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The U.S. Environmental Protection Agency's Proposed Revised Noise Emission Regulation For Interstate Rail Carriers

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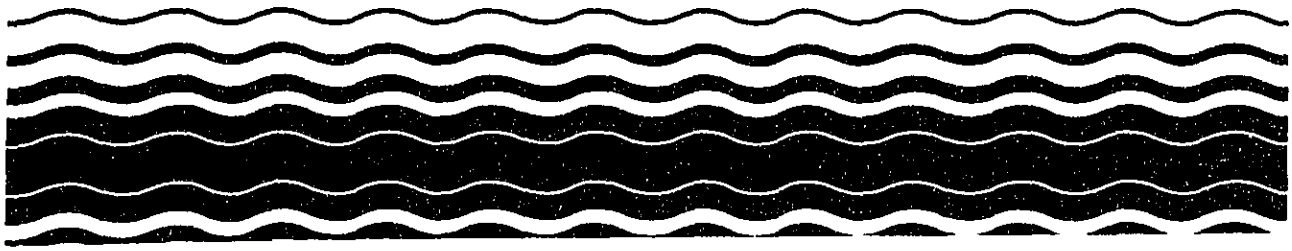

By
Dr. William E. Roper
Office of Noise Abatement and Control

PROPOSED REVISION TO RAIL CARRIER NOISE EMISSION REGULATIONS

I. INTRODUCTION

The U.S. Environmental Protection Agency (EPA) has proposed revised railroad noise regulations that by 1982 would extend Federal noise controls to most interstate railroad equipment and facilities.

The new regulations were ordered by the U.S. Court of Appeals (D.C. Circuit) in August 1977 as a result of a suit brought by the Association of American Railroads (AAR) on behalf of the industry. The AAR successfully argued before the Court that EPA's original regulations (December 1975) covering just locomotives and rail cars were not as comprehensive as Congress had intended in Section 17 of the 1972 Noise Control Act. According to the AAR, the Act did not confer on EPA the discretion to "pick and choose" which aspects of the railroad industry to regulate, but required instead that the Agency "...issue noise emission standards for all railroad equipment and facilities...." Further, the Association contended before the Court that it was Congress' intention to "...establish a Federal regulatory program that would completely preempt the authority of State and local jurisdiction(s)...." These two matters are closely linked because the Act, in establishing preemption, specifies that State and local governments may not adopt or enforce any standard for equipment or facilities covered in the Federal regulations that is not identical to the Federal standard. (An exception being a waiver provision for "special local conditions" subject to Federal approval.) Thus, the coverage of Federal regulation determines the extent of preemption. Under EPA's original regulations, State/local governments were free to set their own standards for railroad equipment and facilities (other than locomotives and rail cars). Consequently, the purpose of the AAR suit was to obtain for industry, through complete Federal regulatory coverage of railroad noise sources, full preemptive protection from what they viewed as proliferating State/local regulations. Of apparent concern were costs and litigative burdens potentially incurred by their members in complying with differing, and possibly conflicting, local noise ordinances.

In defense, EPA contended it did have the discretion to limit the scope of its actions to the degree exhibited in the original regulations. Among other things, the Agency pointed to two determinations of the Act: (1) primary responsibility for control of noise rests with State and local governments; and (2) Federal action is essential to deal with major noise sources that are involved in [interstate] commerce and require a national uniformity of treatment. Further, EPA noted that the preemption provisions of Section 17 focus only on those State/local regulations which attempt to control the same equipment or facilities covered in the Federal regulations. These determinations, in conjunction with other features of the Act and its legislative history,

indicated to EPA that Congress intended that preemption of State/local authority be limited and further that Federal control should center on those items of the railroad industry truly in need of the uniform treatment offered by a national standard.

Consequently, EPA limited its regulation to locomotives and rail cars (rolling stock), the only equipment of interstate rail carriers that actually moves from jurisdiction to jurisdiction and for which variations in local requirements might prove burdensome or an impediment to commerce. On the other hand, fixed equipment and facilities were not subject to changing jurisdictions and, in EPA's opinion, did not need the protection afforded by a national standard. In fact, the Agency found, in assessing a variety of situations, that this portion of the industry could be most cost-effectively regulated at the State/local level where (if problems were serious enough to justify passage of ordinances) requirements could be tailored to the real and practical noise abatement needs of each situation. Thus, in general, EPA believed that railroad noise could best be approached by a combination of Federal and local actions.

The Court, after considering all issues, concluded that EPA did not have the level of discretion it exercised and ruled in favor of the AAR. The Court ordered the Agency to "...broaden the scope of its regulations, by defining 'the equipment and facilities' of interstate rail carriers in a manner consistent with the usual and customary understanding of the phrase in the railroad industry." The Court did not order EPA to regulate all railroad equipment and facilities --- a task that would have been extremely difficult and undoubtedly very costly to the industry --- nor did the Court determine specifically which equipment and facilities the Agency should include in its final regulations.

EPA has interpreted the Court ruling to mean that the original regulations needed to be broadened to include railroad noise sources in addition to locomotives and rail cars. Railroads can be thought of as having two principal components: rail yards and interconnecting rail lines. EPA's 1975 regulations covered rail lines by setting noise standards for locomotives and moving rail cars. These standards were not challenged in the AAR suit and, as a result, continue in effect. Hence, the Agency's efforts in complying with the Court's directive have focused on establishing necessary and reasonable standards for the remaining railroad component: rail yards.

II. IMPLEMENTING THE COURT ORDER

Following the Court's decision, EPA immediately initiated technology, economic, and health and welfare studies to collect the additional information and data on which to base the revised regulations. The studies and public participation took almost the full year the Court

allowed in its ruling. As of July 1978 the Agency had compiled technical and other data in a draft background document, draft language for the proposed regulation, and an environmental impact statement. However, EPA concluded that further data collection and evaluation were essential. Therefore, on August 18, 1978, the AAR and EPA filed a joint motion in the U.S. Court of Appeals to obtain time to collect and analyze additional data and to make appropriate revisions to the draft documents. The Court granted the request for a six-month extension, thereby establishing February 23, 1979, as the date for publication of the final revised regulations. This was subsequently extended to July 23, 1979 as a consequence of a second AAR/EPA joint request.

During the initial six-month extension, EPA added to its data on many railroad noise sources and concentrated on expanding the information base in the following areas: cost of noise control, rail facility noise impact on people, rail facility noise control technology, and the economic status of the railroad industry. In evaluating the technical feasibility of meeting specific property-line limits at railroad facilities, EPA focused on rail yards.

The Agency's study of railroad facilities revealed that there are in excess of 4,100 railroad yards in the U.S. Therefore, it was not possible or practical to conduct an analysis of each facility. Instead, EPA separated facilities into hump yard, flat classification yard, industrial yard, and small industrial yard categories, and attempted to characterize representative or "typical" individual facilities for each category.

EPA has made every effort during the time available to gain a thorough understanding of railroads and their problems. The Agency collected and analyzed data and information from many sources. Though limited information was made available by the industry itself, much came from published studies and reports done by DOT/Federal Railroad Administration (FRA) and other Federal agencies, Congress, and contractors (both for the industry and the Government). EPA staff visited numerous rail facilities and conducted noise measurements at over twenty of those deemed representative of the several facility categories. (These facilities were selected after consultation with the Federal Railroad Administration and the AAR). In addition, an unprecedented study, involving hundreds of U.S. Geological Survey maps and aerial photographs (imagery), was conducted. EPA consulted with over 100 local officials to gain a better prespective of railroad noise problems as they directly affect the public. This effort has been one of the most extensive of its type done to date and, in EPA's opinion, provides an adequate base for proposing general nationwide standards.

EPA's high-altitude photographic (imagery) study should be given special note. Some 120 representative railroad facilities were the subject of this unique and thorough study conducted by the Agency's Environmental Photographic Interpretation Center. The basic resource

for this effort was the large Federal remotely sensed data libraries of NASA, U.S. Bureau of Land Management, U.S. Geological Survey, and others. In addition, some supplemental data were gathered in photographic missions flown by camera-pod equipped aircraft under EPA contract for the purpose of resolving uncertainties and providing backup on selected facilities.

All data, in the form of visual spectrum (black and white, color) and thermal infrared imagery taken from 1972 to 1978 on the above sites, were converted to transparencies. Then transparent overlays were made from the combined information of the imagery, camera-pod photographs, ground-level photos, site visits, and other sources. All overlays were then subjected to a state-of-the-art analysis to determine rail yard boundaries, land uses out to 2000 feet from these boundaries, noise sources and their locations within the yards, and other relevant parameters. The level of detail (and in some instances the types of information) obtainable in this approach is much superior to that from maps or virtually any other source. This study of rail yards is, to EPA's knowledge, unprecedented and constitutes an efficient and cost-effective use of the wealth of information gathered in other Federal programs.

III. TYPES OF RAIL YARD NOISE

Noise resulting from rail yards is a complex mixture of sounds generated by many different pieces of equipment and operations. Before determining standards, EPA first had to identify the specific sources and operations causing the noise. From its studies, the Agency has concluded that the majority of complaints from individuals affected by noise from rail yards is due to the following important sources:

- o Locomotives and switch engines
- o Retarders (both active and inert)
- o Refrigerator cars
- o Car coupling
- o Load cell testing, repair facilities, and locomotive service
- o Wheels/rails
- o Horns, bells, whistles.

IV. THE PROPOSED REGULATIONS

Writing source-specific standards for every piece of equipment and every type of rail facility was not practical because of the many possible combinations and dispositions of equipment used at the thousands of railroad yards around the country. EPA therefore decided to develop a property-line standard which would set a limit on the average total level of noise reaching "receiving property" across the boundary of a railroad facility. However, because a receiving-property approach did not assure adequate control for certain sources, EPA decided to develop specific noise emission limits for two pieces of equipment: retarders and refrigeration cars, and one rail yard operation: car coupling.

In the process of developing the proposed regulations, more than 100 combinations of lead times and noise control levels were investigated. The various combinations were then narrowed to five principal options. These were then weighed and EPA's judgement is reflected in the proposed standards which follow.

A. Overall Facility and Equipment Noise

Starting January 1, 1982, EPA proposes that noise levels at a receiving property at or beyond a rail yard boundary line not be permitted to exceed 70 L_{dn}. After January 1, 1985, the standard would be reduced to 65 L_{dn} for hump yards only. To facilitate enforcement of the receiving-property standard, EPA also proposes an hourly equivalent sound level, L_{eq}. Starting January 1, 1982, all rail yards will have to meet a daytime 1-hour L_{eq} of 84 and a nighttime value of 74. After 1985, hump yards only will be required to meet a daytime level of 79 and a nighttime level of 69.

The L_{dn} is a noise descriptor involving an average day-night noise energy level. Sound level measurements are taken over a 24-hour period and the average noise energy calculated, after 10 dB is added to all nighttime noise levels. This so-called weighting of nighttime noise is done because of the greater intrusiveness of sound during such periods and to protect people from sleep disturbance, one area of greatest citizen complaint. Thus corrected, the L_{dn} value gives a better picture of true noise impacts on people than would non-weighted types of descriptors.

The other noise descriptor used in EPA's regulations, L_{eq}, is an equivalent sound level. It is also an average noise energy level, but EPA has chosen to key it to a one-hour measurement period. Separate L_{eq} levels are then specified for daytime and nighttime and a table provided which indicates the appropriate L_{eq} limits if measurements are taken over longer periods (i.e., periods which represent selected multiples of the one-hour base). Further, the one-hour and other L_{eq} limits are set so that if a railroad facility emits noise in excess of a given L_{eq} limit, it is certain also to exceed the L_{dn} limit. The L_{eq} descriptor is included to ease burdens on State/local governments by allowing some flexibility in the way they can approach noise measurements for compliance and enforcement purposes.

The property-line standard sets a limit on the average total (collective) level of noise reaching "receiving property." So that abatement costs are not imposed where noise does not affect people, compliance with this limit will be necessary only on "developed" property adjacent (adjoining or nearby) to rail yard facilities. Property that is owned or controllable by a railroad company is excluded, except where there are occupied residences situated on such land. Further, special limitations and/or noise measurement requirements are imposed in situations where railroad originated noise is not the "dominant" component of the total environmental noise from all sources.

Since the receiving-property standard was developed on the basis of "typical" rail facilities, there are likely to be some "atypical" facilities which will have more difficulty complying with the standard than others. One approach to the noisier-than-average facility problem could be a case-by-case assessment and amendment of the regulations. However, the Act provides no authority to grant exemptions from the regulation or extensions of time for individual companies to bring their facilities into compliance. The property-line approach does have the advantage in giving railroad companies some flexibility in the manner of abating specific sources in a yard to meet the limits on total noise.

B. Retarder Noise

Starting January 1, 1982, EPA proposes that active or controlled retarder noise levels not be permitted to exceed 90 dB (on an A-weighted scale) at a distance of 30 meters. An active or controlled retarder is a braking device used during classification operations in hump yards to slow down coasting rail cars by causing a clamping action on the rail car's wheels. This process causes a high intensity (approximately 110 dB), high-pitched screech which is very annoying and intrusive. Though retarders are generally in use at all hours of the day or night (in other words, when the hump yards are operating), a receiving-property limit based on an average level of noise at the yard would not adequately control this noise. This is because retarder noise is of very short duration, and is intermittent in nature. Thus, EPA has determined that regulation of retarder noise requires a specific source emission standard. Compliance with the proposed 90 dB (A-weighted) standard would reduce retarder noise by 20 dB or more on the average.

C. Refrigerator Car Noise

Starting January 1, 1982, EPA proposes that mechanical refrigerator car (reefer) noise not be permitted to exceed 78 dB (on an A-weighted scale) at a distance of 7 meters. Noise associated with these cars can cause serious noise problems, particularly at night, on property adjacent to rail yards and rail line sidings. This is due to the incessant drone of their diesel-motor driven refrigeration equipment -- equipment that must be operated continuously to prevent damage to perishable goods, such as foodstuffs. Further, the problems can be compounded when large groups of refrigerator cars are parked together (a common practice) under the above circumstances. One way to deal with this is to put the cars in locations removed from sensitive receiving-property. However, in some cases this might not be possible or would severely disrupt yard operations. As such, relocation could be an expensive or unworkable control technique. A relatively simple, available, and generally less costly noise abatement technique would be the application of effective, energy efficient mufflers on all reefer cars. If all cars were so equipped, no yards would be forced to turn away individual reefers because they were not quiet enough to be stored in areas near sensitive boundaries (such as those near a residential neighborhood).

This approach places the burden of compliance on car owners rather than yard operators. Compliance with the proposed 78 dB standard is expected to reduce mechanical refrigerator car noise by about 10 dB in the noisiest known situation (now about 88 dB).

D. Car Coupling Noise

Starting January 1, 1982, EPA proposes that noise from car coupling operations not be permitted to exceed 95 dB (on an A-weighted scale) at a distance of 30 meters. This requirement would be waived for yards where it is demonstrated that cars creating levels in excess of the standard are not traveling at speeds greater than 4 mph at the point of impact.

Impact noise from car coupling occurs whenever rail cars are pushed or coast into each other. Like retarder noise, the sound from car coupling is of short duration and high-intensity. Likewise, a property line L_{dn} standard based on average noise levels would not adequately control this source, particularly in yards where relatively few couplings might occur in a given 24-hour period. EPA has determined that the noise level produced is directly related to the speed at which cars are coupled. Almost all railroads already have operating rules or employee irstructions to keep such impacts at no more than 4 mph for safety and to protect cargo from damage. From EPA's studies, 95 dBA has been determined as the maximum sound level for coupling operations at this speed. Thus, continued adherence by train crews to the industry practice of 4 mph should allow railroads to meet EPA's 95 dB standard without applying additional technology. Further, EPA is not aware of any present technology available at reasonable cost to justify a limit below 95 dB.

V. RATIONALE FOR NOT REGULATING OTHER SOURCES

EPA has concluded that the following facilities and equipment should not be covered by this regulation: Mainline rail operations; horns, bells and whistles; facilities not directly associated with railroad trackage; and maintenance-of-way equipment.

A. Mainline Rail

The regulation of noise from locomotives and rail cars is the principal approach to the control of noise along the railroads' main lines. EPA could impose more restrictive limitations on locomotives, thus reducing main line noise further than that accomplished by the original regulations. Reductions could also be obtained by imposing aggregate mainline noise levels which could be met by limiting the frequency of train operations or by constructing noise barriers at selected locales.

These options are not presently being considered, however, they could be in the future if EPA finds that the locomotive and rail car regulatory limits contained in our previous regulations are inadequately controlling mainline noise.

B. Horns, Bells and Whistles

Horns, bells and whistles and other warning devices produce a form of noise intended to be heard for safety reasons. Since sound level limits on these sources would strike at the very heart of their function, EPA has not set standards affecting these devices.

C. Facilities Not Directly Associated with Railroad Trackage

Regulations are not being proposed for facilities such as rail carrier owned tug boats, downtown office buildings, micro-wave relay towers, and the like. These items are not considered to be common noise sources forming the typical mix of railroad equipment and facilities.

D. Maintenance-of-Way Equipment

EPA has identified some 17 pieces of equipment, not counting variations, comprising this category. To date, the Agency has been unable to identify clearly the noise levels of the specific pieces of equipment or the collective levels of possible combinations in which they might be used. Without this, the availability of technology or the costs of compliance cannot be determined. Consequently, EPA cannot set a specific aggregate noise limit (such as a not-to-exceed property-line limit circumscribing given maintenance-of-way work situations) or source limits on individual pieces of equipment.

E. Wheel/Rail Noise

Present railroad maintenance practice of grinding car wheels (to assure their roundness) and rails (to assure their smoothness) is one of the principal, currently available methods for reducing moving rail car noise. Continued adherence to the industry safety-related practice of such grinding should minimize wheel/rail noise. In addition, EPA's previous railroad noise regulation, now in effect, addresses this source of noise.

VI. TECHNOLOGY AND COST

A. Technology

According to Section 17 of the Noise Control Act of 1972, and affirmed by the Court, EPA is required to publish noise emission standards which set limits on the noise resulting from the operation of

equipment and facilities of interstate rail carriers. These standards must ..."reflect the degree of noise reduction achievable through the application of the best available technology...." To determine the best available technology, the Agency was guided by the following definitions.

"Best available technology" is that noise abatement technology 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. "Available technology" is further defined to include:

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.

EPA has determined that the technologies or techniques listed below are currently available to control the important sources of noise commonly associated with rail yards. It is these technologies or techniques that have been factored into the Agency's cost of compliance assessments.

Noise Source	Noise Control Technology
Switch Engine Noise	Exhaust muffling and cooling fan treatment.
Retarders (master & group)	Barriers; retarder lubricating and ductile iron shoes.
Inert Retarders	Replacement with releasable type.
Refrigerator Car Noise	Exhaust muffling and partial enclosure.
Load Cell Testing, repair facilities and service areas	Enclose facility or relocate.

With respect to car coupling, EPA has identified speed limitation as a method to control noise. Adherence to industry-recommended car coupling speed limits is expected to assure that this noise is, in general, kept within EPA standards. EPA is not aware of any present technology available at reasonable cost to control this noise.

B. Cost

In setting standards that reflect the degree of noise reduction achievable through the application of best available technology, the Act stipulates that EPA must take "...into account the cost of compliance."

"Cost of compliance" is the cost of identifying what action must be taken to meet the specified noise emission level, the cost of taking that action, and any additional cost of operation, maintenance, and replacement caused by that action.

EPA has estimated the capital investment necessary to apply the available noise control technologies. This investment includes the costs for purchase and installation of needed hardware. Furthermore, compliance costs have also been estimated on an annualized cost basis. These costs were developed from considerations of the elements of capital recovery, including a 10 percent cost of capital and the expected useful life for each type of noise abatement procedure. The annualized costs also include operating costs such as maintenance and fuel.

The total capital cost to the railroad industry for compliance with the proposed regulation is estimated to be approximately $91 million. The total annualized cost for compliance is estimated to be about $27 million industry-wide. It should be realized that the majority of these costs will be spread over more than 56 railroads operating the 2,600 rail yards perceptibly affected by the standard. Slightly more than 60 percent of these costs fall on firms owning hump yards.

VII. ECONOMIC IMPACT

A. Industry - wide

EPA has conducted several extensive economic studies to determine what would happpen to the industry in applying these proposed comprehensive rail rail yard regulations. This included an examination of potential impacts on numerous individual companies. The AAR has suggested that the poor financial condition of some companies argues for lenient, virtually status quo, standards for the industry as a whole. While the Agency understands the industry's concerns, issuing regulations on such a basis would be contrary to the underlying intent of the Act and would mean no progress in providing relief for many of those people currently exposed to railroad noise.

The Noise Control Act implicitly assumes that noise reduction will be achieved and that some costs will be incurred in the process. As for financially troubled companies and segments of the industry, the Act provides no special exemptions. EPA is directed to examine the application of best available technology, the cost of compliance, and subsequently, to set standards for the interstate rail carrier industry overall. To do this without giving every consideration to the plight of individual companies, however, would be unrealistic. For this reason, the Agency looked very carefully at the effects on financially marginal and bankrupt companies, the industry as a whole, and weighed these against the availability of abatement technology, reasonable noise reduction expectations and other factors consistent with the Act.

EPA predicts that there will be no significant adverse economic impacts on the industry as a whole in incurring the total capital investment cost of $91 million or the annualized costs of $27 million. These are modest figures compared with the approximately $28 billion net invested by the industry in 1977 and particularly so when compared with the projected compliance costs of Federal noise controls already imposed on competing interstate motor carriers under Section 18 of the Act.

EPA has determined that the imposition of the above costs could result in a 0.4 percent increase in the average unit price of principal freight shipment services. In turn, a decrease in demand of 0.5 percent could result. These estimates were derived from a statistical analysis of the sensitivity of demand to changes in price for rail services and based on assumptions regarding the ability of railroad companies to pass along costs in the form of nigher freight rates. The analysis was directed at identifying the maximum impact that could be expected. As such, the above estimates should be viewed as upper bounds. EPA did not include the benefits to the rail carrier industry of demand shifts resulting from noise regulations already imposed on the competing motor carrier industry through increasingly stringent noise levels on new medium and heavy trucks. Given the above upper-bound estimates, the impact on industry overall is not expected to be significant. This conclusion is underscored by comparing the above EPA projected rate increase due to noise abatement and the seven percent rate increase granted the industry in December 1978 by the Interstate Commerce Commission.

B. Financially Troubled Companies

In examining the economic impacts of applying the proposed regulations, EPA found that projected costs will not generally be distributed uniformly among rail companies across the country. Costs, as might be expected, tend to be distributed in a manner that reflects the type and age of equipment, surrounding land uses, the nature of operations, the layout and disposition of the facilities, and other specifics.

EPA has been especially sensitive to the costs that may be incurred by financially troubled railroads. A separate analysis was conducted to determine the impacts of such costs by looking at selected individual

railroads. In general, abatement costs for the industry are small relative to cash flow or net worth. Obviously, the ultimate impacts on some companies could be greater than on others, particularly where relatively high costs are incurred by financially marginal or bankrupt firms. Only in the case of these railroads did abatement costs appear significant relative to cash flow. However, many of these are switching and terminal companies which are owned by groups of larger rail companies or other industries -- entities that appear to have the financial strength to absorb the costs. In addition, EPA's analyses of impacts on marginal or bankrupt companies did not give credit for any present or future Federal (or State) aid or subsidies. Thus, as with the industry-wide impact assessments, assessments on individual companies tended to look to the maximum possible impacts rather than the likely impacts.

VIII. EMPLOYMENT IMPACT

One phase of EPA's analysis was directed to determining potential impacts on the industry's work force -- presently numbering some 500,000. With certain assumptions, the Agency estimates that price and demand changes could result in a maximum possible reduction in industry employment of 1400. Assuming an approximate employment increase of 200 in industries supplying noise abatement materials and equipment, the net effect is a possible reduction of 1200 employees. Obviously, this number does not reflect any employment effects induced in competing carrier modes.

It should be emphasized again that EPA's analyses are directed to identifying the maximum possible impacts and, in any case, are preliminary. As additional data become available and improvements are made in the economic model, it will be possible to obtain more precise estimates of likely employment impact. However, EPA expects such future refined estimates to be small, if not smaller than present estimates. There are several reasons to believe this. First, the analyses assumed a high sensitivity of demand to unit freight prices. Second, a proportional relationship between railroad revenues and labor requirements was used. Available empirical evidence on the industry indicates that less than proportional reductions in employment versus revenues are likely (particularly for smaller companies). Third, any employment effects will be spread out over the phasing-in period of the regulations and significant lags in any adjustment of the work force may occur, because of industry work rules, union contracts, or other institutional factors. Finally, EPA analyses do not consider any off-setting effects of shifts in demand toward the rail industry occasioned by present or future Federal noise requirements imposed on competing carrier modes.

IX. HEALTH AND WELFARE BENEFITS

The Association of American Railroads has argued that health and welfare should not be considered in setting standards for the industry. EPA does not share this view.

The Noise Control Act of 1972 states 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." Section 17 of the Act directs EPA to set railroad noise standards that reflect the degree of noise reduction achievable through application of the best available technology taking into account the cost of compliance. While that charge does not include a specific balancing of the needs of public health and welfare, it is manifest that the standards cannot and should not be set in a void of information concerning such needs.

First, it is not possible to assess the best available noise reduction technology without having as a guide a noise control objective. There must be a target noise reduction criterion in order to determine how effective technology is in accomplishing the objective.

Second, it is not possible to meaningfully take into account the cost of compliance without having an objective toward which those costs are imposed. The very best available technology is not always affordable. By the same token, the greatest reasonable cost that could be imposed is not always justifiable by the objectives of the regulations. Yet the Noise Control Act does not say that no costs should be imposed upon the industry. Rather, it is inherent in Section 17 that the costs that are imposed for noise control must be reasonable. The only means of judging whether they are reasonable is to scrutinize what they purchase, and the only utility of noise reduction is the protection of public health and welfare.

The impact of the proposed regulations on railroad facility and equipment noise can be expressed as the reduction in the number of people subjected to noise that may jeopardize their health and welfare. The number of people affected depends upon the penetration of the noise into the community and the number of people in proximity to the railroad property. To investigate this impact, EPA selected over 100 railroad yard sites throughout the country and determined population densities and types of land use around the site. These results were combined with the total number of railroad yard facilities by type of yard and predicted noise impact on the population. From the analysis, EPA estimates that there are about four million people in the United States exposed to day-night average railroad noise levels of 55 L_{dn} or greater. An outdoor L_{dn} of 55 dB is the maximum level of noise EPA identified in 1974 as being protective of public health and welfare with an adequate margin of safety.

Compliance with EPA's proposed regulations is expected to provide an environment free from railroad noise that jeopardizes the health and welfare for only about 830,000 people. The remainder of the 4 million people should have some improvement in their noise exposure, although they are not removed from adverse impact. Overall, considering the number of people involved and their respective noise exposures, this regulation will result in a 28.5 percent improvement in the rail yard

noise situation. EPA stopped far short of the degree of protection clearly needed because, based on available information, more stringent limits applied nationally would entail substantially greater costs.

The proposed levels have been compared to generalized dose-effect criteria for different aspects of noise impact. Among the known impacts are the General Adverse Response (in terms of the percentage of those exposed who are "highly annoyed" by noise at a given level), anticipated activity on the part of an affected community such as formal complaints and legal action, outdoor speech interference, and predicted amounts of sleep disturbance. Such impacts are gradually reduced as outdoor L_{dn} values are reduced from about 75 dB (approximately the average current rail facility levels) to 70 and 65 L_{dn}. However, these impacts do not become negligible until outdoor values of 55 L_{dn} are reached.

X. ENFORCEMENT

Although EPA believes the expanded regulations are consistent with the Court's directive and the Act, the Agency remains concerned about the degree to which State/local authority will be preempted. Due to certain provisions of Section 17, once final Federal regulations become effective, State/local freedom to independently solve railroad noise problems will be essentially eliminated. This arises primarily because, after the effective date and with limited exceptions (to be mentioned later), the Act forbids State/local governments adopting or enforcing standards for equipment or facilities covered in the Federal regulations that are different than the Federal standards. Consequently, and again with the limited exceptions, State/local governments will be constrained to control railroad noise sources only to the degree and levels allowed under the final EPA regulations.

Such preemption might not pose too many difficulties, if the Federal rules could be formulated in a manner that adequately addressed each and every local situation. However, because there are many thousands of railroad facilities across the Nation and Federal noise limits must apply uniformly to all, it was not possible to accomplish this. EPA's regulations were developed with the average rail facility (not the atypical) in mind and they are, of necessity, "lowest common denominator" standards. For several alternative Federal noise limits considered, the Agency estimated total national costs using selected individual facilities deemed representative or "typical" of various facility categories. The reasonableness of the limits were judged on the basis of these total national costs. This has meant that, in some cases, abatement techniques that appeared reasonable when applied to one or a few facilities had to be ruled out because they resulted in excessive costs when applied nationally. Hence, while EPA believes some noise abatement will be achieved, the proposed Federal regulations will fall short of providing total relief to communities where rail yard noise is a problem.

Federal preemption begins on the effective date of the regulation. As now proposed, this is January 1, 1982. Under the Act, until the new rules are finalized and take effect, State/local governments could adopt and enforce their own regulations for railroad equipment and facilities (except for locomotives and rail cars which are already covered by EPA's original regulations now in effect). EPA is not advocating such initiatives because expenses to State/local governments and the industry may prove wasted if measures taken under local regulations should subsequently be overturned by the preemptive Federal regulations. However, State/local governments remain free (even after the effective date) to regulate any railroad noise source not covered by EPA's final regulations. This includes horns, bells, whistles, or any other of those sources mentioned previously as excluded, but which may be serious problems in certain locales.

Finally, the Act does allow State/local governments the option to petition EPA for a waiver of preemption, if a local rule is necessitated by "special local conditions" and is "not in conflict" with Federal regulations. EPA proposed regulations on this provision of the Act in February 1977 and they are currently under further review as a result of the August, 1977 court decision.

The Federal Railroad Administration (FRA) is required by the Act to issue rules to assure compliance with the final EPA regulations and they are now drafting them. However, the FRA doubts whether it has the authority or the resources for adequate national enforcement. Thus, since railroad noise is essentially a local problem and Federal enforcement may limited, EPA anticipates that the major enforcement initiatives may have to be taken by State/local governments if the regulations are to be effective. Further, such enforcement in State/local jurisdictions will depend on these governments adopting and actively enforcing standards (for rail equipment and facilities covered in the Federal regulations) which are identical to the standards in the final EPA regulations (as the Act authorizes).

EPA has designed its regulations in a manner that will facilitate adoption and enforcement of identical regulations by State/local governments. In addition, EPA should have the resources to provide State/local agencies with some technical assistance, where necessary, to aid them in their enforcement programs.

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