MAKEUP: 1. N&W WEST OF SALEM 2. N&W-ROANOKE EAST & SOUTH
3. N&W-ST. JAMES, MD. TO HOLLINS, VA.
F - MAKEUP: 1. WM-CHERRY RUN-B&O
G - MAKEUP: 1. WM-LURGAN 2. B&O/C&O/WM EMPTY HOPPERS

:lassification Yards	Hump or Flat	Design Capacity for Classifying cars per 8 hour shift	Operate During Hours 11 pm to 7 am	Cars Classified per Shift (approx.)	No. of Trains In per Shift per day			No. of Trains Out per Shift per day		
					1	2	3	1	2	3
ıtherford	Hump (2)	900	Yes	700	7	7	3	9	9	1
onway	Hump (2)	1650	Yes	1500	21	20	16	15	15	19
rontier	Hump	800	Yes	700	7	6	2	4	5	7
.R.Young Elkhart	Hump	1000	Yes	900	8	13	15	16	12	7
ig Four	Hump	1000	Yes	900	8	12	7	9	9	12
avonia	Hump	300	No	200	3	8	5	9	2	5
elkirk	Hump	1000	Yes	900	9	11	15	11	12	8
:ola	Hump (2)	1500	Yes	1300	10	11	12	13	11	8
edar Hill	Hump	500	No	225	7	3	2	2	7	3
unction to Detroit	Hump	700	Yes	650	4	4	3	4	5	4
orrisville	Hump	300	Yes	240	7	5	3	7	3	6
ewitt	Hump	500	Yes	500	5	8	7	6	9	8
haronville	Hump	700	Yes	625	3	7	11	7	8	6
tanley	Hump	800	Yes	500	3	6	5	4	6	6
llentown	Hump (2)	700	Yes	650	5	6	7	6	6	6
uckeye	Hump	1000	Yes	850	9	6	7	11	7	8

TABLE OF CONTENTS

INTRODUCTION

On April 17, 1979, the "Notice of Proposed Rulemaking for Noise Emission Standards for Transportation Equipment Interstate Rail Carriers" was published in the Federal Register. These standards, proposed by the U. S. Environmental Protection Agency, are intended to control overall facility - especially, rail yard - and equipment noise at the receiving property limit. Additionally, standards for specific pieces of equipment or operations of equipment apply to retarders, mechanical refrigeration cars and car coupling. The standards, as proposed by EPA, are listed below:

Source	Receiving Property Standards, dB			Effective Date
	24-hour period, L_{dn}	1 hour period, $L_{eq(1)}$ daytime	1 hour period, $L_{eq(1)}$ nighttime	
All Yard Facilities & Equipment	70	84	74	1982
Hump Yard Facilities & Equipment	65	79	69	1985

Source	Standards, L_A	Effective Date
Retarders	90 dB at 30 meters	1982
Refrigerator Cars	78 dB at 7 meters	1982
Car Coupling	95 dB at 30 meters	1982

As part of the overall analysis and evaluation of the standards by the Association of American Railroads and its member roads, Southern Railway addressed one of the implications of these standards. If the proposed standards are enacted with their stringently low levels for allowable noise and with the added penalties to nighttime noise factored into the L_{dn} measurement, and if, as suggested in the results of analyses of currently-available noise abatement technology, railroads are unable to meet these levels using that technology, then the only means (besides buffer acquisition) which could possibly allow compliance with the standards are curtailment and rescheduling of nighttime operations, a measure which the EPA views as a viable - yet, last - resort.

In July, 1978 and again in April, 1979 (when the specifics of the proposal became available), the Operations Research Department of Southern Railway was asked to analyze the effects that curtailment of yard operations - particularly during nighttime hours - would have on overall operation of the Southern Railway. To do this, Southern's computer simulation model, called SIMTRAN, was used to predict the effects of changes in operation. This program accepts, as input, train schedules, routing policies, yard and line of road characteristics, and traffic to be moved from origin to destination. The logic of the program simulates the movement of this traffic from origin to destination, as controlled by these input parameters. Reports produced from the program provide statistics regarding origin to destination traffic flow, yard congestion, train delay - all designed to indicate the effectiveness of the operating plan being evaluated.

Three simulation exercises were conducted to show the impact of nighttime curtailment. The report which follows describes the results obtained and the methodology employed.

SUMMARY OF FINDINGS:

The following conclusions have been drawn from the simulation studies conducted.

1. Total curtailment of nighttime classification at merely one major freight yard facility will not only cripple that yard's productivity but also adversely affect systemwide operations to the point that total system shutdown would occur.
2. Partial curtailment of nighttime operations at yards bordering on non-compatible (or developed) land uses will result in a severe deterioration in service, will cripple productivity at a number of major facilities and will result ultimately in total system shutdown.

METHODOLOGY

SIMTRAN is a computer model designed to simulate the movement of traffic through the Southern Railway System. It is a so-called "network model" similar in concept to the AAR Network Model developed in the late 1960's, and other models developed independently by several railroads. Southern began the development of its first network model in 1967. SIMTRAN is the third such model and has been in use since the early 1970's to evaluate the impact of major operating changes on the railroad. It was employed before and after the opening of the Sheffield (Alabama) hump yard in 1973 to evaluate revised train schedules and routing policies to be used in conjunction with the new hump yard. It was used in a similar fashion to help justify a new hump yard at Linwood, N. C., which yard is currently being completed. Its most recent use, other than the noise abatement study reported here, has been to design a new train service plan to take maximum advantage of the hourly car hire rules that went into effect in July 1978.

An extensive amount of input data is required to drive this model. Major areas of definition are train service, routing (blocking) policy, yard characteristics, line of road characteristics and traffic to be moved. Major elements required in each category are the following:

Train Service (for each train): departing terminal, time of departure, next destination, car limit, tonnage limit, class, minimum car and tonnage limits for operation, days of week operating, running time to next destination.

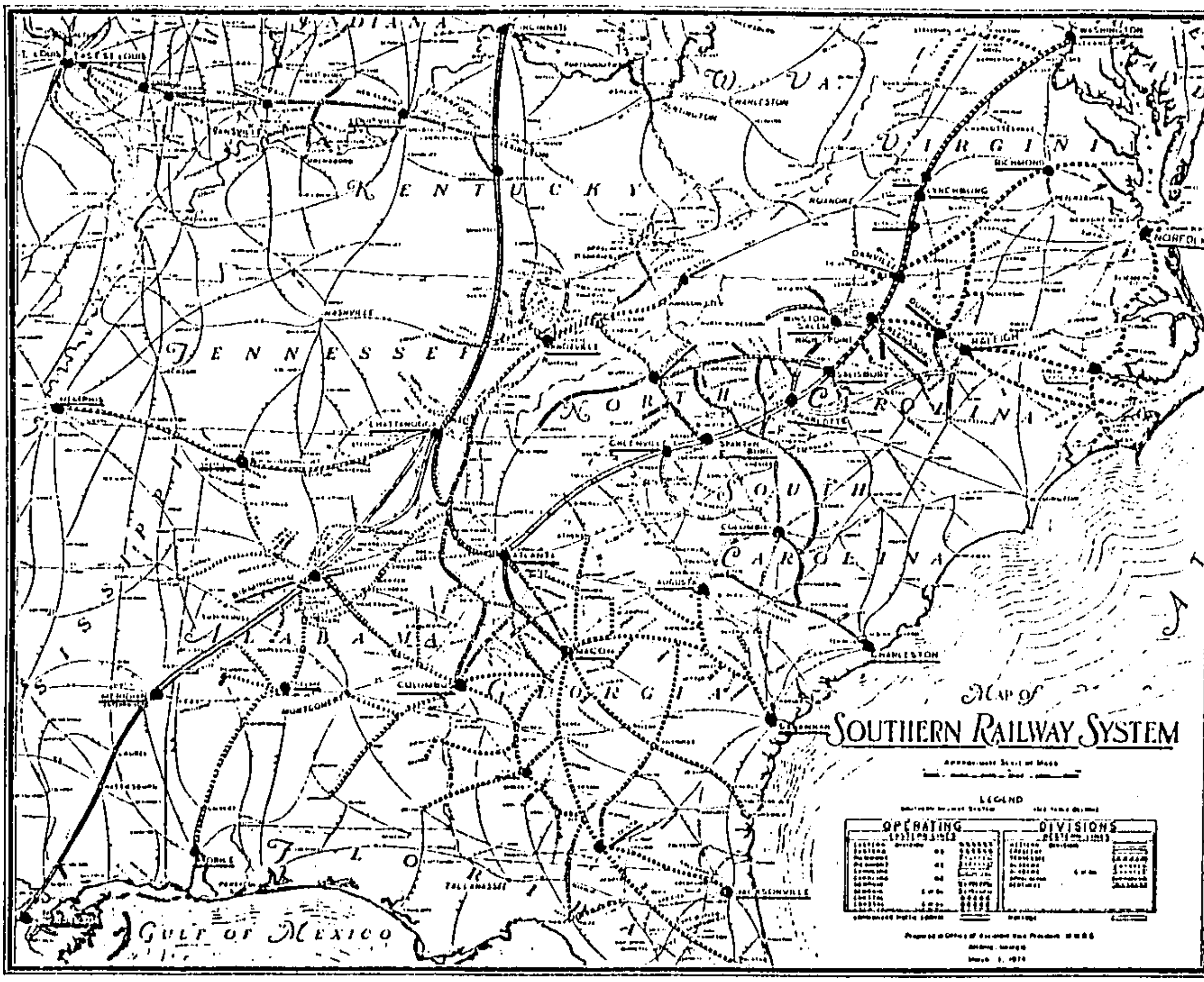
Blocking Policy (for each block on each train): train, priority, next destination of block, traffic carried in block, types of cars allowed.

Yard Characteristics (for each terminal in network): yard capacity, receiving yard capacity (if a hump yard), hourly traffic processing rate, specified by shift.

Line of Road Characteristics (for each line segment): capacity, basic running time (each direction) by class of train.

Traffic (for each car or group of cars with similar characteristics): originating terminal, time of origination, destination on line, car type, load or empty status.

This data is totally mechanized. Train service, blocking policies, yard and road characteristics are maintained in computerized files. One such file represents "current operating policy" and is continually updated to reflect latest changes. The "standard" network defined by this file con-



YARDS CONTAINED IN THE STANDARD SIMTRAN NETWORK tains forty-six terminals on the Southern Railway system. These terminals are shown on the system map on the preceding page. This standard file was employed in the noise abatement study. Traffic data for any selected historical period is extracted from computerized car movement history files. Traffic for May 1-16, 1978, a typically heavy traffic period, was selected for this analysis.

Model Logic controls the movement of cars from origin to destination. After a cut of cars comes on line at its origin terminal, it is placed in a classification queue, behind all other cars awaiting classification. The time these cars are available for outbound departure is determined by the number ahead and the processing (classification) rate of the yard. Once classified, the cars will be assigned to the first eligible departing train having sufficient available space.

The cars will move on this train either to final destination or to some intermediate handling point. The process is repeated until the cut of cars departs its final terminal on a local train or is delivered to another railroad in interchange.

Statistics are gathered throughout the simulation and reflect car movement, train movement and yard performance.

The methodology employed in this EPA related study was to vary the traffic processing rates for those yards whose operation would be curtailed. This rate, for each yard, is the number of cars that can be processed hourly and reflects classification, outbound pull back and overhead. The hourly processing rate can be further varied by shift of operation.

In each of the three scenarios analyzed, a different curtailment assumption was tested. In the first case study, the effects of total curtailment nightly at one major hump yard were evaluated. The second case study considered the effects of partial curtailment nightly for several, but not all, of the yards bordering on "developed" land. In each of these first two cases, the nighttime curtailment is reflected in SIMTRAN by reducing or eliminating the midnight-8AM processing rate for the yards involved. Note that this is a shorter period (by one hour) than the 10PM-7AM criterion proposed by EPA in the heavier weighting of noise emitted during nighttime hours in the L_{dn} measure. The modeled time period of eight hours is, therefore, less stringent than the EPA - proposed time period of nine hours. Further, the model's night shift starting time of midnight varies from the EPA starting time of 10PM; but, careful analysis has shown that this two hour variance would have little or no effect on the results predicted by the model.

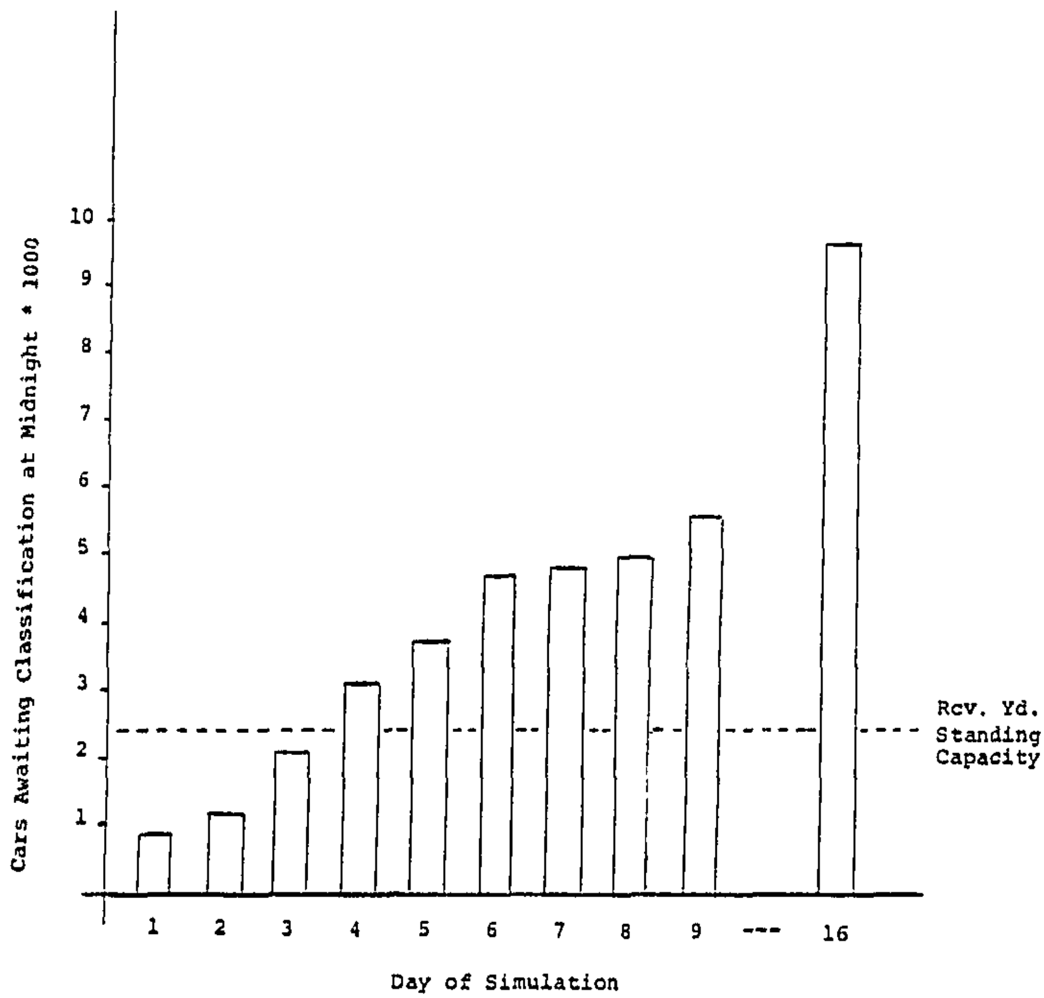
In the third case study, the processing rate for each shift is adjusted to reflect a 50% reduction in processing during the nine hours from 10PM to 7AM and a 10% increase in processing during the fifteen daytime hours. This was done for all yards bordering on developed land.

CASE #1: TOTAL CURTAILMENT

The first exercise undertaken was intended to show the effect of totally shutting down car classification at one major yard facility during the period midnight-8AM. Inman Yard, within the city limits of Atlanta, Georgia, was chosen. Inman is the largest hump yard operation on the Southern Railway: sixteen receiving yard tracks, sixteen forwarding yard tracks and sixty-four classification tracks. Approximately twenty-five hundred cars are classified over the hump daily. Between 3500 and 4000 cars are handled through the yard daily. A large number of these cars either originate or terminate in the Atlanta area.

In the simulation analysis, the hump was closed down from midnight until 8AM. Train arrivals and departures during this period were not altered. The effect on the standing capacity of the Inman receiving yard is shown graphically in Figure 1. This plots the number of cars awaiting classification at midnight daily, over the sixteen day period simulated. Under the normal three shift operation, an average of 416 cars await classification at midnight daily. Under the curtailed operation this average is 5709 cars. The standing capacity of the Inman receiving yard is 2400 cars. As Figure 1 shows, the backlog of cars continually increases. In fact, the capacity of the receiving yard becomes exceeded during the third day of operation and all practical yard operation would have terminated

Figure 1: Inman Receiving Status
Simulation Run #1: Total Curtailment, Mdnt-8AM



by this time. The simulation, assuming a limitless receiving yard storage area, was permitted to continue through sixteen days of operation to see if any stabilizing trend developed. None did.

The effect on car transit times from origin to destination is also highly negative. Under normal operation in these sixteen days (simulated), the average origin to destination trip time for all cars on the Southern Railway is 50.7 hours. Under the curtailed operation (with only this one facility closed at night), the transit time increases to 56.6 hours. Cars handled directly by the Inman facility fare much worse than this average indicates. For instance, the trip time for cars originating in the Atlanta area destined for Cincinnati increases from 47 hours to 117 hours while the trip time for cars in the opposite direction increases from 51 hours to 139 hours. Note that these statistics reflect only those movements successfully reaching their destination. A disproportionate number of cars in the curtailment study did not reach their destination in the sixteen-day simulation period.

These results indicate that total nighttime curtailment of merely one major yard facility is totally impractical. The effect of shutting additional facilities would logically be even more impractical.

CASE #2: PARTIAL CURTAILMENT

This analysis of partial nighttime curtailment - as well as the preceding Case #1 analysis - was done in July, 1978. At that time, land use definitions for "compatible" and "non-compatible" land from the Standard Land Use Coding Manual were being considered by the EPA for application of rail yard noise emission standards. Yards bordering on "compatible" land, i.e., manufacturing areas or undeveloped areas, were slated for less stringent standards that those required for yards bordering on "non-compatible" land, i.e., residential, commercial, or institutional use areas.

With this differentiation, an analysis was undertaken to quantify the system-wide effects of partial curtailment of operations. It was felt that halving the nighttime classification capability at yards bordering on "non-compatible" land use would fairly represent this minimum. [Theoretically, one may expect a reduction of the Leq (1) by approximately three decibels when the level of activity is reduced by one half.] Yards bordering on compatible land use were allowed to operate at full capacity in the analysis. Of the forty-six yards considered in the simulation, thirty were classified as non-compatible. (See Table I below.) Note that of the six hump yards currently operating on Southern Railway, four border on non-compatible land uses.

As in the first simulation exercise, a full sixteen days of simulated operation was attempted. However, SIMTRAN terminated after nine days of operation due to an excessively large backlog of cars awaiting classification at various yards. Due to this

Table 1

Southern Railway Yards "Compatibility" Status

1. "Compatible" Yards:

Asheville	Frisco Yard, Tn.	Mt. Vernon
Bristol	Jacksonville	Richmond
Centralia	Louisville	* Selma, Al.
Chocowinity	* Macon (Brosnan)	* Sheffield
Cincinnati	Mobile	Spencer
Columbus, Ga.		

2. "Non-compatible" Yards:

Albany	Columbia	Meridian
Altavista	Danville, Ky.	Monroe
Andover	Danville, Va.	New Orleans
* Atlanta (Inman)**	Durham	Norfolk
Augusta	E. St. Louis	Pot Yard
* Birmingham (Norris)	Greensboro	Princeton
Charleston	Greenville	Raleigh
Charlotte	* Knoxville (Sevier)	Savannah
Chattanooga (DeButts)	Lynchburg	Spartanburg
	Memphis	Valdosta
		Winston-Salem

*Hump yards.

**For purposes of these studies Inman Yard and the adjacent piggyback facilities are treated as one yard.

premature termination, car transit time statistics were invalidated. However, yard congestion results were available and are summarized as follows:

1. The sixteen compatible yards suffered no deterioration of service. These yards handle 34% of all cars processed daily on the Southern Railway System.
2. One-half (fifteen) of the "non-compatible" yards suffered no significant deterioration of service. Three of these (Altavista, Durham, and Lynchburg) do not currently operate during nighttime hours in the first place. Nine more of these yards (Andover, Columbia, Danville (Ky.), Danville (Va.), East St. Louis, Memphis, Monroe, Raleigh and Winston-Salem) currently process fewer than 50% of their potential nighttime capacity. The remaining three yards in this category (Greenville, Norfolk, Meridian) did suffer deterioration of service during nighttime hours but were able to absorb the backlog during daylight hours. These fifteen yards handle 18% of all cars processed daily on Southern.
3. The other fifteen "non-compatible" yards experienced severe yard congestion due to partial nighttime curtailment. These fifteen yards normally handle 48% of all cars processed daily on the System. Five of these yards (Albany, New Orleans, Potomac Yard, Spartanburg and Valdosta) operated at or over capac-

ity at some period during the nine days but stabilized to within 70% of standing capacity by the ninth day. Three yards (Birmingham, Charlotte, Knoxville) exceeded standing capacity early in the period and continued to backlog cars at an uncontrolled rate. Three additional yards (Atlanta, Chattanooga, and Savannah) experienced a continuously growing backlog of cars to be handled. After nine days these three yards are in excess of 90% of standing capacity and show no signs of stabilizing. The remaining four yards (Augusta, Charleston, Greensboro and Princeton) after nine days are operating between 70% and 90% of standing capacity with no surety of stabilizing.

4. The six yards in paragraph 3 above which are near or over capacity and which show no signs of stabilizing normally account for 34% of all traffic handled daily. Four of these six are hump yards.

These results were obtained by comparing yard traffic levels with "standing" capacities. Standing capacity is a theoretical maximum defined by the number of cars a yard can hold. The more realistic <u>operating</u> capacity of a yard is somewhat less and defines the congestion level at which yard operations severely deteriorate and the yard becomes "blocked out." The physical number of cars in a yard which equate to this operating capacity is difficult to quantify. Results above are measured against theoretical capacities, when in reality the impact of nighttime curtailment is much more severe under operating capacity restrictions.

Figure 1 on a previous page showed the rapid increase of backlogged cars in the Inman receiving yard if that yard only were totally shutdown at night. For comparison purposes, Figure 2 (below) shows the Inman receiving yard status under half curtailed operation. Note that by the ninth day standing capacity is exceeded; capacity was nearly reached earlier in the simulated period.

The conclusion that must be drawn from this second exercise is that even a minimal disruption of nighttime operation at major yard facilities has a drastic negative impact on system operation. Any further nighttime operating restrictions beyond these minimal measures would cause further disruption, resulting in total system shutdown.

Figure 2: Inman Receiving Status
Simulation Run #2: Yard Opn. Curtailed,
Mdnt-8 AM.

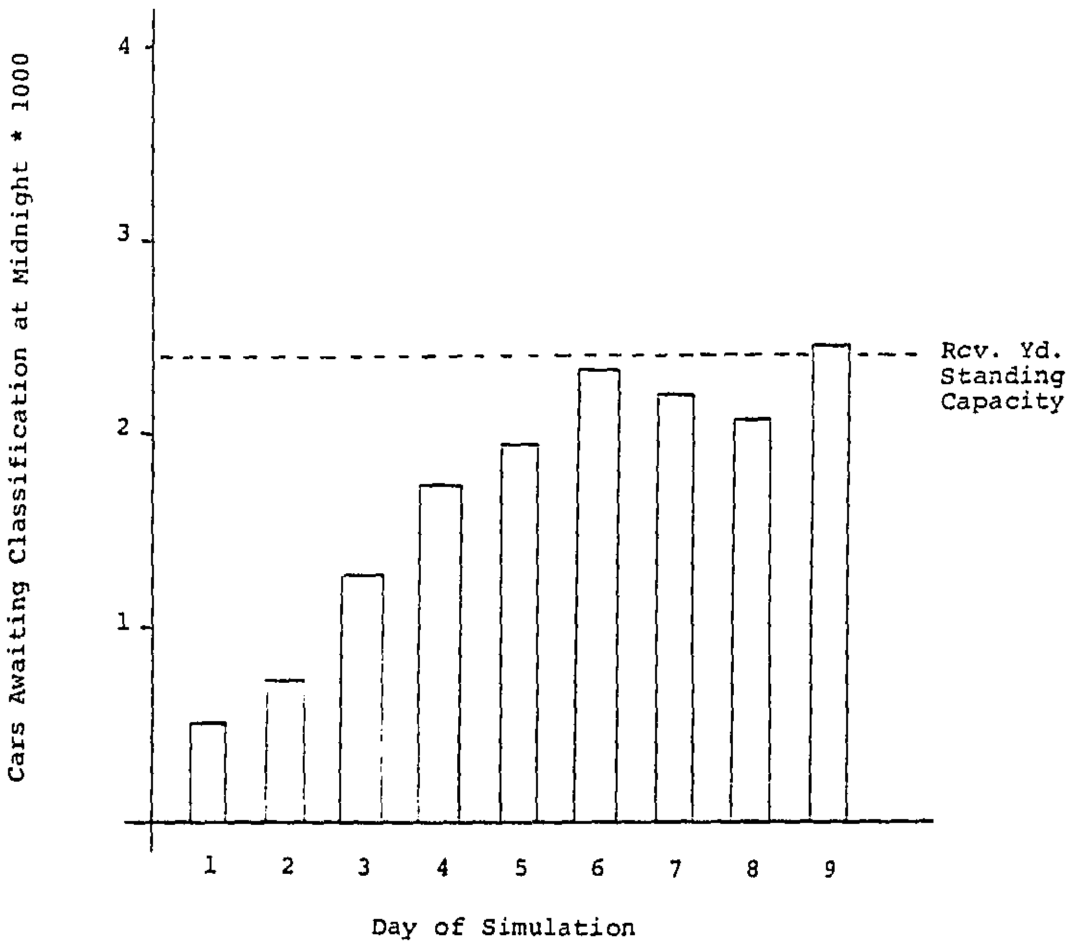


TABLE 2
COMPARISON OF ASSUMPTIONS MADE IN
CASE #2 and CASE #3

	Case #2	Case #3
Land Use Definitions	"Compatible" vs. "Non-compatible"	"Developed" vs. "Undeveloped"
Period of Curtailment	12M - 8AM	10PM - 7AM
Hours of Curtailment	8 hours	9 hours
Factor of Curtailment[1]	50%	50%
Factor of Increase[2]	100%	110%
Factor of Daily Level of Activity[3]	83%	88%

1"Factor of curtailment" (FC) is the modelled level of activity relative to the normal level of operations during the period of curtailment. (Note that this factor is the same in both cases.)

2"Factor of increase" (FI) is the modelled level of activity relative to the normal level of operations during daytime hours.

3"Factor of daily level of activity" (FDLA) is the modelled level of activity over a twenty-four hour period relative to normal yard processing operations. This factor is calculated using the factors of curtailment and increase as follows:

$$FDLA = \frac{\text{Hrs. of Curtail.} * FC + (24\text{-Hrs. of Curtail.}) * FI}{24}$$

$$FDLA_{\text{Case 2}} = \frac{8 * .50 + 16 * 1.00}{24} = .83$$

$$FDLA_{\text{Case 3}} = \frac{9 * .50 + 15 * 1.10}{24} = .88$$

CASE #3: PARTIAL CURTAILMENT

A second analysis of partial nighttime curtailment was done in May, 1979, after the proposed rail yard noise level standards were published in the Federal Register. This analysis is similar to the Case #2 analysis of partial curtailment, but differs from it in several respects. The differences in approach between the two analyses are shown in Table 2.

As shown in Table 2, Case #3 applies land use definitions for property bordering on yards of "developed" or "undeveloped" property rather than "compatible" or "non-compatible" land. "Undeveloped property", as defined in the proposed standards, means "any land property that has not been developed for human use in any of the following Standard Land Use Coding Manual (SLUCM) general land use classifications: residential; manufacturing; transportation; communication and utilities; trade; services; and cultural, entertainment and recreational." Since manufacturing areas are included in the "developed property" definition, but not in the "incompatible" land definition, eight additional yards are subjected to partial curtailment in this analysis. (See Table 3.) Again, as was the case in the preceding analysis, four of the six hump yards currently operating on Southern Railway are subject to partial curtailment.

The second difference between the two partial curtailment analyses entails a difference in both the period and the hours of curtailment. In the previous analysis, the third shift of operation - the eight hours between midnight and 8AM - was curtailed.

Table 3

Southern Railway Yards on "Undeveloped" and "Developed" Property

1. Yards Bordering on "Undeveloped" Property:

Centralia	Mt. Vernon
Chocowinity	Richmond
Frisco Yard, Tn.	* Sheffield
* Macon	Spencer

2. Yards Bordering on "Developed" Property:

Albany	** Columbus, Ga.	** Mobile
Altavista	Danville, Ky.	Monroe
Andover	Danville, Va.	New Orleans
** Asheville	Durham	Norfolk
* Atlanta (Inman)	E. St. Louis	Pot Yard
Augusta	Greensboro	Princeton
* Birmingham	Greenville	Raleigh
** Bristol	** Jacksonville	Savannah
Charleston	* Knoxville	** Selma, Al.
Charlotte	** Louisville	Spartanburg
* Chattanooga	Lynchburg	Valdosta
** Cincinnati	Memphis	Winston-Salem
Columbia	Meridian	

* Hump yards.

** Yards curtailed in Case #3 analysis which were not curtailed in Case #2.

This analysis, however, models the nine-hour period from 10PM to 7AM specified in the proposed standards.

Thirdly, an attempt was made in this analysis to compensate for the reduced level of nighttime activity by increasing daytime operations to an extent possible, given practical capacity constraints. A review of yard operating capacities indicated that a ten percent increase in the level of operations is a reasonable goal.

As in the previous simulation exercises, sixteen days of simulated operation were attempted. Again, as in the Case #2 analysis, SIMTRAN terminated, in this case after ten days of operation (as compared with nine days) due to an excessively large backlog of cars awaiting classification at various yards. Again, yard congestion resulted in much the same manner as before. These results are summarized below:

1. The eight yards bordering on undeveloped land use, and therefore not curtailed, suffered no deterioration of service. These yards handle 18% of all cars processed daily on the Southern Railway System.

2. Twenty-four of the yards bordering on developed land use, suffered no significant deterioration of service. Four of these (Alta Vista, Bristol, Durham, and Lynchburg) do not currently operate during nighttime hours, thus no curtailment was necessary. Ten more of these yards (Andover, Columbia, Danville (Ky.), Danville (Va.), East St. Louis,

Memphis, Monroe, Princeton, Raleigh, and Winston-Salem) currently process fewer than 50% of their potential nighttime capacity. The remaining ten yards in this category (Albany, Asheville, Augusta, Greenville, Meridian, Mobile, New Orleans, Norfolk, Selma and Valdosta) did suffer deterioration of service during nighttime hours but were able to absorb the backlog during daylight hours. These twenty-four yards handle 31% of all cars processed daily on Southern.

3. Fourteen of the yards bordering on developed land use and having curtailed nighttime operations experienced severe yard congestion. These yards normally handle 51% of all cars processed daily on the System. Two of these yards (Cincinnati and Columbus) operated at or over capacity at some period during the ten days but stabilized to within 70% of standing capacity by the tenth day. Four yards (Birmingham, Jacksonville, Knoxville and Savannah) exceeded standing capacity early in the period and continued to backlog cars at an uncontrolled rate. The remaining eight yards (Atlanta, Charleston, Charlotte, Chattanooga, Greensboro, Louisville, Pot Yard and Spartanburg) after ten days show no surety of stabilizing.

Figure 3 compares the receiving yard status during normal vs. curtailed operation of these four affected hump yards - Inman Yard in Atlanta, Georgia; Norris Yard in Birmingham, Alabama; deButts Yard in Chattanooga, Tennessee; and Sevier Yard in Knoxville. Figure 4 shows the yard status for both normal and curtailed operations at five of the larger flat yards which were adversely affected.

Results of this analysis support the conclusion drawn in the second exercise that even a minimal disruption of nighttime operation at major yard facilities has a drastic negative impact on system operation. Any further nighttime operating restrictions beyond these minimal measures would cause further disruption, resulting in total system shutdown.

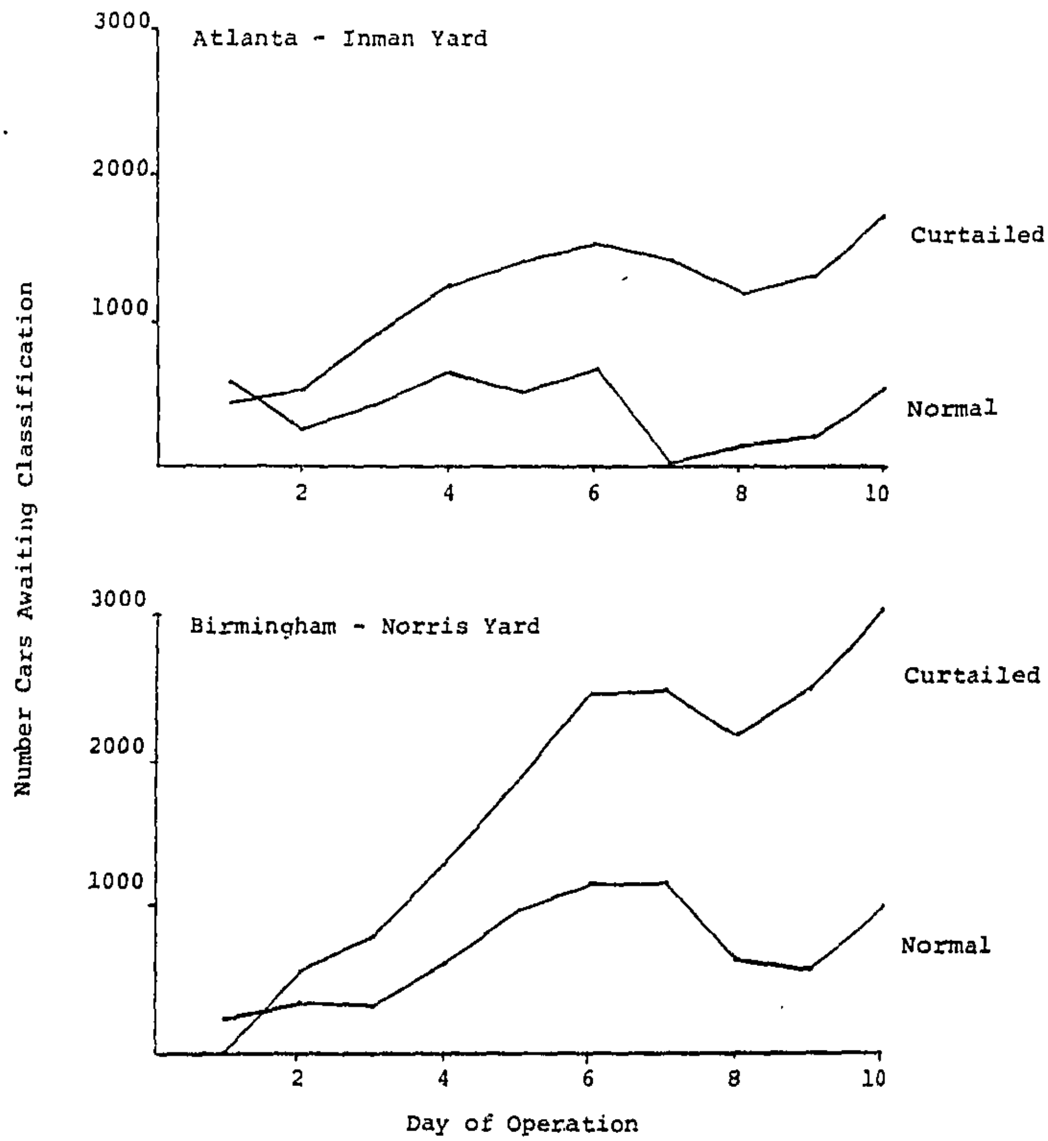


Figure 3: Receiving Yard Status at Affected Humpyards, normal vs. curtailed operation.

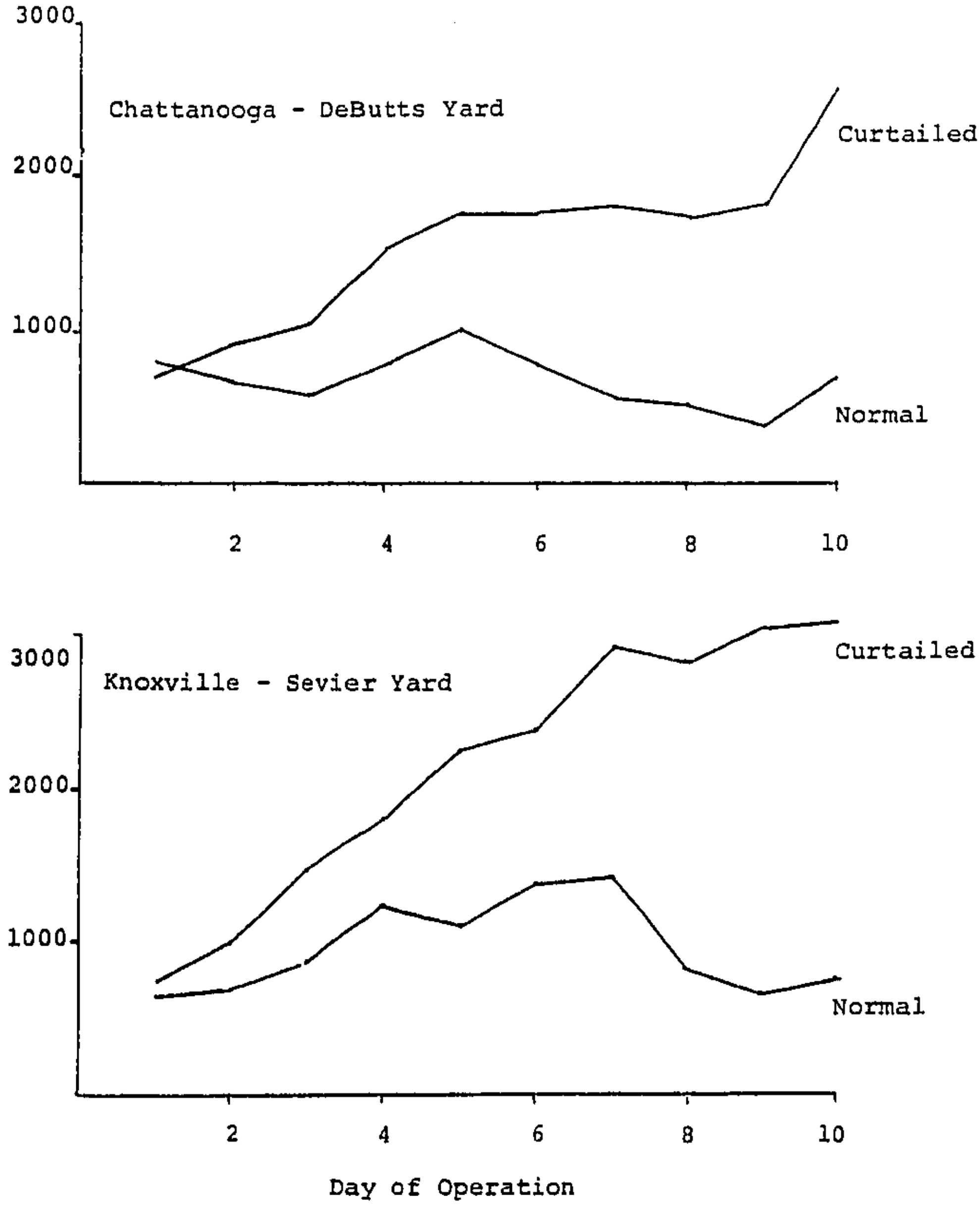


Figure 3 - Continued

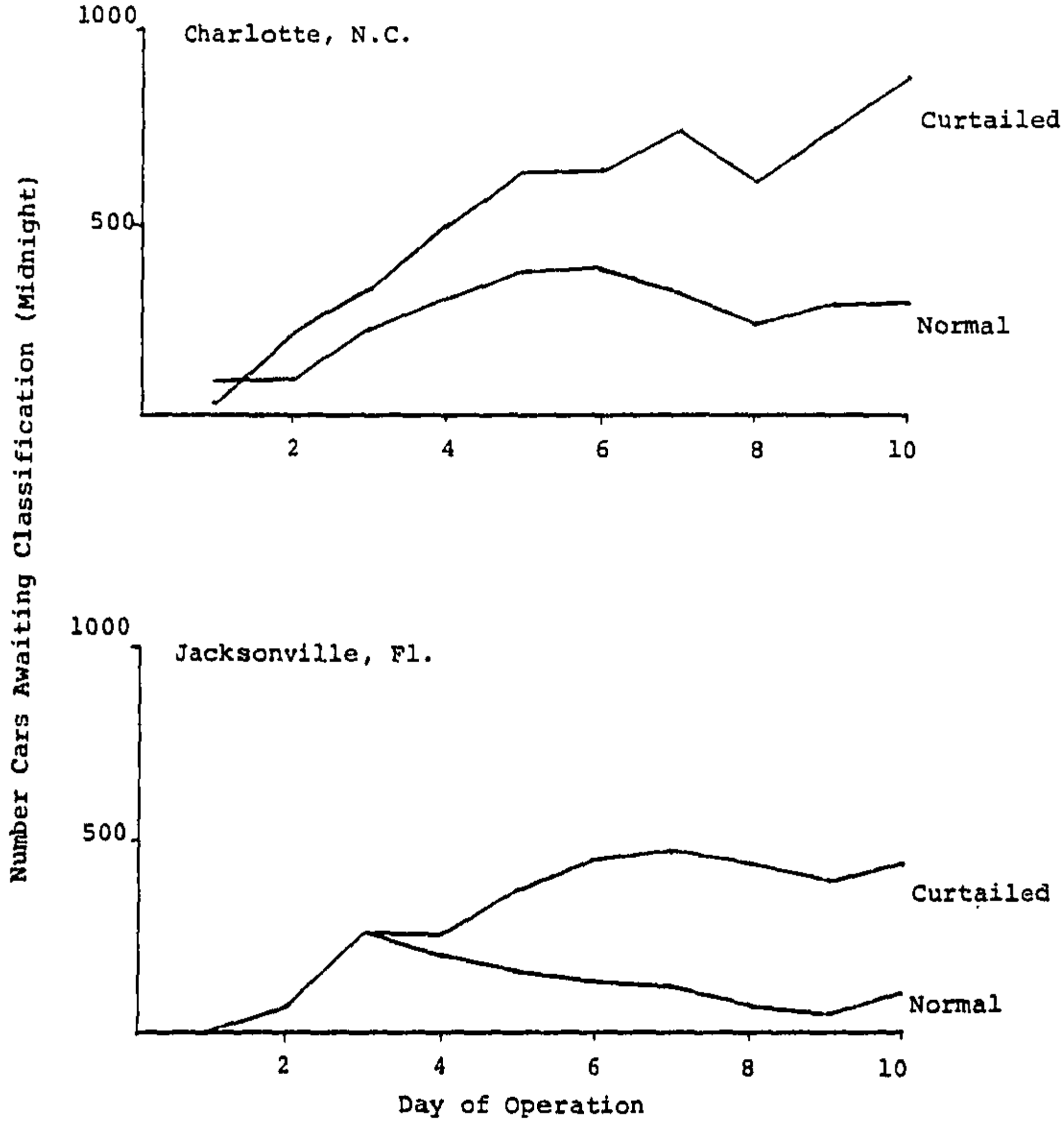


Figure 4 - Yard Status at Selected Flat Yards, Normal vs. Curtailed Operation.

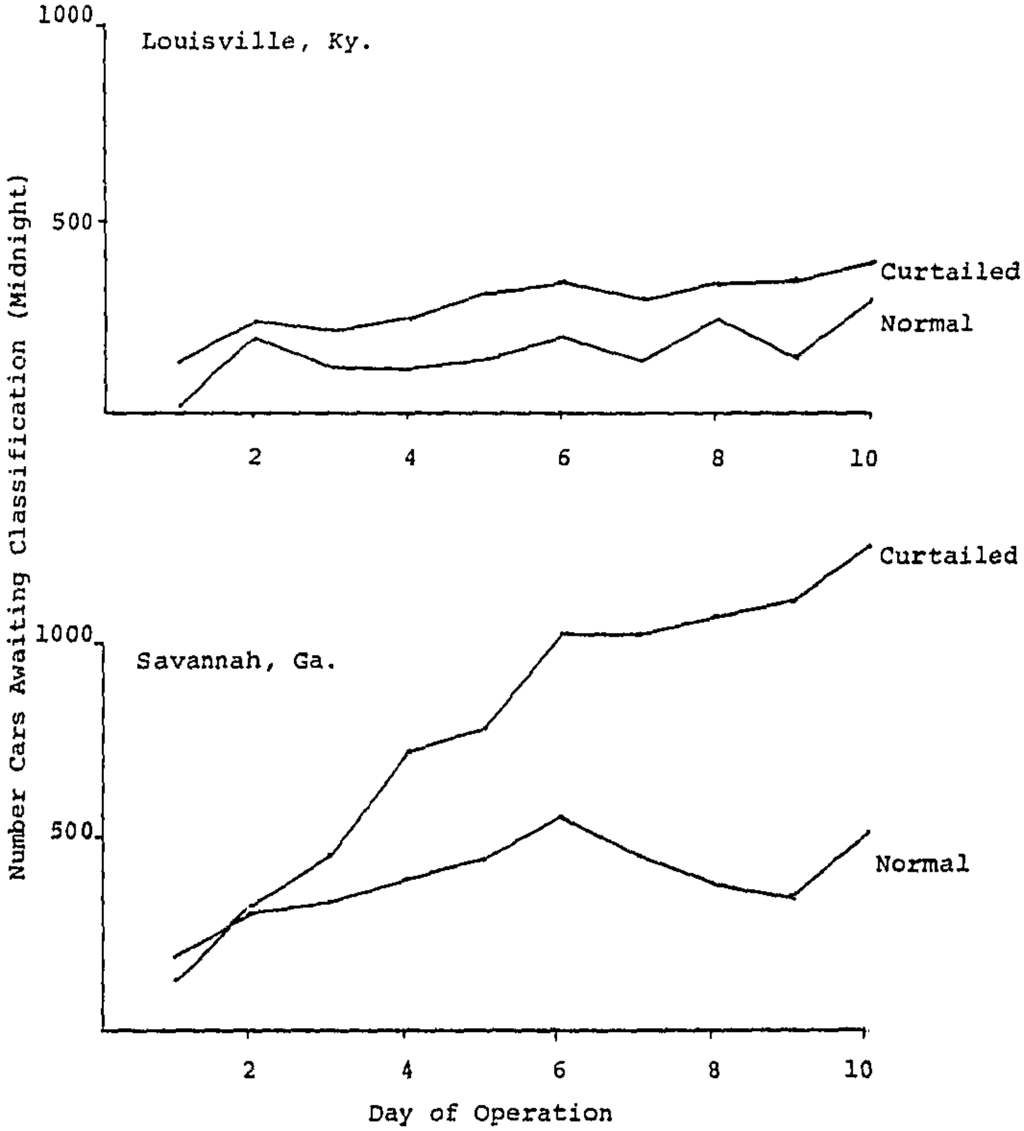


Figure 4 - Continued

Exhibit V

NOISE IMPLICATIONS OF REDUCED RAILROAD TRAFFIC

1.0 INTRODUCTION

A possible consequence of railroad noise emission standards is that freight carried by railroads may decrease, either as a result of rate increases or decreased rail system capacity. Much of this lost freight is likely to be transported by trucks. In this note, the effect of this transfer of freight on community noise exposure is estimated.

2.0 NOISE EMISSIONS OF TRUCKS AND TRAINS

Based on data presented in Reference 1, the average freight train has 67.2 cars and carries a net load of 1943 tons, with 55.5 percent of the cars loaded. Assuming an average car length of 60 feet, the noise exposure 100 feet from this average train traveling 60 mph on level grade is

$$SENEL_{train} = 103.9 \text{ dB}$$

This value was obtained using the method of Reference 2. SENEL from the locomotive is 98 dB, while that from the cars is 102.6.

Based on roadside noise level data collected in Reference 3, the typical maximum passby level 50 feet from a heavy truck at 60 mph is 88.3 dB. The noise exposure at 100 feet is

$$SENEL_{truck} = 87.1 \text{ dB}$$

Comparing the noise exposure from both, a single train generates as much noise as about 48 trucks.

The average cargo weight of long-haul tractor-trailor trucks is 13.5 tons (Reference 4, p.II-4). The cargo carried by one typical freight train would require 144 trucks at average loading.* The total noise exposure from these trucks would be

$$SENEL_{truck} + 10 \log_{10} 144 = 108.7 \text{ dB}$$

*The load factor for trucks, in terms of average load versus maximum permitted load, is comparable to the loaded car ratio of a train. The present calculation would thus give similar results if fully loaded trucks and trains were considered.

so that moving a trainload of cargo by truck is almost 5 dB louder than by train. For a given noise exposure, railroads can move three times as much cargo as trucks.

3.0 EFFECT ON POPULATION EXPOSURE

The above calculation in itself does not tell whether transfer of cargo from trucks to trains would adversely affect noise exposure in terms of people exposed. A model which incorporates land use and population data must be used to obtain this. Such models have been used to assess the total noise exposure from railroads[5] and heavy trucks.[6] Additional data on through truck versus local truck traffic would be needed to properly adapt previous calculations of this type to the present problem. However, the transferred cargo must move between the same points, hence through areas of similar land use. It therefore appears that increased noise exposure due to additional trucks would be several times greater than the decreased exposure due to fewer trains.

4.0 CONCLUSIONS

It has been shown that the noise exposure associated with moving a given tonnage by truck is approximately 5 dB higher than by train. A calculation of the ultimate effect on people exposed has not been carried out, but it appears that transferring cargo from trains to trucks is likely to significantly increase population exposure. Analysis of any railroad noise control measure which reduces cargo carried must include an examination of the increased exposure from other modes to which it is transferred.

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1. Yearbook of Railroad Facts: 1977 Edition.

2. Swing, J.W. and Pies, D.B., "Assessment of Noise Environments Around Railroad Operations", Wyle Research Report WCR 73-5, July 1973.

3. Sharp, B.H., "A Survey of Truck Noise Levels and the Effect of Regulations," Wyle Research Report WR 74-8, December 1974.

4. "Interagency Study of Post-1980 Goals for Commercial Motor Vehicles", Draft, June 1976.

5. "Background Document for Railroad Noise Emission Standards," EPA-550/9-76-005, December 1975.

6. "Background Document for Medium and Heavy Truck Noise Emission Regulations," EPA-550/9-76-008, March 1976.

National Association of Environmental Professionals
P.O. Box 1223, Alexandria, Va. 22313

May 10, 1979

Henry E. Thomas, Director
Standards and Regulations Division (ANR-490)
Office of Air, Noise, and Radiation
U.S. Environmental Protection Agency
Washington, D.C. 20460

Dear Mr. Thomas:

Thank you for your letter of April 13, 1979 regarding new regulations on railroad noise.

At its meeting on May 1, 1979, the Board of Directors of the National Association of Environmental Professionals voted not to comment on the proposed revised and expanded railroad noise regulations.

We appreciate your bringing this opportunity to our attention.

Sincerely yours,

Margaret C. Arnold

Margaret C. Arnold
Executive Secretary

HEARING, EDUCATIONAL AID & RESEARCH FOUNDATION, INC.
P.O. BOX 57241 WASHINGTON, D.C. 20037 202—457-7140

Please reply to: P.O. Box 57171, Washington, D.C. 20037

June 14, 1979

Henry E. Thomas
Director
Standards & Regulations Division (ANR-490)
US Environmental Protection Agency
Washington, D.C. 20460

Dear Mr. Thomas:

In response to your letter of April 13, 1979 we would like to offer the following comments and suggestions with respect to the matter of railroad noise regulations.

1. In our opinion it is imperative that to fulfill the complete intent of congress, Section 17 of the Act should be expanded to include the words "public health and welfare". With this amendment having been accomplished, the Environmental Protection Agency could then justify a stricter regulation since we have already established that public health and welfare are in potential danger as a result of environmental noise such as which is confronted in the railroad noise regulation under consideration. At a recent Model Symposium on Community Noise organized by this office, there was substantial evidence presented to confirm the potential damage to both hearing and other aspects of health as a result of elevated levels of noise within communities of our nation. It is clear then that if the Environmental Protection Agency is to be expected to protect citizens through regulations and through programs of the state and local level the above proposed amendment must be incorporated into the Act at the earliest possible date.

79-10-098

2. We propose that the Act be clarified with respect to the waiver of preemption by state and local governments through petition to EPA. It would appear to us that special local "conditions" identified in the Act should include conditions in which heavily populated urban communities are being threatened in their hearing and health as a result of excessive noise in railroad yards. Such areas should be viewed as having "special conditions" which may require additional steps and regulations at the local level to control noise. Such communities should have

Henry E. Thomas
June 14, 1979
Page Two

the option through a waiver of preemption to apply additional noise control measures and the railroads should be required to meet these additional requirements to protect the health and welfare of residents in the community. In our opinion this would not necessarily result in cost burdens to the industry, however specifics of this implementation would require further study and research.

In our opinion the issuance of the proposed railroad yard regulations will result in a contradictory position for the Environmental Protection Agency. On the one hand the Office of Noise Abatement and Control has adopted the approach of attempting to regulate noise sources and is achieving this through action at the federal level. On the other hand under the state and local programs activity of the Office of Noise Abatement and Control, communities are encouraged to undertake their own local programs to achieve a quieter America. The entire program contemplated by congress and now attempting to be enforced by the Environmental Protection Agency could be compromised and diminished to the point of complete ineffectiveness if this proposed regulation is allowed to stand as apparently dictated by court action.

We are forwarding a copy of this correspondence directly to the Rural Carrier Docket (ONAC 79-01) and to the Public Information Reference Unit of the Environmental Protection Agency as suggested in the Environmental News press release of May 30, 1979.

Thank you for this opportunity to comment. Hope you will advise us if we can be of any further assistance and if any further information is revealed which would be of interest to this organization.

Sincerely,

George W. Fellendorf, Ed.D.
Executive Director

cc: Luther L. Terry, M.D.

HEARING, EDUCATIONAL AID & RESEARCH FOUNDATION, INC.
P.O. BOX 57141 WASHINGTON, D.C. 20037 202—457-7140

Please reply to: P.O. Box 57171, Washington, D.C. 20037

June 14, 1979

Henry E. Thomas
Director
Standards & Regulations Division (ANR-490)
US Environmental Protection Agency
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Dear Mr. Thomas:

In response to your letter of April 13, 1979 we would like to offer the following comments and suggestions with respect to the matter of railroad noise regulations.

1. In our opinion it is imperative that to fulfill the complete intent of congress, Section 17 of the Act should be expanded to include the words "public health and welfare". With this amendment having been accomplished, the Environmental Protection Agency could then justify a stricter regulation since we have already established that public health and welfare are in potential danger as a result of environmental noise such as which is confronted in the railroad noise regulation under consideration. At a recent Model Symposium on Community Noise organized by this office, there was substantial evidence presented to confirm the potential damage to both hearing and other aspects of health as a result of elevated levels of noise within communities of our nation. It is clear then that if the Environmental Protection Agency is to be expected to protect citizens through regulations and through programs of the state and local level the above proposed amendment must be incorporated into the Act at the earliest possible date.

79-01-104

2. We propose that the Act be clarified with respect to the waiver of preemption by state and local governments through petition to EPA. It would appear to us that special local "conditions" identified in the Act should include conditions in which heavily populated urban communities are being threatened in their hearing and health as a result of excessive noise in railroad yards. Such areas should be viewed as having "special conditions" which may require additional steps and regulations at the local level to control noise. Such communities should have

H.E.A.R.
a non-profit corporation in honor of Mabel Hubbard—Mrs. Alexander Graham Bell

Henry E. Thomas
June 14, 1979
Page Two

the option through a waiver of preemption to apply additional noise control measures and the railroads should be required to meet these additional requirements to protect the health and welfare of residents in the community. In our opinion this would not necessarily result in cost burdens to the industry, however specifics of this implementation would require further study and research.

In our opinion the issuance of the proposed railroad yard regulations will result in a contradictory position for the Environmental Protection Agency. On the one hand the Office of Noise Abatement and Control has adopted the approach of attempting to regulate noise sources and is achieving this through action at the federal level. On the other hand under the state and local programs activity of the Office of Noise Abatement and Control, communities are encouraged to undertake their own local programs to achieve a quieter America. The entire program contemplated by congress and now attempting to be enforced by the Environmental Protection Agency could be compromised and diminished to the point of complete ineffectiveness if this proposed regulation is allowed to stand as apparently dictated by court action.

We are forwarding a copy of this correspondence directly to the Rural Carrier Docket (ONAC 79-01) and to the Public Information Reference Unit of the Environmental Protection Agency as suggested in the Environmental News press release of May 30, 1979.

Thank you for this opportunity to comment. Hope you will advise us if we can be of any further assistance and if any further information is revealed which would be of interest to this organization.

Sincerely,

George W. Fellendorf

George W. Fellendorf, Ed.D.
Executive Director

cc: Luther L. Terry, M.D.

NATIONAL ASSOCIATION OF NOISE CONTROL OFFICIALS

Jesse O. Borthwick
Executive Director

P.O. Box 373
Shalimar, FL 32579
(904) 651-2606

June 27, 1979

Rail Carrier Docket (ONAC 79-01)
Office of Noise Abatement
and Control (AW-490)
U.S. Environmental Protection Agency
Washington, D.C. 20460

79-01-125

Re: ONAC 79-01, Railyard Noise Emission Standards

Gentlemen:

The National Association of Noise Control Officials appreciates the invitation and opportunity to comment on your April 17, 1979, proposed amendment to the existing federal railroad noise emission regulation. As professionals dedicated to the prevention, control, and abatement of environmental noise, we are vitally concerned with the problem of railyard noise, its impact on the public's health and welfare and the lack of relief offered by your proposed action.

For your information NANCO is a non-profit scientific organization supporting environmental noise control. The Association was incorporated in January, 1978 to establish and maintain a forum through which personnel of State and local agencies and other interested parties may unite. The Association's most important aim is to provide a mechanism and opportunities for free exchange of information, discussion and cooperative study of problems confronting its members. While only a year and a half old NANCO has grown rapidly with over 200 members currently active throughout the United States. It is important to note that our members represent themselves as individuals and do not represent the agencies by which they are employed.

On June 7, 1979, NANCO's Board of Directors adopted the attached critique as the Association's official position regarding the technical aspects of your proposed railyard standards. Also attached for submission to the docket are the results of a survey of NANCO's membership regarding the proposed standard. The results reflect the response of 44 Active and 24 Associate Members.

We recognize and appreciate the fact that there are legal considerations which must be taken into account in your final decision. However, we sincerely hope that these legal issues will not blind you to the need for a technically valid and workable regulation which provides the maximum possible relief. We further recognize the severe time restraints under which EPA has been forced to prepare this regulatory proposal and feel that EPA should be commended for accomplishing so much in such a short period of time. However, we cannot help but interpret your proposed regulation as a legalization of railroad noise in this country. We can only hope that your final action will reflect the majority of the comments submitted to the docket which call for a regulation designed to protect the citizens of the Nation as opposed to the Railroads.

NANCO has strongly supported the EPA philosophy that railyard equipment and facilities, other than rolling stock, can best be and should be regulated by State and local noise control agencies. It is indeed unfortunate that your agency is being forced by court order to abandone this philosophy and to promulgate standards whose true purpose is to preempt State and local controls.

Again, thank you for the invitation and opportunity to comment. We look forward to working with you in seeking our common goal, a quieter environment.

Sincerely,

Jesse O. Borthwick
Executive Director

Attachments

A PRELIMINARY CRITIQUE

OF THE

U.S. ENVIRONMENTAL PROTECTION AGENCY'S

PROPOSED RAILYARD NOISE REGULATION

SUMMARY: The following is a preliminary critique of the U.S. Environmental Protection Agency's proposed noise emission regulations for facilities and equipment of the nation's interstate rail carriers as published in the Federal Register on Tuesday, April 17, 1979. These comments have been drafted by a special NANCO review committee made up of John Hector, Bob Hellweg, Jerry Jensen, Jack Swing and Jesse Borthwick. They do not necessarily reflect the views of any State or local agency nor do they represent a formal position by NANCO. They have been prepared in an effort to stimulate and encourage review of the regulation by all interested persons.

ISSUE: Property line standards versus source standards.

COMMENT: The committee feels that EPA should not establish property-line type noise emission standards for railyards or any other sources of environmental noise. Any property-line standards promulgated by EPA would have to be based on worst case or "least common denominator" situations since there are no variance provisions in the Noise Control Act. We don't feel that a standard based on the worst case would be in the best interest of the public health and welfare. Such standards would only serve to legalize existing levels of noise and in the case of railyards actually allow significant increases in noise emissions at yards which are currently "quiet."

Recognizing the restrictions that would be placed on establishing national property-line railroad noise emission standards and the uniqueness of local acoustic environments, the committee would recommend the adoption of receiving property criteria to aid in determining when source controls should be imposed. The following scenario is suggested:

(1) EPA should establish receiving property noise impact criteria which when violated would constitute an impact on the public health and welfare and therefore be considered excessive. Such criteria should be established without consideration for cost of compliance or technology requirements. We would recommend L_{DN} 55 dBA be adopted as the criterion for longterm steady state noise exposure (based on information published by EPA) and that maximum hourly Leq's of 60 dBA (day) and 50 dBA (night) also be established to allow shortterm monitoring. These hourly levels are recommended based on the need to protect against communication interference and sleep interference, and are supported by (i) the data presented in EPA's Appendix V which shows the greatest difference between maximum measured hourly Leq values and L_{DN} values being 4.5 dBA, indicating that the daytime hourly Leq should be set no higher than 5 dBA above the L_{DN} value; and (ii) the need for a 10 dB nighttime penalty. A third set of criteria needs to be established as a measure of intrusive noise, perhaps a maximum $L_{MAX}-L_{50}$ difference or some similar measure.

(2) Once the above criteria are established Federal, State and local enforcement officials can determine where noise impacts exist. When the noise emissions from a given railyard are found to be in violation of the criteria at a receiving noise sensitive site, the next step is to determine whether the noise is necessary. We would define unnecessary noise as any noise which is excessive (violates the criteria) and which has not been controlled using best available technology (BAT) as identified by EPA source standards which includes

administrative controls.

(3) A railyard which is found to be generating excessive and unnecessary noise would be required to bring its noise within the criteria or comply with all EPA source standards through the application of BAT and administrative controls.

This scenario would result in noise abatement only at noise sensitive sites as opposed to requiring abatement on all sources industrywide, thereby reducing drastically the economic impact on industry. We feel it would also encourage the use of administrative controls including cooperation with local planning officials to prevent encroachment and encourage compatible redevelopment.

ISSUE: Through train noise emissions

COMMENT: We feel that through train noise has not been adequately addressed. Existing source standards fail to protect the public health and welfare. We strongly urge that standards for rolling stock be reexamined.

ISSUE: Best Available Technology definition

COMMENT: Best Available Technology should include administrative control. Control considered workable and reasonable should be published by EPA for use by the railroads and enforcing agencies.

ISSUE: Car coupling noise standards

COMMENT: We recommend the car speed criteria be dropped since it will only serve to complicate enforcement. As currently written the regulation would require the monitoring of car speed to document it moving less than 4 mph in order to fully support a violation.

We also recommend that the standard be reduced from 95 dBA to 90 dBA at 30 meters. A minimum of 10 readings all within 10 dBA of the maximum reading should be required. It appears that the 90 dBA standard could be reached through speed controls, especially when the energy averaging of 10 readings is considered.

ISSUE: Retarder noise standards

COMMENT: We support EPA's application of 12 ft. barriers with absorptive lining as BAT. We support the 90 dBA standard but suggest that the measurement criteria be amended to require a minimum of 10 readings, all within 10 dBA of the maximum reading, be used in arriving at the energy average.

ISSUE: Refrigerator car noise standard

COMMENT: The background documentation presents insufficient data to support a review of the standard. However, it does not appear that the use of electric service for compressors as opposed to diesel-generated service was given adequate, if any, consideration. This control approach is currently being used in Orange County, California.

ISSUE: Acoustic environment degradation

COMMENT: The regulation should be amended to include provisions limiting degradation of the acoustic environment surrounding railyards that currently have low level noise emissions.

ISSUE: Land use planning

COMMENT: All railyards should be required to provide noise contours to local planning departments showing current and future noise impact zones, in order to encourage compatible land use planning.

ISSUE: State and local enforcement of the regulation

COMMENT: The measurement criteria are extremely complex and will result in little, if any, enforcement by State and local noise control agencies. We know of no agency that is willing to participate in the enforcement of the regulation as proposed. Even if acceptable standards and measurement procedures are promulgated by EPA, State and local governments will be required to adopt identical regulations before they could become involved in enforcement. This process could prove to be a lengthy if not impossible task in many jurisdictions. Furthermore, we feel that without financial and technical support (training enforcement officials, providing legal advice, equipment, technical consultation, etc.), no State or local noise control agency will be able to successfully enforce against a major rail company.

ISSUE: Measurement criteria

COMMENT: The measurement criteria as proposed are too complex to be considered workable. Modeling out all non-railyard noise sources and through trains as proposed using sophisticated techniques such as the TSC Highway Noise Prediction Method is asking too much. There are currently no integrating sound level instrumentation systems that meet all ANSI Type I specifications due to the lack of specifications for digital readout. Those that meet the Type 1 accuracy specifications are overly expensive and are therefore rarely found in the equipment inventories of State and local noise control programs. Although we recommended earlier against the use of L_{DN} or Leq for enforcement, if L_{DN} and Leq metrics are adopted, a simple statistical measurement procedure using Type II sound level meters and a method of calculating Leq should be established.

ISSUE: EPA Region X Recommendation of non-concurrence

COMMENT: The committee completely concurs with EPA Region X Administrator Dubois' comments as outlined in attached letter.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 10

DATE: FEB 1 6 1979

SUBJECT: Recommendation of Non-concurrence with Draft Railyard Equipment and Facility Regulations Under Red Border Review

FROM: Donald P. Dubois
Regional Administrator

TO: J. Edward Roush, Director
Office of Regional and Intergovernmental Operations

THRU: L. Edwin Coate
Deputy Regional Administrator

L Edwin Coate

We are non-concurring with the proposed railroad equipments' facility regulations currently under red border review. We recognize there may be overriding considerations at the National level; our non-concurrence is therefore based on our concerns about negative impacts on the Region 10 noise program. Our objections to the package are summarized below.

1. The proposed regulations (both 24 and one-hour) are not protective of public health and welfare and are inconsistent with our national noise strategy.

2. Because they are totally preemptive, the proposed standards would prohibit one of our states (Oregon) from enforcing its own standards which are protective of public health and welfare. Enforcement actions taken by Oregon using their more stringent standards have not resulted in placing an unreasonable economic burden on the railroads in order to achieve compliance. We understand Illinois has also been enforcing more stringent standards.

3. The regulations will allow degradation in the noise climate around some existing railyards.

4. The draft regulation proposes a one-hour standard which is inconsistent with measurements made in Region 10 and by Regions 4, 6, and 8. These measurements were taken to provide data to support the regulation development. From our data, our worst one-hour level was within 5 dB of the 24 hour levels. The regulation proposes a one-hour daytime level 14 dB higher than the 24 hour level. We cannot see the justification for such a high one-hour level and recommend a more reasonable level be established based on real world measurements.

Donald P. Dubois

EPA Form 1320-6 (Rev. 3-76)

A SURVEY OF NANCO MEMBERS ON FEDERAL PROPOSED RAILYARD NOISE EMISSION STANDARDS

(NANCO recently conducted a survey of its members regarding EPA's proposed railyard noise emission standard. Results, along with individual statements, will be used in preparing the Association's comments on the regulation. Survey questions and responses, in percent, are presented below. The first percentage figure shows response of Active Members, the second that of Associates.)

1. How serious a problem is railyard noise in your State/Community?

% 16-5 Complaints non-existent
41-18 Ocasional complaints
34-18 Regular complaints
16-2 Organized citizen action

2. If railyard noise is a problem in your State/Community what are the primary sources of noise?

% 61-18 Engine noise from locomotives and switch engines
27-2 Retarder squeal
39-0 Refrigerator car noise
55-7 Idling locomotives
48-14 Car-coupling noise
2-0 Load cell testing, repair facilities and locomotive service area noise.
25-16 Wheel/Rail noise
48-14 Horns, bells, whistles
7-0 Trailer on flat car, container on flat car
7-2 Other (dumping and shaking; coal car shakers)

3. Do you agree that EPA should become involved in setting property line type noise standards?

% 30-7 Strongly agree
18-20 Agree
11-7 Undecided
14-9 Disagree
27-9 Strongly disagree

4. What type of railyard noise standards do you feel EPA should adopt?

% 20-11 Property-line standards
34-11 Source specific standards
39-27 A combination of property-line and source standards
7-2 No standards

5. If EPA promulgates property-line noise standards which of the following receiving land uses do you feel should be protected?

% 11-2 All lands
18-7 All developed lands
2-5 Residential properties only
70-43 Residential and other noise sensitive properties (churches, schools, etc.)
2-0 Commercial properties only
5-5 Other (vacant zoned residential; public use areas)

6. If property line standards are adopted by EPA for railyard noise, which of the following descriptors would you consider most appropriate for enforcement?

% 34-16 LDN
30-20 Leq (hourly)
5-2 Leq (24 hour)
7-2 Octave Band
30-7 LMAX (hourly)
25-14 L10 (hourly)
16-9 L50 (hourly)
9-5 LMAX - L50 (or similar measure of intrusiveness)
7-5 Other (impulse noise; 3-5 dB maximum increase in existing LDN)

7. Assuming EPA sticks with LDN as the descriptor for property-line noise enforcement, which of the following standards would you consider most appropriate?

% 11-5 75 dBA
16-5 70 dBA
20-20 65 dBA
20-9 60 dBA
32-7 55 dBA
5-5 Other (day 65 Leq, night 50 hourly Leq)

8. If EPA promulgates an acceptable set of noise standards will your agency be willing to enforce them?

% 45-9 Yes
30-5 Yes, but only with federal financial and technical support
11-2 No

9. Does your equipment inventory currently include an integrating sound level meter, or instrumentation system, that is capable of measuring Leq or LDN and that meets ANSI S1.4-1971 requirements for Type I Precision Sound Level Meters?

% 57-18 Yes
36-14 No
5-2 No, but willing to purchase

10. Do you feel that the railyard noise measurement criteria as described in Subparts C and D of the April 17, 1979, Federal Register are:

% 0-2 Overly simple
2-2 Simple
16-11 Workable
30-25 Complex, but still workable
36-2 Complicated beyond reason and totally unworkable.

Air is Part of the Total Environment

METRO CLEAN AIR COMMITTEE

1829 PORTLAND AVENUE, MINNEAPOLIS, MINNESOTA 55404 • 871-7332

June 27, 1979

Rail Carrier Docket (ONAC 79-01)
Office of Noise Abatement and Control (AW-490)
U.S. Environmental Protection Agency
Washington, D.C. 20460

Gentlemen:

I am writing to you as Chairman of the Metro Clean Air Noise Committee, which is made up of representatives of both public and private organizations interested in ensuring a better noise environment in the metropolitan area and the state of Minnesota. We have sponsored seminars in community planning in noise for local officials from around the state and for law enforcement officials. The committee also reviewed and commented on the State Noise Standards before they were adopted, and has been involved in the development of a number of community noise ordinances.

79-01-129

The members of the Metro Clean Air Noise Committee feel that the development of property-line (receiver) standards are inappropriate for the US EPA, which should be concentrating on the development of emission standards for products or facilities. "Property-line" standards may be acceptable if they address the maximum allowable emission level at the property line of the noise source.

In terms of enforcement or control, the Ldn concept is of little use. It is a measure of environmental exposure but does not account for many of the problems that must be faced in enforcement situations, such as the prevention of sleep, annoyance during certain periods, and other problems which are associated directly with railroad activities in many major cities.

It is unclear as to whether the US EPA is attempting to develop a standard which is inherently difficult to enforce. We would prefer to see a more easily understandable limitation on emission from railroad activities. Once this is accomplished, local authorities can determine for each situation if the operation of the railroad is damaging to the health and welfare of its citizens.

Thank you for this opportunity to comment on the proposed rules.

Yours truly,

David Braslau

David Braslau
Chairman

DB/da

MSHA

Minnesota Speech and Hearing Association

State Organization Service
319 15th Avenue Southeast
Minneapolis, MN 55455

24 May 1979

Rail Carrier Docket ONAC 79-01
Office of Noise Abatement and Control (ANR-490)
US Environmental Protection Agency
Washington, DC 20460

re: Railroad Noise Control at the Expense of Local Environmental Quality

77-01-053

Dear Sir:

Our association is the local professional group of audiologists and speech-language pathologists. Our role is one of serving the communicative needs of those having hearing, speaking, or understanding problems, essentially, but our role is rather complex. We communicative health care practitioners are concerned with individuals having communicative problems and with the circumstances and environments in which the problems present. Naturally we have much interest in environmental noise problems because of what noise does to the human being and to his/her communicative skills. This letter represents the views of one individual in these matters, however, and does not necessarily represent the thinking of all our members or of the association.

Minnesota has been an environmentally active state in controlling the output of noise sources. It is our understanding that EPA is now in the process of promulgating rules which would take railroad noise control from the states and make railyard noise the prerogative of the federal bureaucracy. The activity of the state, we suspect, would be replaced by the lethargy of a verbose federal department which historically has been great on words but has been less on actions to support the quality of life on the local level, and indeed appears not to have adequate staff to enforce its own regulations once promulgated. We suspect that distant Washington will continue to have its "better ideas" which will only hurt our citizens in Minnesota and their quality of life. We know from our experience with the FDA rule one hearing aids, for instance, that the bureaucracy knows or cares little for meaningful state laws which address and protect local concerns.

We would encourage EPA to request Congress to mandate local control over local fixed noise sources and to specifically prohibit the federal government from intervening in state regulations over fixed noise sources such as railyards. At the least, we would feel EPA would be better off challenging the court order requiring its proposed rule usurping state control of local noise sources.

Thank your for this opportunity to comment.

Sincerely,

Anne Seltz, MA, CCC-Audiology
MSHA President

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RAIL CARRIER DOCKET NO. ONAC79-01

COMMENTS OF THE RAILWAY LABOR EXECUTIVES ASSOCIATION ON THE ENVIRONMENTAL PROTECTION AGENCY'S PROPOSED RAILROAD NOISE STANDARDS

These comments are submitted by the Railway Labor Executives Association (RLEA) in response to the Environmental Protection Agency's (EPA) Notice of Proposed Rulemaking setting out noise emmission standards for railroad yards. That Notice was published in the Federal Register on April 17, 1979.

The RLEA represents all of the railroad workers in this country. The names of RLEA's constitituent organizations are as follows:

American Railway Supervisors' Association
American Train Dispatchers' Association
Brotherhood of Locomotive Engineers
Brotherhood of Maintenance of Way Employees
Brotherhood of Railroad Signalmen of America
Brotherhood of Railway, Airline and Steamship Clerks, Freight Handlers, Express and Station Employees
Brotherhood of Railway Carmen of the United States and Canada
Hotel & Restaurant Employees and Bartenders International Union
International Association of Machinists and Aerospace Workers
International Brotherhood of Boilermakers, Iron Shipbuilders, Blacksmiths, Forgers, and Helpers
International Brotherhood of Electrical Workers
International Brotherhood of Firemen and Oilers
International Organization of Masters, Mates and Pilots of America
National Marine Engineers' Beneficial Association
Railroad Yardmasters of America
Railway Employees' Department, AFL-CIO
Seafarers' International Union of North America
Sheet Metal Workers' International Union
Transport Workers Union of America
United Transportation Union

79-01-133

RLEA is vitally concerned with the proposed noise emmission standards insofar as those standards will affect the workers its members represent. We are extremely dissappointed that EPA did not consult with rail labor prior to issuing the proposed rules. This failure is particularly disturbing because EPA was in frequent communication with the Association of American Railroads before issuing the proposal. Had EPA consulted rail labor, serious shortcomings in the proposal could have been avoided.

The noise produced in railroad yards adversly affects two separate groups: people living near the boundaries of the yard and railroad employees who work inside the yards, close to the noise sources. EPA originally determined that the impact of noise on the first of these groups is an essentially local problem which should not be regulated at the federal level. This position has some merit. The impact of noise on the second group is, however, a serious problem of nationwide proportions. It can best be remedied by effective occupational health regulations promulgated at the federal level and supplemented by state and local rules when necessary. Unfortunately, the regulations EPA has proposed will not give railroad workers the protection they need and may deprive them of other sources of protection, both state and federal. The remainder of our comments are devoted to (1) explaining the inadequacy of the regulations as proposed by EPA to protect railroad employees from on-the-job noise hazards;

(2) demonstrating how promulgation of those regulations will deprive employees of other potentially available protections against noise; and (3) suggesting possible solutions to this problem.

1. The noise control standards which EPA has proposed are neither intended nor adequate to protect railroad employees from the health hazards posed by having to work in noisy railroad yards. We are confident that the EPA does not need to be reminded of the importance of protecting workers from the health hazards posed by excessive noise levels. In the "Background Documents for Proposed Revisions To Rail Carrier Noise Emmission Regulation," February 19, 1979, EPA accurately describes the injuries human beings suffer when subjected to high noise levels See, pp. 6-2 to 6-3. EPA's description of "noise-induced hearing loss" is particularly poignant to those who know railroad workers suffering from this problem:

> The best-known noise effect is probably noise-induced hearing loss. It is characteristic of noise-induced hearing loss that it first occurs in the high frequency area of the auditory range which is important for the understanding of speech. As a noise-induced hearing loss develops, the sounds of speech which lend meaning become less and less discernible. Eventually, while utterances are still heard, they become merely a series of low rumbles, and the intelligibility is less. Noise-induced hearing loss is a permanent loss for which hearing aids and medical procedures cannot compensate.

Id., at p. 6-2. If people living and working outside the railroad yard need protection against this and other noise inflicted injuries, railroad employees who must work inside the yard obviously are in greater need of protection.

The rules EPA has proposed are, however, designed to protect not railroad workers but only persons living or working outside the yards. Such a standard can be described as a general environmental regulation which is designed to limit noise pollution of the environment around railroad yards. It must be distinguished from occupational health or safety regulations which are designed to protect the employees who must work close to the sources of the noise. Both the preamble to EPA's proposal and the Background Document explicitly state that the proposed regulation is only aimed at protecting those people outside the yard and does not attempt to assess or deal with the noise impact on those who must work in the yard. See, e.g., Background Document at pp. 6-1 through 6-62.

Since EPA's standard is not designed to protect workers, it is not surprising to find that the rules contained in that standard are inadequate to that task. The essence of the proposal is the limit set on the average noise level measured on occupied property outside the limits of the yard (the receiving property standard). Such a limit on the noise received outside the yard is of little value in protecting workers who work inside. Furthermore, that limit can be met, in part, through the use of baffles and barriers which will reflect sound back toward the men working in the yard, thus exacerbating the problem for them while reducing it for the surrounding community. Finally, where there is no occupied property in the vicinity of the yard, the receiving property noise limitation is inapplicable even though railroad employees still have to work inside the yard limits. The receiving property standard is thus of little value in protecting workers in the yard.

Even the specific source stanards in the proposed regulations are inadequate. The standard for retarder noise is a particularly troubling example. EPA proposes that the "highly audible and annoying screech" admitted by retarders be limited to no more than 90 dB measured at a point 30 meters away from the retarder. This standard is ineffective for two reasons. First, the noise level permitted is too high. Second, the measurement should be made in close proximity to the retarder, where railroad workers often have to perform their daily tasks. It is of little value to a man working next to a retarder to be assured that the noise level is no more than 90 dB at a point 30 meters (nearly 100 feet) away.

Finally, many sources of noise which cause problems for railroad workers in the yards are unregulated by the standard. There are no specific source limitations for the numerous pieces of maintenance of way equipment which make considerable noise, or the locomotive testing and repairs facilities, to mention only two. Employees exposed to these noise sources receive virtually no protection from EPA standards.

We are aware that EPA decided, in formulating the proposed regulations here involved, to write a general environmental regulation and not one designed to protect occupational safety and health. This decision may, however, seriously impede our effects to obtain noise protection for railroad workers.

(2) If EPA promulgates as a final regulation the proposal it has made regarding noise emmission standards for railroad yards, it will not only fail to protect railroad employees adequately but it will also run a serious risk of depriving them of other available protections. The Association of American Railroads (AAR) brought the case of Association of American Railroads v. Costle, 562 F.2d 1310 (DC Cir. 1977), for the explicit purpose of forcing EPA to promulgate rules which, under the pre-emption provisions of the Noise Control Act of 1972, would free its members from having to comply with state and local noise control rules and ordinances. The AAR and its members can be expected to use the rules EPA promulgates to the maximum extent possible in their efforts to avoid having comply with other noise control rules, both state and federal. The following paragraphs suggest some of the arguments they may make.

First, the railroads can be expected to assert that, once the EPA rules are promulgated, they are no longer subject to general environmental noise control rules established by state and local governments. They will probably argue not only that the EPA rules supplant state rules dealing with the same specific subjects as do the EPA rules (i. e., property line limits on yard noise and specific source rules on retarders, refrigerator cars and coupling noise), but also that they are free of the duty to comply with State rules governing any specific source within the yard, on the theory that EPA has regulated the entire "facility" known as the yard. We believe that the latter portion of this argument is invalid, but nevertheless expect the railroads to pursue it vigorously.

Second, the railroads will probably also claim that EPA's proposed staandard will free them from the obligation to comply with state and local occupational health regulations governing railroad noise. Several states, including California, have valuable regulations affording railroad workers protection from some of the injurious effects of the noisy environment in which they must work. The contention that EPA's regulation pre-empts such state rules is, in our view, invalid because the EPA rule is a general environmental regulation that should not be held to displace specific occupational health rules. Nevertheless, the railroads will pursue their position vigorously and their doing so can be expected to achieve, at a minimum, delay and confusion in state enforcement.

Third, the railroads will undoubtedly argue that the proposed EPA noise standards for railroad yards ousts the Labor Department from jurisdiction over noise problems in railroad yards under the Occupational Safety and Health Act (OSHA). Section 4(b)(1) of that Act provides:

> Nothing in this chapter shall apply to working conditions of employees with respect to which other Federal agencies, ..., exercise statutory authority to prescribe or enforce standards or regulations affecting occupational safety or health.

29 U.S.C. §653(b)(1). We believe that the Labor Department would continue to have jurisdiction under OSHA despite promulgation of the proposed EPA regulations because, as we have pointed out, those regulations are not occupational health or safety regulations and therefore do not "affect occupational safety or health." The railroads, however, can be counted on to argue to the contrary. See, e.g., Southern Pacific Transportation Co. v. Usery, 539 F.2d 386 (5th Cir. 1976), cert. denied, 54 L.Ed. 2d 154; Southern Railway v. OSHRC, 539 F.2d 335 (4th Cir. 1976), cert. denied, 429 U.S. 999 (1976); Baltimore and Ohio Railroad v. OSHRC, 548 F.2d 1052 (D. C. Cir. 1976). The result will be considerable litigation and delay in enforcing any applicable OSHA standards.

Fourth, we see no ground on which the railroads could argue that promulgation of EPA's proposed rules on railroad yard noise could oust FRA from jurisdiction over yard noise as an occupational health or safety problem. We do recognize, however, that FRA has no rules governing this problem at the present time and that a request to FRA to establish such rules would be met, after promulgation of EPA's rules, with the objection from the railroads that "EPA is already regulating the subject".

As the foregoing should establish, promulgating the present EPA proposal as a final regulation would be extremely unfortunate. The protection of communities surrounding railroad yards from the noise generated by those yards is often a local problem which may not merit nation-wide, federal regulation. On the other hand, the protection of railroad employees from noise in railroad yards is a nation-wide problem that should be dealt with at both the federal and state levels. The proposed EPA regulations would, however, create a substantial risk that neither the states nor the federal government will be able to deal with that problem adequately. In the next section, we suggest several ways to avoid this situation.

3. We recognize that the EPA is constrained by the Costle decision and that it must conform its actions to the requirements of that decision. Nevertheless, we believe there are several possible courses which EPA could adopt to avoid or reduce the adverse impact of its regulations on employee health in the railroad industry.

First, the regulation could be completely revised and recast as an occupational health standard rather than a general environmental rule. While protection of people living around yards may be a local problem, protection of railroad workers within the yards is a nation-wide problem meriting federal as well as state attention. The EPA has jurisdiction and authority to promulgate regulations designed to protect railroad and other workers from the adverse affects of noise. Section 2(b) of the Act declares that "it is the policy of the United States to promote an environment for all Americans free from noise that jeopardizes their health or welfare". 42 U.S.C. §4901(b). The term "all Americans" indisputably includes those who earn their livings in noisy environments, such as railroad yards.

Furthermore, we believe that recasting the instant proposal to protect railroad workers rather than the persons living in the vicinity of railroad yards is consistent with both the Costle decision and Section 17(a)(1) of the Noise Control Act of 1972. That section and the Court's decision in Costle require EPA to promulgate noise emmission standards for "the equipment and facilities" of railroad carriers. Section 17(a)(1) also requires that those regulations set limits which reflect the degree "of noise reduction achievable through the application of the best available technology, taking into account the cost of compliance." Neither the statute nor the Costle decision, however, specify what population EPA must design the regulations to protect. In its Notice of Proposed Rulemaking, EPA has chosen to protect persons living near the boundaries of railroad yards and to ignore protection of the persons who work in the yards. We suggest that EPA would use its discretion more wisely if it chose to define the class of persons to be protected as those who work in railroad yards. Selection of the class of persons to be protected by federal regulation is a decision within EPA's discretion and exercise of that discretion to focus protection on railroad workers should be upheld by the courts.

Of course, the standards contained in the Notice of Proposed Rulemaking will have to be revised to make them effective occupational health noise standards. Inadequate occupational noise regulations would be worse than none at all. They would prevent other agencies from providing adequate standards. Also, if EPA leaves the problem of noise impacts on citizens living near railroad yards unregulated it should provide a means for permitting local jurisdictions to regulate that problem in appropriate situations. This result can be achieved by promulgation of regulations under §17(c)(2) seting out criteria under which the Administrator would approve appropriate local standards.

Second, rather than recasting the present rules exclusively as occupational protection for railroad workers, such occupational protection can simply be added to the present proposal. EPA has jurisdiction to do so as explained in the preceeding paragraphs.

Third, EPA could leave the proposed rules essentially as they are but include in the preamble a clear statement interpreting those rules and the Noise Control Act (1) as not preventing the states from promulgating and enforcing noise control standards relating specifically to protection of workers from occupational health hazards, including noise, and (2) as not ousting OSHA from jurisdiction over noise protection for railroad workers. The latter of these two objectives is not difficult to achieve. The preamble should contain a statement that EPA does not consider its railroad yard noise regulations as "affecting occupational safety or health" within the meaning of §4(b)(1) of OSHA. We believe the courts would abide by this interpretation of the regulations by the agency that issued them and would hold that the Labor Department is not ousted. The preamble should also preserve the right of the states to protect railroad workers from excessive noise levels. A statement from EPA to the effect that its regulations do not adequately cover occupational health protection and that the states should therefore be free to provide such protection would be helpful.

Fourth, the proposed rules coulo be revised to contain only a limit on total noise produced by railroad yards as measured at the property line of the nearest occupied property. This alternative would eliminate the rules setting specific source standards for retarders and other particular pieces of equipment. Such a revision to the proposal should be accompanied by a statement that the rules regulate only total noise coming from the entire facility and leave unregulated, and therefore subject to state regulation, particular sources of noise. The states would then be free to promulgate either occupational or environmental noise control regulations for those specific pieces of equipment.

We feel the first of these four alternatives corrects both the major problems of the present regulation: (1) Federal regulation of an essentially local problem and (2) no regulation of the important problem of railroad employee exposure to excessive noise levels. We urge EPA, whether it accepts our first proposal or some other solution, to do all it can to insure that its railroad noise regulations do not rob railroad workers of essential protection against the noisy environments in which they have to work.

Respectfully submitted,

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