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RAILROAD CASH FLOW MODEL
SOFTWARE DOCUMENTATION

VOLUME 3

CASH FLOW MODEL PROGRAMMER'S MANUAL

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U.S. Environmental Protection Agency
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16. Abstract (Limit: 200 words)

This manual provides information on how to service the cash flow model. It is written for a user who has some familiarity with standard IBM FORTRAN-IV and the WYLBUR system.

The manual has four sections. The first section discusses the model design through its technical specifications, data requirements and algorithms. The second section defines the data base specifications and defines the data names. The third section is an annotated listing of the program. The fourth section describes verification and test procedures for the model.

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VOLUME THREE

RAILROAD CASH FLOW MODEL PROGRAMMER'S MANUAL

3.1 Introduction

This manual provides information on how to service the cash flow model. It is written for a user who has some familiarity with standard IBM FORTRAN-IV and the WYLBUR system. The model was designed to perform a specific cash flow analysis for specific railroads. It is sufficiently general, however, so that it may be updated and its data modified, or so that the model may be applied to other industries.

The manual has four sections. The first section discusses the model design through its technical specifications, data requirements and algorithms. The second section defines the data base specifications and defines the data names. The third section is an annotated listing of the program. The fourth section describes verification and test procedures for the model.

3.2 Model Design

This section has three parts: technical specifications, data requirements and algorithms.

3.2.1 Technical Specifications

The cash flow model is resident in the EPA's Washington Computer Center (WCC). It is called CASHFLOW, but it must be accessed by typing:

USE $CN.EPAJHV.S2KC.CASHFLOW

in order to bring it into the user's workspace from the EPAJHV.S2KC area.

The program is written in standard IBM FORTRAN-IV and has approximately 340 lines.

Job control language to run the program and make the output available for retrieval from a remote terminal is stored in a program called RUNCASH which is stored on Volume USER63 of the area EPAJHV.S2KC. To run CASHFLOW, one must bring RUNCASH into one's workspace, and then instruct the computer to run RUNCASH. This is done by typing USE $CN. EPAJHV.S2KC.RUNCASH and then RUN NOTIFY.

The author of CASHFLOW is Energy Resources Co. Inc., Cambridge, Massachusetts.

3.2.2 Data Requirements

3.2.2.1 Summary of Data Requirements

Six data files are accessed when the cash flow model is run. The use of multiple data files allows easy access to individual datums and facilitates updating the data. The format of each data file is described below. Table 3-1 summarizes the necessary data files, their computer names and their contents.

Examples of all data files are available in Appendix A.

TABLE 3-1

DATA FILE SUMMARY

NAME	CONTENTS
CN.EPALYG.S2KC.YDINV	Firm-by-firm yard inventory
CN.EPALYG.S2KC.GNPDEF	Gross national product deflators, 1973-1980
CN.EPAJHV.S2KC.PVCST1	Yearly investment and depreciation charges, by yard type
CN.EPALYG.S2KC.CAST8ONE	Net income forecasts - baseline and after regulation
CN.EPAJHV.S2KC.MISC	Key financial parameters
CN.EPAJHV.S2KC.BASE	Historical financial data

3.2.2.2 Yard Inventory

A railroad-by-railroad yard inventory is needed. This yard inventory is given the computer name $CN.EPALYG.S2KC.YDINV and is resident on WYLBUR. The inventory is set up in a matrix where the rows are firms and the columns are yard types. Column 2 is Hump Yards, 3 is Flat Classification, 4 is Flat Industrial, and 5 is Small Industrial. Column 1 is the firm number.

3.2.2.3 Gross National Product Deflators

Deflators are needed to correct historical financial data to 1980 dollars. These deflators are stored in one column in F5.1 format. The first row is the deflator for 1973, the second for 1974, etc., and the eighth row is the deflator for 1980.

The computer name for the deflator file is:

$CN.EPALYG.S2KC.GNPDEF

3.2.2.4 Cost Files

Eight files, called PVCSTX, where X is the scenario name, contain depreciation and investment cost by year by yard type for each scenario. Because only one scenario is modeled at a time, only one cost file is accessed at a time.

The first row of these cost files is yearly depreciation, assuming no inflation, by yard type. The next 31 rows are yearly investment by yard type in 1980 dollars. The next 31 rows are yearly depreciation in nominal dollars by year, assuming 8 percent inflation and beginning in 1980. These were created by another model. The depreciation algorithm is defined in the model description. The columns in these files are yard types, where one is hump, two is flat classification, three is flat industrial and four is small industrial. The format of these files is 4(F10.6,1X).

The names of these files are:

CN.EPALYG.S2KC.PVCSTX

where X is a scenario number from 1 to 8.

3.2.2.5 <u>Net Income Forecasts</u>

Net income forecasts, by firm, are contained in files called:

CN.EPALYG.S2KC.CASTXXX

where XXX is the first three letters of the scenario number (ONE,TWO,THR,...,EIG).

The first line of each file contains the year of the forecast. The next 40 lines contain firm-by-firm net income forecasts, before and after regulation, in millions. Following is another year indicator and then 40 lines (for 40 firms). These data files contain forecasts for 1980, 1985, 1990, 2000 and 2010. The correspondence of firm to firm number is given in Appendix B.

3.2.2.6 Key Financial Parameters

Financial parameters, including the project time horizon, the corporate tax rate, the discount rate, the inflation rate, the construction year, investment tax credit rate, and the number of firms, are included in a file called

CN.EPAJHV.S2KC.MISC

Each line is a different parameter. The parameters, in order, and their respective format codes are shown in Table 3-2.

3.2.2.7 Historical Financial Data

The file identified as:

$CN.EPAJHV.S2KC.BASE

contains basic historical financial data on a firm-by-firm basis. Column 1 is net income, colume 2 is equity in undistributed earnings of affiliates, column 3 is net worth and column 4 is deferred taxes. The lines are on a firm-by-year basis, where line 1 contains 1973 data for firm 1, line 2 contains 1974 data for firm 1, and line 6 contains 1978 data for firm 1. Line 7 contains 1973 financial data for firm 2.

Six-line (1973-1978) sets of financial data exist for each firm. There are 40 firms and so there are 240 lines of financial data in $CN.EPAJHV.S2KC.BASE. The format of each line is 2(F10.3,F9.3).

TABLE 3-2

KEY FINANCIAL PARAMETERS: FILE EPAJHV.S2KC.MISC

DATA ITEM	FORMAT CODE
Number of Firms	I2
Corporate Tax Rate	F3.2
Investment Tax Credit	F3.2
Discount Rate	F3.2
Inflation Rate	F3.2
Construction Year	I4
Project Time Horizon	I2

3.2.3 Algorithms

This section describes how the program determines its results. First, a general description of how the model operates and a detailed flow diagram are presented. Next, key algorithms are presented. These are cross-referenced to the approximate location in the program where they appear.

3.2.3.1 Model Operation

The cash flow model operates by reading from several data files as described in Section 3.2.2, performing various calculations on the data and then printing a detailed report which includes all the results. A more specific model description was provided in Section One of the software documentation, the model description.

A detailed flow diagram of the model is shown in Figure 1. There are no complex loops in the model. Instead, the data are input and processed, and the results are printed.

The main result of the model, the ratio of Net Present Value of Future Cash Flows (DCF) to Net Worth (NW) for each firm, is determined through a series of equations which may be summarized in the following expression:

$$NPV/NW = (DCF - PVINV + PVDEP - PVOM - NW)/NW$$

where:

- NPV is the net present value of future cash flows

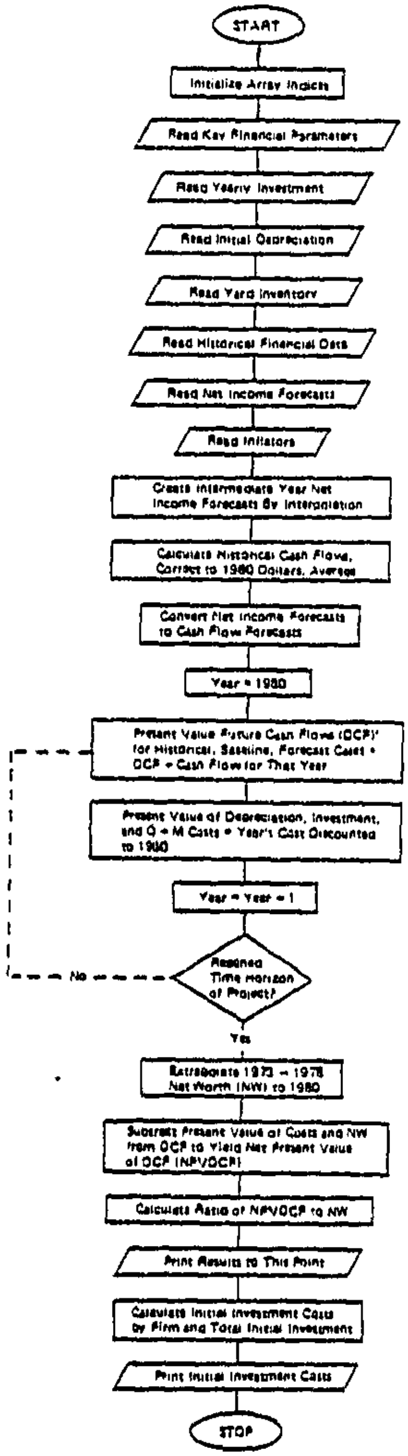

Figure 1. Flow Diagram of Railroad Cashflow Model.

- DCF is the present value of future cash flows
- PVINV is the present value of investment in noise abatement equipment
- PVDEP is the present value of tax advantages accruing because of depreciation on the equipment
- PVOM is the present value of operating and maintenance expenses
- NW is the net worth of the firm

<u>NPV</u> is the net present value of future cash flows, calculated as the difference between the present value of the firm's future cash flows and the sum of the present value of the firm's net expenditures on abatement equipment and maintenance costs (after taxes) and the firm's net worth.

<u>DCF</u> is the present value of the firm's cash flows over the time horizon of the project. Cash flow is defined in two ways.

In the <u>historical cash flow</u> approach, the firm's cash flow was assumed constant over time. Cash flow was based on 1973 to 1978 average cash flow (corrected to 1980 dollars) where cash flow was defined as follows:

$$CF = NI + DEFT + EQ$$

where:

- CF is cash flow
- NI is net income
- DEFT is deferred taxes
- EQ is equity in earnings of affiliates.

Depreciation was not added back into historical cash flow because it was assumed depreciation would be used to replace existing capital. The historical cash flow approach is the same as the one used in earlier railroad noise regulation background documents.

Because the baseline and derived forecasts provide only net income forecasts and not forecasts for the other accounts in cash flow, the forecasted cash flow method is used to convert net income to cash flows. For the two forecasted data sets, baseline and derived forecast, net income is converted to cash flows as follows:

$$CF = NI \cdot \frac{AVGCF_{73-78}}{AVGNI_{73-78}}$$

where:

- CF is cash flow
- NI is firm net income from the forecast
- $AVGCF_{73-78}$ is average cash flow over the 1973 to 1978 period
- $AVGNI_{73-78}$ is average net income over the 1973 to 1978 period

This algorithm appears near line 170 of CASHFLOW.

CF (cash flow) is derived by multiplying NI (net income) by the average ratio of cash flow to net income over the historical period. Since the components of cash flow other than NI are not available, multiplying NI by the ratio of CF to NI was chosen as an appropriate method of converting NI to CF.

Net income forecasts were provided by another model for the years 1980, 1985, 1990, 2000 and 2010. Forecasts for years between the forecasted years are internally generated using linear interpolation. The general formula for this linear interpolation is:

$$NI_{T2} = \frac{NI_{T3} - NI_{T1}}{T3 - T1} \times (T2 - T1) + NI_{T1}$$

where:

- NI is net income
- T3 is the later forecast year provided in the data set (e.g., 1990)
- T2 is the year of the net income forecast to be created by linear interpolation
- T1 is the earlier forecast year provided on the data set (e.g., 1985).
- NI_T means net income in period T

This linear interpolation takes place near line 135.

Present value of the firm's future cash flows was determined according to the formula

$$DCF = \sum_{t=0}^{LIFE-1} \frac{(CF_t)(1+INFLATION)^t}{(1+DISCOUNT)^t}$$

where:

- DCF is the present value of future cash flows
- LIFE is the time horizon of the project
- INFLATION is the assumed rate of inflation
- DISCOUNT is the opportunity cost of capital to the railroad
- CF_t is the cash flow in period t. In the historical case, CF_t was equal to the 1973-1978 average cash flow expressed in 1980 dollars. In the baseline forecast, CF_t is equal to the firm projected cash flow for that year. In the post-regulatory derived forecast, CF_t is the post-compliance cash flow for that year derived from the projections of net income yielded by the profit-maximization model and the baseline forecast. Under the scenario of no regulation, the baseline forecast cash flow will equal cash flows calculated using the profit-maximization derived forecast

This algórithm appears near line 170.

PVINV is the present value of investment on abatement equipment, defined as:

$$PVINV = \sum_{t=0}^{LIFE} \sum_{j=1}^{i} \frac{COST_j(1+INFLATION)^t(1-ITC)}{(1+DISCOUNT)^t}$$

where:

- $COST_j$ is the cost of abatement item j
- ITC is the federal investment tax credit, assumed to be taken in the year the investment is made

Calculated near line 182.

PVDEP is the present value of depreciation, assumed to be straight-line. Because depreciation is not a cash outflow, but is tax deductible, it adds to the cash flow of the firm. Thus, the tax savings accruing because of depreciation on abatement equipment were added back to the present value of the firm's cash flow according to the formula:

$$PVDEP = \sum_{t=TIME}^{LIFE-1} \sum_{j=1}^{i} \frac{C_j \quad (TAX)}{T_j \; (1+DISCOUNT)^T}$$

where:

- PVDEP is the present value of depreciation expenses
- T_j is the service life of item j
- C_j is the cost of each of i items of abatement equipment. C_j is assumed to be the cost of each item in the year it is purchased until the year the item is scheduled to wear out. Service lives vary between 10 years for local sound barriers for idling locomotives to an infinite period for land purchases. After the service life is over, C_j is multiplied by one plus the inflation rate raised to the power of the service life. At the end of the replacement item's service life, the cost of the replacement item is inflated as above to obtain the newest item's cost. This process is repeated as often as necessary. For example, assuming a 25-year time horizon, an item with a 10-year service life must be purchased three times -- at the beginning of the project, in the 11th year of the project and in the 21st year of the project. If the project begins in 1980, the item's cost will be in 1980 dollars for 1980-1989, 1990 dollars for 1990-1999, and 2000 dollars for 2000-2004. This inflation of each item's cost at the end of its service life reflects the fact that depreciation is calculated as a proportion of purchase cost, not replacement cost.
- TIME is the number of years after 1980 investments are made (TIME = Investment year - 1980).

Determined near line 180.

PVOM is the present value of operating and maintenance expenses of the abatement equipment. These expenses were assumed to be zero in this model, which was done near line 186.

NW is the net worth of the firm, also known as the stockholders' equity or net investment. The net worth used was a straight-line extrapolation of 1973-1978 growth in net worth to 1980, made according to the formula:

$$NW_{1980} = [(NW_{1978} - NW_{1973})/5] \times 2 + NW_{1978}$$

where:

- NW_{1980} is 1980 net worth
- NW_{1978} is 1978 net worth
- NW_{1973} is 1973 net worth
- $(NW_{1978} - NW_{1973})/5$ represents the average growth in net worth over the 1973-1978 period

Net worth is calculated near line 195.

Initial Investment Costs

The model also calculates initial investment costs for each firm by multiplying the compliance cost per yard type by the number of each yard type owned by each firm. The formula is as follows:

$$\text{Investment}_{\text{Firm}} = \sum_{\text{Yard}=1}^{4} \text{Cost}_{\text{Yard}} \cdot \text{Number}_{\text{Yard}}$$

where:

- $\text{Investment}_{\text{Firm}}$ is the initial investment by firms

- $Cost_{yard}$ is the initial investment cost by yard type: hump, flat classification, flat industrial, and small industrial
- $Number_{yard}$ is the number of each yard type owned by the railroad

This is determined near line 180.

3.3 Data Definitions

3.3.1 Introduction

This model processes much information using relatively few data names. There are essentially four types of data names used in the program. These are arrays, array indices, constants and variables. Arrays are matrices of one or two dimensions which store large blocks of similar data. Array indices tell what type of data is stored in a row or a column of an array. Constants are numerical constants which have been given alphabetic names to make the program more clear. Variables are numerical scratch pads whose value changes during computations.

This section has three more parts. Section 3.3.2 defines the arrays and array indices. Section 3.3.3 defines the constants. Section 3.3.4 defines the variables.

3.3.2 Arrays and Array Indices

Definitions of arrays and array indices are most easily conveyed in tabular form. Table 3-3 lists the arrays and describes their purpose.

Array markers are shown in Table 3-4. The array marker name, the array it corresponds to, its function and its value are all shown in this table.

TABLE 3-3

ARRAY DEFINITIONS

ARRAY	DEFINITION
YDCST	Yearly investment in 1980 dollars by yard type, beginning in first year of compliance
YDDEP	Yearly depreciation by yard type, in nominal dollars, beginning in 1980
BASE	Basic historical financial data 1973-1978 by firm
IYEAR	Tells which year individual net income forecasts correspond to
YDINV	Firm-by-firm yard inventory by yard type (Hump, Flat Classification, Flat Industrial)
HISRAT	Ratio of net present value of future cash flows to firm net worth, historical basis
BASRAT	Ratio of net present value of future cash flows to firm net worth, baseline forecast basis
FORRAT	Ratio of net present value of future cash flows to net worth, post-compliance forecast
PVINV	Present value of investment costs, by firm
PVDEP	Present value of depreciation, by firm

TABLE 3-3 (cont.)

ARRAY	DEFINITION
PVCF	Present value of cash flows. Rows: firms. Columns: historical basis, baseline forecast basis, post-compliance forecast basis
PVOM	Present value of operating and maintenance expenses
FRCST	First-year investment cost by firm
PVNW	1973-1978 net worth extrapolated to 1980, linearly
GNPDEF	Gross National Product Deflators 1973-1978
INCOME	Post-compliance net income forecast, 1980-2010, by firm, by year
BASINC	Baseline forecast net income forecast 1980-2010, by firm, by year
ANSWER	Columns: Net present value of future cash flows, historical basis before and after compliance, baseline forecast before and after compliance, post-compliance forecast after compliance. Rows: Firms

TABLE 3-4

ARRAY MARKERS

ARRAY MARKER NAME	ARRAY IT MARKS	VALUE	COLUMN FUNCTION
NW	Base	1	Net worth
DEFT	Base	2	Deferred taxes
NI	Base	3	Net income
EQ	Base	4	Equity in earnings of affliates
AVGCF	Base	5	Average cash flow 1973-1978
AVGNI	Base	6	Average net income 1973-1978
B73	Several	1	Year 1973
B74	"	2	Year 1974
B75	"	3	Year 1975
B76	"	4	Year 1976
B77	"	5	Year 1977
B78	"	6	Year 1978
B79	"	7	Year 1979
B80	"	8	Year 1980
HISTNO	Answer	1	Historical basis: no compliance
HISTO	"	2	Historical basis: post-compliance
BASENO	"	3	Baseline forecast: no compliance
BASEO	"	4	Baseline forecast: post-compliance
FORCSO	"	5	Post-compliance forecast

TABLE 3-4 (cont.)

ARRAY MARKER NAME	ARRAY IT MARKS	VALUE	COLUMN FUNCTION
HUMP	Several	1	Yard type: Hump
FLTCLS	"	2	Yard type:Flat Classification
FLTIND	"	3	Yard Type: Flat Industrial
SMLIND	"	4	Yard type: Small Industrial

3.3.3 Constants

Constants maintain the same value throughout the program and are usually key parameters that one wants the ability to easily change. Table 3-5 defines the constants used in this program.

TABLE 3-5

DEFINITION OF CONSTANTS

NAME	FUNCTION
FIRMS	Number of railroad firms analyzed
TAX	Corporate tax rate
ITC	Investment tax credit
DISCNT	Discount rate
INFLAT	Inflation rate
TIME	Year initial costs are incurred
NUTIME	Converts year initial costs are incurred to a counter which is used in the addition of investment costs. Equal to TIME-1979.
JKADJ	An exponent used to inflate investment costs. Equal to NUTIME + 1.
NUMBER	Number of sets of net income forecasts to be read in; should never be changed unless new sets of forecasts are made

3.3.4 Variables

Variables change value throughout the program. Table 3-6 lists the variables used and their function.

TABLE 3-6

DEFINITION OF VARIABLES

NAME	FUNCTION
PAGE	Stores number of pages to print page number as heading
COUNT	Counts lines to determine when a page should be ejected
DIFYER	Number of years between individual net income forecasts
FN	Dummy variable
XDUM1	Dummy variable
LOWYER	Lower year in set of net income forecasts to be used to interpolate other net income forecasts[a]
HIYEAR	Higher year in set of net income forecasts to be used to interpolate other net income forecasts[a]
INDYER	First year of net income forecast in set internally generated by interpolation
IHIYER	Last year of net income forecast set internally generated by interpolation
INCSML	Value of post-compliance net income forecast in INDYER (lower year)
INCBIG	Value of post-compliance net income forecast in IHIYER (higher year)
BASSML	Value of baseline forecast net income in INDYER (lower year)

TABLE 3-6 (cont.)

NAME	FUNCTION
INCGRO	Linear growth rate of post-compliance forecast net income between INDYER and IHIYER
BASGRO	Linear growth rate of baseline forecast net income between INDYER and IHIYER
CHANGE	Change in net present value of future cash flow before and after regulation, historical basis
CHNG1	Change in net present value of future cash flows before and after regulation, derived forecast basis
IYEARD	Converts numerical year value to an array index 1980=1,1981=2, . . .
INUMB	Counts number of sets of net income interpolations to be made
IDUM	Dummy variable
XNWGRO	Linear growth in firm net income, 1973-1978
TOTCST	Total first year investment costs, all firms
IFIRM	Firm number; used in DO-LOOP
IYEAR	Year; used in DO-LOOP

[a]Net income forecasts for the years 1980, 1985, 1990, 2000 and 2010 are generated by another model and are available in the data files. Forecasts not in the data file are automatically internally generated by linear interpolation. LOWYER, HIYEAR, INDYER, IHIYER, INCSML, INCBIG, BASSML, INCGRO and BASGRO are all used to generate net income forecasts.

3.4 Annotated Listing of the Program

A fully commented listing of CASHFLOW is presented below.

```
C CASHFLOW
C RAILROAD CASH FLOW MODEL
C CALCULATES NET PRESENT VALUE OF FUTURE CASH FLOWS
C FOR RAILROAD FIRMS AND OTHER  DATA, SUCH AS
C INITIAL INVESTMENT COSTS
C AUTHOR: STEWART KAGAN, ENERGY RESOURCES COMPANY
C PROGRAM REQUIRES DATA FROM SEVERAL INPUT FILES
C THIS DATA INCLUDES A YARD INVENTORY FOR EACH FIRM
C HISTORIACL FINANCIAL DATA ON EACH FIRM, PROJECTIONS
C OF NET INCOME FOR EACH FIRM OVER AN INDETERMINATE
C TIME HORIZON, INVESTMENT COSTS BY YARD TYPE
C THE GNP DEFLATOR FOR 1973-1980
C TO CORRECT ALL NOMINAL DOLLAR FIGURES TO 1980 DOLLARS
C AND A FILE CONTAINING KEY PARAMETERS SUCH
C AS TAX RATES,  DISCOUNT RATE, INFLATION RATE, NUMBER OF FIRMS
C TIMING OF INVESTMENT, TIME HORIZON OF STUDY
C       DECLARE ARRAYS
C BASE FINANCIAL DATA. INCLUDES: FIRM NET INCOME, EARNINGS FROM
C  EQUITY IN AFFILIATES, NET WORTH, DEFERRED TAXES, AVERAGE
C  CASH FLOW, AVERAGE NET INCOME  (1973-78)
        REAL BASE (60,7,8)
        INTEGER NW,DEFT,NI,EQ,AVGCF,AVGNI,B79, B80
        INTEGER HISTNO,HISTO,BASENO,BASEO,FORCSO,FIRMS,LIFE,TIME
        INTEGER PAGE,COUNT
C VARIABLES NEEDED TO FORECAST NET INCOME
        INTEGER IYEAR(15)
        INTEGER DIFYER,FN,LOWYER,HIYEAR,NUMBER,INDYER,IHIYER
          REAL INCSML,INCBIG,BASBIG,BASSML,INCGRO,BASGRO
C 50 FIRMS, 5 YARD TYPES-YDINV IS YARD INVENTORY
           INTEGER YDINV(50,5)
C YARD TYPES- INDICES FOR ARRAYS
         INTEGER HUMP,FLTCLS,FLTIND,SMLIND
         INTEGER ICOUNT
C THESE ARE YEARS- MARKERS FOR ARRAYS SUCH AS THE STORAGE AREA FOR
C  HISTORICAL DATA
        INTEGER B73,B74,B75,B76,B77,B78
C BELOW ARE THE THREE ARRAYS FOR STORAGE OF  THE RATIOS
C OF NET PRESENT VALUE OF FUTURE CASH FLOWS TO NET WORTH
```

```
              REAL HISRAT(50),FORRAT(50),BASRAT(50)
C  AREA FOR INTERMEDIATE RESULTS
          REAL PVINV(70),PVDEP(70),PVCF(70,3),PVOM(70)
C  ABOVE IS PRESENT VALUE OF INVESTMENT STREAM, DEPRECIATION STREAM,
C  AND CASH FLOW STREAM.
C COSTS TO INDIVIDUAL  FIRMS  OF INITIAL INVESTMENT
               REAL FRCST(70)
          INTEGER HIST,BASELI,FORCST
C CHANGES IN NET CASH FLOWS, DISCOUNT RATE, INFLATION RATE
C  RATE, TAX RATE, ITC
          REAL CHANGE,CHNG1,DISCNT,INFLAT,TAX,ITC
C  PRESENT VALUE OF NET WORTH AT END OF LIFE
          REAL PVNW(70)
C  INFLATION RATE 1973-80
          REAL GNPDEF(8)
C  NET INCOME BY YEAR BY FIRM (FORECAST)
          REAL INCOME (60,60)
C  BASELINE NET INCOME, BY FIRM, BY YEAR
          REAL BASINC (60,60)
C  ARRAY TO STORE ANSWERS BY FIRM; HISTORICAL WITH OPTION, W/O OPTION
C  BASE WITH & W/O OPTION, FORECAST WITH OPTION
          REAL ANSWER(70,5)
C PRESENT VALUE OF COST AND DEPRECIATION BY YARD
              REAL YDCST(40,6),YDDEP(40,6)
C PRESENT VALUE OF INVESTMENT COST BY YARD
           REAL INIINV(6)
          DATA HISTNO/1/, HISTO/2/, BASENO/3/, BASEO/4/, FORCSO/5/
          DATA HIST/1/,BASELI/2/,FORCST/3/
          DATA B73/1/,B74/2/,B75/3/,B76/4/,B77/5/,B78/6/,B79/7/,B80/8/
          DATA NW/3/,NI/1/,EQ/2/,DEFT/4/,AVGCF/5/,AVGNI/6/
           DATA HUMP/1/,FLTCLS/2/,FLTIND/3/,SMLIND/4/
C  FIRST READ IN # OF FIRMS, DEPRECIATION METHOD, TAX RATE, ITC, DISCO
UNT
C RATE, INFLATION RATE ,TIMING OF INVESTMENTS, TIME HORIZON
          READ (21,10)   FIRMS
10                 FORMAT(I2)
          READ (21,30)   TAX
   30 FORMAT(F3.2)
          READ (21,40)   ITC
   40 FORMAT(F3.2)
          READ (21,50)   DISCNT
```

```
    50 FORMAT(F3.2)
         READ (21,60)  INFLAT
    60 FORMAT(F3.2)
         READ (21,75)  TIME
    75 FORMAT(I4)
           READ(21,10) LIFE
             READ (3,85) XDUM1,XDUM2,XDUM3,XDUM4
C INITIAL INVESTMENT BY YARD TYPE
         DO 80 IYR=1,31
C YEARLY INVESTMENT BY YARD TYPE
80         READ (3,85) (YDCST(IYR,IYARD),IYARD=HUMP,SMLIND)
             DO 83 IYR=1,31
C YEARLY DEPRECIATION BY YARD TYPE
83           READ(3,85) (YDDEP(IYR,IYARD),IYARD=HUMP,SMLIND)
85            FORMAT (4(F10.3,1X))
C YARD INVENTORY
             DO 89 IFIRM=1,FIRMS
89           READ(1,8900) IDUM,(YDINV(IFIRM,IYARD),IYARD=HUMP,SMLIND)
8900       FORMAT(2X,I2,4(2X,I3))
C  NOW READ IN BASE FINANCIAL DATA: (1973-1978) DATA
        DO 95 I=1,FIRMS
        DO 95 J=1,B78
95       READ (22,100) BASE(I,J,NI),BASE(I,J,EQ),BASE(I,J,NW),
      CBASE(I,J,DEFT)
   100 FORMAT (F10.3,F9.3,F10.3,F9.3)
C  COMPLIANCE COSTS
C  NET INCOME FORECAST FOR THIS SCENARIO
C  NUMBER TELLS HOW MANY YEARS OF INCOME FORECASTS TO READ IN
          NUMBER=5
         DO 118 I=1,NUMBER
C IYEAR: YEAR OF INCOME FORECAST; FN: DUMMY VARIABLE
          READ (24,115)  IYEAR(I),FN
115      FORMAT (I4,2X,I2)
C THE NET INCOME FORECASTS ALWAYS CONTAIN FORECASTS FOR FORTY FIRMS
C THEREFORE, EVEN IF WE ARE LOOKING AT ONLY TWO FIRMS, WE MUST
C READ IN DATA FOR  40 FIRMS. THEREFORE , SET ARRAY INDEX BELOW
C TO 40, NOT THE NUMBER OF FIRMS
         DO 118 J=1,40
C IYEARD:  ADJUSTS  YEAR OF FORECAST TO AN ARRAY INDEX
```

```
C FOR EXAMPLE,  1980 BECOMES 1, THE FIRST ENTRY IN THE ARRAY
             IYEARD=IYEAR(I)-1979
118       READ (24,130) BASINC(J,IYEARD),INCOME(J,IYEARD)
130        FORMAT(2(F10.5,2X))
C  INFLATION RATE  1973-78
         DO 142 I=1,880
142      READ (2,145) GNPDEF(I)
145      FORMAT (1F5.1)
C  CALCULATIONS BEGIN HERE
C  IN THIS SECTION INDIVIDUAL NET INCOME FORECASTS
C  ARE GENERATED UNDER THE BASELINE AND MODIFIED BASELINE
C  FORECASTS
           INUMB=NUMBER-1
        DO 210 I=1,INUMB
         LOWYER=IYEAR(I)-1979
        HIYEAR=IYEAR((I+1))-1979
C INDYER IS THE INDEX YEAR
         INDYER=LOWYER+1
C     IHIYER IS THE OBJECT YEAR
         IHIYER=HIYEAR-1
        DO 210 J=1,FIRMS
C  FIRST CALCULATE CASH FLOW AVERAGE (1973-78)
C  CORRECT FOR INFLATION, AVERAGE, THEN UPDATE TO 1980
C CALCULATE INDIVIDUAL BASELINE YEARS BY INTERPOLATION
           BASSML=BASINC(J,LOWYER)
          INCSML=INCOME(J,LOWYER)
          BASBIG=BASINC(J,HIYEAR)
          INCBIG=INCOME(J,HIYEAR)
          BASGRO=(BASBIG-BASSML)/(HIYEAR-LOWYER)
          INCGRO=(INCBIG-INCSML)/(HIYEAR-LOWYER)
```

```
                  ICOUNT=1
               DO 210 II=INDYER,IHIYER
                  INCOME(J,II)=INCSML+ICOUNT*INCGRO
                  BASINC(J,II)=BASSML+(ICOUNT*BASGRO)
      210              ICOUNT=ICOUNT+1
               DO 250 I=1,FIRMS
      C  AVERAGE OVER SIX YEARS
                BASE(I,B73,AVGCF)=0
                BASE(I,B73,AVGNI)=0
                DO 250 J=1,B78
                BASE(I,B73,AVGCF)=BASE(I,B73,AVGCF)+(BASE(I,J,NI)+BASE(I,J,
             CDEFT)-BASE(I,J,ED))*(GNPDEF(B80)/GNPDEF(J))/B78
      250        BASE(I,B73,AVGNI)=BASE(I,B73,AVGNI)+BASE(I,J,NI)*GNPDEF(B80)
             CGNPDEF(J)/B78
      C  FIND CASH FLOW OF BASELINE AND FORECAST NET INCOME
                DO 400 I=1,FIRMS
                PVCF(I,BASELI)=0
                PVCF(I,HIST)=0
                PVCF(I,FORCST)=0
      C  PRESENT VALUE OF FUTURE CASH FLOWS
                DO 280 J=1.LIFE
                  IF((BASE(I,B73,AVGNI)).NE.0.0) GO TO  260
                PVCF(I,BASELI)=PVCF(I,BASELI)+BASINC(I,J)
            C*(((1.+INFLAT)**(J-1))/((1.+DISCNT)**(J-1)))
                  PVCF(I,FORCST)=PVCF(I,FORCST)+INCOME(I,J)
            C*(((1.+INFLAT)**(J-1))/((1.+DISCNT)**(J-1)))
                  GO TO 280
      260       PVCF(I,BASELI)=PVCF(I,BASELI)+BASINC(I,J)
            C*(BASE(I,B73,AVGCF)/BASE(I,B73,AVGNI))
            C*(((1.+INFLAT)**(J-1))/((1.+DISCNT)**(J-1)))
                 PVCF(I,FORCST)=PVCF(I,FORCST)+INCOME(I,J)*(((1.+INFLAT)
            C**(J-1))/((1.+DISCNT)**(J-1)))*BASE(I,B73,AVGCF)/BASE(I,B73,AVG
I
            C)
      280       PVCF(I,HIST)=BASE(I,B73,AVGCF)*((1.+INFLAT)**(J-1))/((1.+DISC
            CNT)**(J-1))+PVCF(I,HIST)
      C INITIAL INVESTMENT COSTS BY FIRM
      C CALCULATED BY MULTIPLYING FIRM YARD INVENTORY
      C BY INITIAL INVESTMENT COST PER YARD TYPE
                 DO 299 IYARD=HUMP,SMLIND
                    FRCST(I)=YDINV(I,IYARD)*YDCST(1,IYARD) + FRCST(I)
```

```
299          CONTINUE
C PRESENT VALUE OF INVESTMENT,DEPRECIATION AND OPERATING COSTS
C NUTIME: NUMBER OF YEARS 1FTER 1979 INVESTMENTS ARE MADE
        NUTIME=TIME-1979
        DO 300 JK=NUTIME,LIFE
C JKADJ: NUMBER OF YEARS AFTER 1980 INVESTMENTS ARE MADE
C JKADJ IS USED AS AN EXPONENT TO INFLATE AND DISCOUNT VALUES
C OVER TIME
       JKADJ=JK-NUTIME+1
          DO 300  IYARD=HUMP,SMLIND
C PRESENT VALUE OF INVESTMENTS OVER TIME
C INVESTMENT COSTS ARE DISCOUNTED, ITC ISD NETTED OUT
         PVINV(I)=PVINV(I)+YDINV(I,IYARD)*YDCST(JKADJ,IYARD)*
     C(1.-ITC)
     C*(((1.+INFLAT)**(JK-1)))/((1.+DISCNT)**(JK-1))
C DEPRECIATION IS STRAIGHT-LINE AND IS INPUT
C PRESENT VALUE OF TAX SAVINGS ACCRUING BECAUSE OF DEPRECIATION
         PVDEP(I)=PVDEP(I)+YDINV(I,IYARD)*YDDEP(JKADJ,IYARD)*TAX
     C*((1.+INFLAT)**(NUTIME-1))/((1.+DISCNT)**(JK-1))
          PVOM(I)=0.0
300      CONTINUE
  400 CONTINUE
C  NOW CREATE OUTPUT ARRAY
         DO 500 I=1,FIRMS
C EXTRAPOLATE 1973-1978 CHANGES IN NET WORTH TO 1980
C BY STRAIGHT-LINE INTERPOLATION
        XNWGRO=(BASE(I,B78,NW)-BASE(I,B73,NW))/(B78-B73)
           BASE(I,B80,NW)=BASE(I,B78,NW)+XNWGRO*(B80-B78)
        ANSWER(I,HISTNO)=PVCF(I,HIST)-BASE(I,B80,NW)
        ANSWER(I,HISTO)=ANSWER(I,HISTNO)-PVINV(I)+PVDEP(I)-PVOM(I)
        ANSWER(I,BASENO)=PVCF(I,BASELI)-BASE(I,B80,NW)
        ANSWER(I,BASEO)=  ANSWER(I,BASENO)-PVINV(I)+PVDEP(I)-PVOM(I)
500     ANSWER(I,FORCSO)=PVCF(I,FORCST)-PVINV(I)+PVDEP(I)-PVOM(I)-BAS
     C(I,B80,NW)
C       OUTPUT SECTION
C      INTERMEDIATE RESULTS
          WRITE(6,505 )
 505       FORMAT('0', 'NUMBER OF FIRMS', 5X,'TIME HORIZON OF PROJECT
     C,5X,'IMPLEMENTATION YEAR')
       WRITE (6,510)  FIRMS, LIFE,TIME
```

```
 510     FORMAT('B',7X,I2,25X,I2,25X,I4)
         WRITE (6,515 ) TAX,ITC,DISCNT,INFLAT
 515        FORMAT('0','TAX RATE:',1X,F6.3,3X,'ITC:',1X,
        CF6.3,5X,'DISCOUNT RATE:',1X,F6.3,3X,
        C'INFLATION RATE:',1X,F6.3)
          WRITE (6,520 )
 520      FORMAT('1',50X,'INTERMEDIATE RESULTS')
         WRITE (6,575)
         WRITE (6,525 )
 525      FORMAT('0',4X,'FIRM',5X,'PRESENT VALUE',4X,'PRESENT VALUE'
        C,6X,'PRESENT VALUE',18X,'PRESENT VALUE OF CASH FLOW')
          WRITE (6,530 )
 530      FORMAT('B',13X,'OF INVESTMENT',4X,'OF OPERATING',
        C7X,'OF DEPRECIATION')
         WRITE (6,535 )
 535       FORMAT('B',15X,'COST',11X,'MAINTENANCE',36X,'HISTORICAL'
        C,5X,'BASELINE',7X,'FORECAST')
         WRITE (6,540 )
 540        FORMAT('B',13X,13('*'),4X,15('*'),4X;15('*'),
        C13X,10('*'),5X,8('*'),7X,8('*'))
        DO 550 I=1,FIRMS
 550     WRITE(6,560) I,PVINV(I),PVOM(I),PVDEP(I),PVCF(I,HIST)
        C,PVCF(I,BASELI),PVCF(I,FORCST)
 560     FORMAT('0',4X,I2,4X,F12.3,6X,F12.3,7X,F12.3,13X,
        CF12.3,4X,F12.3,2X,F12.3)
        WRITE (6,565)
 565        FORMAT('1',3X,'1978 NET WORTH EXTRAPOLATED TO 1980 '
        C,'LOGARITHMICALLY')
        WRITE (6,570)
 570      FORMAT('0',5X,'FIRM',11X,'NET WORTH')
           WRITE (6,573)
 573     FORMAT('B',21X,'(MILLIONS)')
         WRITE (6,575)
 575     FORMAT('0')
        DO 580 I=1,FIRMS
 580    WRITE (6,585) I,BASE(I,B80,NW)
 585     FORMAT('B',6X,I2,11X,F12.3)
         PAGE=0
         COUNT=1
         DO 800 I=1,FIRMS
```

```
                IF(I.EQ.1) GO TO 590
                IF (COUNT.LE.51) GO TO 645
      590          COUNT=7
                 WRITE (6,600)
      600        FORMAT('1')
                PAGE=PAGE+1
                 WRITE (6, 610)  PAGE
      610       FORMAT ('0',42X,'NET PRESENT VALUE OF FUTURE CASH FLOW ANALYS
S'
             C,34X,'PAGE',1X,I2)
                WRITE (6,620)
      620       FORMAT('B',42X,44('*'))
                WRITE (6,630)
      630       FORMAT('0',10X,'FIRM NAME',32X,'HISTORICAL AVERAGE',
             C8X,'BASELINE FORECAST',8X,'COMPLIANCE FORECAST')
                WRITE (6,640)
      640       FORMAT ('B',53X,'(MILLIONS)',16X,'(MILLIONS)',16X,'(MILLIONS
             C')
      645       A1=ANSWER(I,HISTNO)
                A2=ANSWER(I,BASENO)
                A3=ANSWER(I,HISTO)
                A4=ANSWER(I,BASEO)
                A5=ANSWER(I,FORCSO)
                  WRITE (6,650) I,A1,A2
      650       FORMAT('0',13X,I2,16X,'NPV OF FUTURE',9X,F10.3,16X,
             CF10.3, 16X,'NOT APPLICABLE')
                WRITE (6,660)
      660       FORMAT('B',31X,'CASH FLOW- NO')
                WRITE (6,670)
      670       FORMAT ('B',31X,'COMPLIANCE')
                WRITE (6,680) I,A3,A4,A5
      680       FORMAT('0',13X,I2,16X,'NPV OF FUTURE',9X,F10.3,16X,
             CF10.3,16X,F10.3)
                WRITE (6,690)
      690       FORMAT('B',31X,'CASH FLOW- WITH')
                WRITE (6,700)
      700       FORMAT('B',31X, 'COMPLIANCE')
                CHANGE=ANSWER(I,HISTNO)-ANSWER(I,HISTO)
                CHNG1=ANSWER(I,BASENO)-ANSWER(I,BASEO)
                WRITE (6,710) I,CHANGE,CHNG1
      710       FORMAT('0',13X,I2,16X,'CHANGE',16X,F10.3,16X,F10.3,16X,'NOT
PL
```

```
          CICABLE')
  800       COUNT=COUNT+10
C PRINT RATIOS OF NET PRESENT VALUE OF FUTURE CASH FLOWS
C TO NET WORTH, ROUNDED TO NEAREST HUNDREDTH
          DO 910  I=1,FIRMS
          IF((BASE(I,B80,NW)).LE.0.0)GO TO  900
          HISRAT(I)=.005+ANSWER(I,HISTO)/BASE(I,B80,NW)
          FORRAT(I)=.005+ANSWER(I,FORCSO)/BASE(I,B80,NW)
          BASRAT(I)=.005+ANSWER(I,BASEO)/BASE(I,B80,NW)
          GO TO 910
  900    HISRAT(I)=-99.9999
          BASRAT(I)=-99.9999
          FORRAT(I)=-99.9999
  910     CONTINUE
          WRITE (6,920)
  920    FORMAT('1',20X,'RATIO OF NPVFCF TO NET WORTH')
          WRITE (6,930)
  930    FORMAT('B',20X,28('*'))
          WRITE(6,940)
  940       FORMAT('0','FIRM',3X,'HISTORICAL',5X,'BASELINE',7X,
         C'FORECAST')
          WRITE(6,950)
  950      FORMAT('B',4('*'),3X,10('*'),5X,8('*'),7X,8('*'))
          WRITE (6,960)
  960    FORMAT ('0')
          DO 990 I=1,FIRMS
C SKIP MILWAUKEE(8) AND ROCK ISLAND LINES(9)
             IF(I.EQ.8)GO TO  990
               IF(I.EQ.9)GO TO 990
            IF(HISRAT(I).EQ.-99.9999)GO TO  970
          WRITE(6,1000) I,HISRAT(I),BASRAT(I),FORRAT(I)
           GO TO 990
  970                WRITE(6,980) I
  980         FORMAT('B',I3,8X,3('*',14X))
  990           CONTINUE
  1000        FORMAT('B',I3,4X,4(F7.2,8X))
C  PRINT OUT FIRM BY FIRM INITIAL COSTS
               WRITE(6,1010)
  1010         FORMAT('1','FIRM',5X,'INITIAL COST')
                   DO 1030 I=1,FIRMS
```

```
                              IF(I.EQ.8) GO TO 1030
                              IF(I.EQ.9) GO TO  1030
                               WRITE(6,1020)I,FRCST(I)
C CALCULATE TOTAL INITIAL COST BY SCENARIO
          TOTCST=TOTCST+FRCST(I)
1020                  FORMAT('B',I3,5X,F9.3)
1030                          CONTINUE
C WRITE OUT TOTALS
            WRITE(6,1040)  TOTCST
1040                FORMAT('0','TOTAL',3X,F10.3)
10000    STOP
         END
```

3.5 Verification and Test Procedures

The cash flow model utilizes relatively simple algorithms. These were described in Section 3.2.3. Because the algorithms are relatively simple, calculations may easily be checked using a hand calculator. Another feature of this model is that all intermediate results, such as the present value of the investment costs and extrapolated net worth values, are printed out. Using these intermediate results and a hand calculator one can easily verify the results.

Because the algorithms were verified in the course of developing the software, no specific test procedures can be suggested. Anyone wishing to verify the results can use the algorithms defined in Section 3.2.3, the data which are presented in Appendix A, and should run the program.

If one wishes to modify this model by adding new algorithms, the best procedure to verify the new results is to reduce the number of firms in the data set and to reduce the time horizon of the project. This may be done by altering the first line of the $CN.EPAJHV.S2KC.MISC file, which contains the number of firms, and by altering the seventh line of the file, which contains the time horizon of the project. Reducing the number of firms and the time horizon of the project reduces the complexity of the calculations the model performs. One should also print out the new results. With a small number of firms and a short time horizon, new results should be easily verifiable with a hand calculator.

APPENDIX A: DATA FILES USED BY CASHFLOW

CN.EPAJHV.S2KC.BASE

1.	88.929	.0	1492.023	.0
2.	66.948	29.711	1268.793	19.284
3.	55.626	3.591	1296.919	-.493
4.	55.096	5.931	1316.014	-1.889
5.	75.289	-17.561	1378.135	12.378
6.	92.539	.221	1434.520	28.211
7.	31.805	.0	648.808	.0
8.	53.250	2.908	635.628	14.632
9.	23.085	1.008	658.709	1.217
10.	31.407	5.351	689.807	7.567
11.	85.113	8.185	733.666	1.745
12.	55.029	8.813	778.103	-.052
13.	2.587	.0	84.358	.0
14.	2.550	.0	80.031	1.769
15.	3.123	.0	83.566	4.378
16.	3.663	.0	89.436	3.093
17.	4.011	6.089	106.024	4.980
18.	3.750	.0	113.409	4.155
19.	6.189	.000	.000	.000
20.	-.873	.039	.0	.0
21.	-13.529	.008	.0	.0
22.	-22.927	-.289	.0	.0
23.	-5.614	.0	.0	.0
24.	-.471	.070	.0	.0
25.	38.656	.0	1641.390	.0
26.	82.560	6.201	1628.278	1.190
27.	52.691	2.872	1668.388	7.032
28.	72.580	7.621	1732.937	2.847
29.	74.908	15.923	1876.233	1.355
30.	113.550	22.286	1959.616	1.800
31.	39.392	.0	608.844	.000
32.	89.700	55.898	559.214	15.578
33.	83.818	26.917	603.217	-3.261
34.	99.171	40.484	661.701	-9.397
35.	89.898	60.004	688.611	13.135
36.	68.865	36.386	778.846	-2.283
37.	15.260	.000	30.502	.0
38.	-.983	2.177	25.698	-2.069
39.	-16.323	-2.078	9.375	-4.985
40.	3.050	.000	12.425	.793

41.	-.460	.000	21.235	-.242
42.	-15.910	.000	28.742	-.603
43.	3.405	.000	320.738	.000
44.	11.402	12.301	343.340	1.767
45.	-21.067	-5.692	321.227	-4.382
46.	-12.079	3.004	309.148	.000
47.	-36.247	13.230	282.231	2.258
48.	-65.167	10.895	206.526	.000
49.	-14.980	.000	226.374	.000
50.	-23.097	.117	202.810	.000
51.	-31.166	-.656	171.644	.000
52.	-25.047	-.040	146.597	.000
53.	-34.834	-1.195	111.768	.000
54.	-21.162	.681	81.790	.000
55.	.000	.000	.000	.000
56.	.000	.000	.000	.000
57.	.000	.000	.000	.000
58.	.000	.000	.000	.000
59.	.000	.000	.000	.000
60.	.000	.000	.000	.000
61.	-.069	-2.834	60.086	.000
62.	-.102	-3.342	71.991	.450
63.	3.308	2.005	73.811	.331
64.	2.623	.542	74.353	1.100
65.	5.222	2.146	76.426	.105
66.	3.375	5.765	79.089	-.097
67.	-418.847	9.576	211.153	.000
68.	-632.352	-1.472	-264.343	.000
69.	-681.484	7.535	-168.568	.000
70.	-418.847	9.576	211.153	.000
71.	-632.352	-1.472	-264.343	.000
72.	-681.484	7.885	-168.568	.000
73.	2.410	.000	46.846	.000
74.	.990	.007	46.040	.531
75.	-1.697	-.234	44.361	-.741
76.	-3.576	-.003	40.785	-.915
77.	-12.028	.008	28.757	.000
78.	-11.668	-.001	17.089	.000
79.	18.051	.000	204.125	.000
80.	20.589	3.823	180.449	1.334

81.	13.947	-.263	186.167	3.625
82.	16.603	.395	194.423	2.725
83.	19.493	.432	205.247	1.922
84.	24.501	.578	220.598	1.561
85.	-2.526	.000	62.572	.000
86.	-2.987	-4.154	61.070	.000
87.	-11.717	-.099	44.766	.256
88.	-1.717	.027	43.049	-.045
89.	2.259	.081	45.308	-.006
90.	3.103	.107	48.411	-.404
91.	11.141	.000	107.577	.000
92.	11.562	.000	99.534	1.520
93.	3.670	.000	88.800	3.034
94.	2.858	.000	85.658	2.379
95.	-2.861	.000	77.797	2.747
96.	6.322	.000	83.619	.000
97.	11.161	.000	73.660	.000
98.	13.055	.000	71.184	1.265
99.	4.098	.000	68.282	1.196
100.	9.298	.000	71.580	8.131
101.	9.750	.000	75.529	3.962
102.	15.038	.000	85.066	2.275
103.	7.214	.000	79.483	.000
104.	6.153	.126	83.793	.600
105.	6.801	.218	90.594	.773
106.	2.810	.132	93.404	.678
107.	6.532	-.383	99.936	2.054
108.	13.124	.382	113.060	3.153
109.	-.392	.000	33.155	.000
110.	-3.349	-.008	29.806	-.034
111.	1.913	.000	31.811	-.077
112.	.542	.000	32.353	-.034
113.	2.146	.000	34.499	-.034
114.	5.764	.000	40.263	.000
115.	-10.979	.000	-229.880	.000
116.	-7.939	.066	-233.047	.000
117.	-7.244	.061	-240.291	.000
118.	-1.738	.195	-240.102	.000
119.	1.711	.102	21.711	.000
120.	7.921	.179	228.362	.000

121.	45.132	.000	742.620	.000
122.	29.474	.589	670.803	.000
123.	1.080	2.535	665.337	4.112
124.	15.227	2.024	676.860	-.245
125.	3.339	1.665	692.559	1.783
126.	-1.972	-.566	682.190	.000
127.	-.253	.000	138.610	.000
128.	2.803	-.249	114.526	.980
129.	1.327	.019	115.771	.200
130.	2.433	-.159	118.204	.790
131.	8.396	.153	124.055	4.375
132.	14.382	.135	133.669	4.494
133.	-77.387	.000	.000	153.942
134.	-109.727	.000	.000	140.817
135.	-128.560	.000	.000	129.671
136.	-120.414	.000	.000	106.888
137.	-121.566	.000	.000	102.584
138.	-164.779	.000	.000	55.506
139.	37.007	.000	586.722	.000
140.	25.501	.240	507.179	11.355
141.	23.887	-.131	515.327	8.028
142.	27.146	-.873	529.123	-.295
143.	20.272	1.012	538.009	-.663
144.	-31.198	.699	506.811	1.044
145.	25.505	.000	406.816	.000
146.	49.722	10.293	432.888	4.272
147.	46.715	-13.432	465.842	-.467
148.	68.696	14.886	532.717	8.481
149.	108.882	-.449	619.916	12.298
150.	101.139	2.534	687.884	13.790
151.	-8.196	.000	-13.048	.000
152.	-2.560	.437	-14.197	.000
153.	-5.310	.397	-20.866	.000
154.	-5.766	.425	-27.930	.000
155.	-5.572	.653	-34.912	.000
156.	2.405	.524	-33.916	.000
157.	68.790	.000	1170.422	.000
158.	113.211	8.671	970.477	27.844
159.	87.506	-.460	1006.478	28.236
160.	131.522	.170	1084.671	3.976

161.	103.435	-8.173	1132.050	15.099
162.	167.597	21.168	1238.139	-13.339
163.	10.478	.000	215.221	.000
164.	11.939	-.160	160.603	-.500
165.	6.179	-.996	160.094	-1.253
166.	6.772	-1.539	163.408	-2.299
167.	7.154	-.347	166.311	-1.275
168.	7.707	-1.141	169.081	-.830
169.	11.454	.000	254.178	.000
170.	16.322	1.654	215.616	1.940
171.	8.870	-.300	217.697	1.300
172.	11.956	.143	223.540	1.635
173.	16.716	1.432	134.044	.000
174.	20.617	.269	239.078	.000
175.	38.997	.000	352.971	.000
176.	34.537	.709	281.427	9.741
177.	26.616	.363	272.764	7.884
178.	38.982	.518	293.571	-.048
179.	30.780	-.021	293.290	14.439
180.	32.898	.032	290.832	2.492
181.	76.375	.000	964.873	.000
182.	98.214	57.512	1041.589	5.884
183.	47.336	17.735	1064.941	2.562
184.	85.373	29.126	1125.939	1.053
185.	103.037	27.730	1193.219	-.941
186.	69.354	-5.986	1129.682	-1.898
187.	17.620	.000	168.687	.000
188.	14.307	.268	145.931	3.000
189.	10.413	.261	150.394	2.200
190.	16.201	.203	159.000	2.600
191.	18.802	.144	168.054	2.955
192.	23.323	.291	179.730	4.000
193.	81.758	.000	1553.293	.000
194.	88.232	-1.962	1399.511	17.095
195.	52.627	3.669	1437.965	9.535
196.	81.263	24.053	1542.851	-2.579
197.	79.586	-2.689	1558.383	21.791
198.	49.369	-5.590	1555.069	1.635
199.	125.724	.000	1504.062	.000
200.	99.171	-1.257	1214.037	30.143

201.	83.880	-2.224	1256.714	31.758
202.	106.156	2.051	1297.075	-15.739
203.	116.262	2.199	1347.542	39.697
204.	141.801	4.342	1421.977	16.315
205.	3.342	.000	94.302	.000
206.	10.745	1.248	83.988	.120
207.	3.251	1.541	85.348	.460
208.	2.784	1.463	86.440	.443
209.	6.110	-3.048	82.704	.021
210.	7.238	-.022	88.255	-.909
211.	5.629	.000	145.167	.000
212.	3.381	.000	123.376	.364
213.	1.281	.000	123.557	1.012
214.	1.975	.000	122.384	-.873
215.	4.814	.000	124.198	-.385
216.	-110.104	.000	11.694	.185
217.	7.222	.000	108.888	0.000
218.	7.213	-.223	169.287	2.879
219.	5.265	-.019	92.194	2.363
220.	6.294	-.031	93.107	2.352
221.	5.485	.036	94.108	1.818
222.	7.804	-.004	97.464	2.173
223.	15.555	.000	52.210	.000
224.	14.057	.173	208.095	3.307
225.	10.458	.146	127.439	4.872
226.	9.266	-.074	136.705	5.409
227.	15.570	.049	152.275	5.463
228.	23.125	-.042	175.400	6.361
229.	.000	.000	.000	.000
230.	.000	.000	.000	.000
231.	.000	.000	.000	.000
232.	.000	.000	.000	.000
233.	.000	.000	.000	.000
234.	.000	.000	.000	.000
235.	66.313	.000	798.606	.000
236.	92.849	52.736	913.064	18.197
237.	81.096	36.509	969.060	12.328
238.	92.549	41.023	1022.824	12.538
239.	110.546	48.462	1092.780	14.383
240.	93.608	34.673	1180.574	17.622

CN.EPALYG.S2KC.CAST8ONE

(For illustrative purposes only-
not actual data.)

1.	1980 50	
2.	107.49957	107.49995
3.	51.43221	51.43245
4.	22.70284	22.70284
5.	0.67061	0.67061
6.	98.55872	98.55910
7.	46.79529	46.79567
8.	-3.72370	-3.72331
9.	-41.18745	-41.18745
10.	-10.02529	-10.02516
11.	1.44813	1.44816
12.	2.89137	2.89140
13.	-440.53784	-440.53564
14.	-6.94858	-6.94857
15.	29.22343	29.22348
16.	2.61902	2.61903
17.	10.23697	10.23699
18.	19.06380	19.06381
19.	13.80169	13.80169
20.	4.86236	4.86239
21.	7.39483	7.39485
22.	7.56818	7.56856
23.	15.96705	15.96706
24.	-32.96289	-32.96289
25.	-9.05302	-9.05264
26.	116.47823	116.47847
27.	-0.76179	-0.76178
28.	181.45230	181.45255
29.	8.49030	8.49031
30.	20.46555	20.46567
31.	29.28189	29.28189
32.	55.73378	55.73402
33.	28.25069	28.25081
34.	56.75208	56.75246
35.	171.29514	171.29538
36.	7.95957	7.95958
37.	-137.23051	-137.23050
38.	9.29603	9.29606
39.	27.54451	27.54453
40.	20.21671	20.21671

41.	111.15385	111.15436
42.	1985 50	
43.	176.23549	176.23636
44.	84.39194	84.39206
45.	28.45317	28.45319
46.	3.21631	3.21633
47.	179.32349	179.32477
48.	68.47649	68.47679
49.	15.30742	15.30758
50.	-36.63016	-36.63002
51.	0.33021	0.33034
52.	4.78180	4.78182
53.	4.89966	4.89968
54.	-419.72266	-419.72168
55.	-5.05990	-5.05987
56.	41.80083	41.80090
57.	4.90590	4.90590
58.	14.55127	14.55128
59.	19.84094	19.84097
60.	17.97664	17.97665
61.	7.72003	7.72007
62.	13.34058	13.34067
63.	30.87209	30.87250
64.	24.45009	24.45010
65.	-33.83386	-33.83389
66.	20.79004	20.79034
67.	175.43146	175.43190
68.	3.66994	3.66996
69.	226.86703	226.86752
70.	12.04803	12.04803
71.	37.70987	37.70993
72.	41.66156	41.66173
73.	96.33096	96.33125
74.	41.42615	41.42625
75.	118.92110	118.92169
76.	252.34174	252.34253
77.	10.92750	10.92752
78.	-131.21501	-131.21495
79.	13.76659	13.76662
80.	36.14720	36.14725

81.	27.66631	27.66634
82.	152.23999	152.24040
83.	1990 50	
84.	236.92830	236.92917
85.	113.82509	113.82559
86.	33.33595	33.33598
87.	5.61683	5.61685
88.	251.59129	251.59193
89.	88.40968	88.40999
90.	32.95085	32.95113
91.	-31.15666	-31.15627
92.	10.11080	10.11093
93.	7.67766	7.67768
94.	6.77377	6.77380
95.	-389.62256	-389.61963
96.	-3.19934	-3.19929
97.	52.63115	52.63136
98.	6.99870	6.99872
99.	18.32077	18.32077
100.	20.81329	20.81332
101.	21.56261	21.56262
102.	10.24672	10.24675
103.	18.80238	18.80246
104.	52.32866	52.32895
105.	31.94798	31.94812
106.	-34.41727	-34.41730
107.	47.80467	47.80510
108.	226.80511	226.80556
109.	7.74921	7.74924
110.	266.81860	266.81885
111.	15.11285	15.11283
112.	52.93440	52.93459
113.	52.37173	52.37178
114.	132.10768	132.10811
115.	52.88072	52.88083
116.	174.94983	174.95053
117.	322.46606	322.46680
118.	13.53755	13.53759
119.	-125.85890	-125.85884
120.	17.63596	17.63597

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121.	43.43253	43.43254
122.	34.08081	34.08084
123.	188.10962	188.11015
124.	2000 50	
125.	392.74048	392.74097
126.	189.89168	189.89168
127.	45.57524	45.57527
128.	12.01120	12.01123
129.	438.55127	438.55298
130.	140.78168	140.78198
131.	79.51987	79.52052
132.	-14.90451	-14.90425
133.	36.19136	36.19174
134.	15.03882	15.03883
135.	11.73750	11.73757
136.	-294.57300	-294.57007
137.	1.87067	1.87071
138.	80.01535	80.01543
139.	12.48334	12.48336
140.	27.93442	27.93442
141.	23.74371	23.74373
142.	30.61478	30.61481
143.	16.73779	16.73785
144.	33.14771	33.14778
145.	108.74869	108.74910
146.	51.20668	51.20682
147.	-35.63403	-35.63406
148.	118.17090	118.17159
149.	357.66504	357.66602
150.	18.47356	18.47357
151.	369.15894	369.15918
152.	22.86417	22.86417
153.	92.01759	92.01804
154.	79.53171	79.53188
155.	223.85229	223.85272
156.	82.01344	82.01367
157.	320.52344	320.52344
158.	500.30688	500.30737
159.	20.22136	20.22137
160.	-112.04002	-112.03995

161.	27.45103	27.45107
162.	61.66394	61.66396
163.	50.29973	50.29979
164.	279.56592	279.56592
165.	2010 50	
166.	613.85083	613.85205
167.	298.96948	298.96973
168.	62.28395	62.28397
169.	21.60178	21.60182
170.	707.04761	707.04980
171.	217.78024	217.78043
172.	148.44600	148.44652
173.	13.06591	13.06616
174.	75.37399	75.37424
175.	25.32076	25.32079
176.	19.12080	19.12088
177.	-120.06679	-120.06403
178.	9.72117	9.72120
179.	117.93907	117.93929
180.	20.51707	20.51707
181.	41.43140	41.43143
182.	28.87038	28.87039
183.	43.11592	43.11597
184.	25.95860	25.95863
185.	54.23022	54.23030
186.	191.79515	191.79582
187.	78.55658	78.55672
188.	-36.73451	-36.73442
189.	220.30066	220.30161
190.	541.09131	541.09204
191.	34.25360	34.25374
192.	513.89380	513.89404
193.	33.60316	33.60318
194.	147.47826	147.47870
195.	117.32680	117.32697
196.	353.83130	353.83154
197.	122.74350	122.74373
198.	530.99390	530.99390
199.	747.81055	747.81104
200.	29.66814	29.66812

201.	-92.27606	-92.27599
202.	41.11560	41.11560
203.	86.48598	86.48602
204.	72.76271	72.76280
205.	407.93848	407.93848

CN.EPALYG.S2KC.GNPDEF

1.	105.8
2.	116.0
3.	127.2
4.	133.8
5.	141.6
6.	152.1
7.	169.5
8.	188.8

?

CN.EPAJHV.S2KC.MISC

1. 40
2. .46
3. .10
4. .11
5. .08
6. 1984
7. 31

CN.EPAJHV.S2KC.PVCST1

1.	0.011253	0.002673	0.001843	0.001303
2.	0.170800	0.041300	0.027900	0.026700
3.	0.0	0.0	0.0	0.0
4.	0.0	0.0	0.0	0.0
5.	0.0	0.0	0.0	0.0
6.	0.0	0.0	0.0	0.0
7.	0.0	0.0	0.0	0.0
8.	0.0	0.0	0.0	0.0
9.	0.0	0.0	0.0	0.0
10.	0.0	0.0	0.0	0.0
11.	0.0	0.0	0.0	0.0
12.	0.007600	0.010300	0.009500	0.005700
13.	0.0	0.0	0.0	0.0
14.	0.0	0.0	0.0	0.0
15.	0.0	0.0	0.0	0.0
16.	0.0	0.0	0.0	0.0
17.	0.151600	0.018300	0.008400	0.001000
18.	0.0	0.0	0.0	0.0
19.	0.0	0.0	0.0	0.0
20.	0.0	0.0	0.0	0.0
21.	0.0	0.0	0.0	0.0
22.	0.007600	0.010300	0.009500	0.005700
23.	0.0	0.0	0.0	0.0
24.	0.0	0.0	0.0	0.0
25.	0.0	0.0	0.0	0.0
26.	0.0	0.0	0.0	0.0
27.	0.0	0.0	0.0	0.0
28.	0.0	0.0	0.0	0.0
29.	0.0	0.0	0.0	0.0
30.	0.0	0.0	0.0	0.0
31.	0.0	0.0	0.0	0.0
32.	0.170800	0.041300	0.027900	0.026700
33.	0.011253	0.002673	0.001843	0.001303
34.	0.011253	0.002673	0.001843	0.001303
35.	0.011253	0.002673	0.001843	0.001303
36.	0.011253	0.002673	0.001843	0.001303
37.	0.011253	0.002673	0.001843	0.001303
38.	0.011253	0.002673	0.001843	0.001303
39.	0.011253	0.002673	0.001843	0.001303
40.	0.011253	0.002673	0.001843	0.001303

41.	0.011253	0.002673	0.001843	0.001303
42.	0.011253	0.002673	0.001843	0.001303
43.	0.012134	0.003867	0.002944	0.001964
44.	0.012134	0.003867	0.002944	0.001964
45.	0.012134	0.003867	0.002944	0.001964
46.	0.012134	0.003867	0.002944	0.001964
47.	0.012134	0.003867	0.002944	0.001964
48.	0.034087	0.006517	0.004161	0.002109
49.	0.034087	0.006517	0.004161	0.002109
50.	0.034087	0.006517	0.004161	0.002109
51.	0.034087	0.006517	0.004161	0.002109
52.	0.034087	0.006517	0.004161	0.002109
53.	0.035989	0.009094	0.006538	0.003535
54.	0.035989	0.009094	0.006538	0.003535
55.	0.035989	0.009094	0.006538	0.003535
56.	0.035989	0.009094	0.006538	0.003535
57.	0.035989	0.009094	0.006538	0.003535
58.	0.035989	0.009094	0.006538	0.003535
59.	0.035989	0.009094	0.006538	0.003535
60.	0.035989	0.009094	0.006538	0.003535
61.	0.035989	0.009094	0.006538	0.003535
62.	0.035989	0.009094	0.006538	0.003535
63.	0.113236	0.026900	0.018548	0.013115

CN.EPALYG.S2KC.YDINV

1.	1	4	48	23	93
2.	2	7	53	32	76
3.	3	0	4	1	0
4.	4	1	6	10	2
5.	5	10	78	53	136
6.	6	5	41	19	38
7.	7	1	55	33	47
8.	8	0	0	0	0
9.	9	0	0	0	0
10.	10	0	0	0	0
11.	11	0	2	3	7
12.	12	29	160	178	310
13.	13	0	8	7	3
14.	14	1	3	4	24
15.	15	1	3	4	3
16.	16	0	3	3	2
17.	17	1	3	3	6
18.	18	0	3	2	3
19.	19	0	4	0	6
20.	20	0	11	7	1
21.	21	4	41	30	39
22.	22	0	7	5	15
23.	23	1	1	1	0
24.	24	4	25	34	30
25.	25	4	45	23	104
26.	26	0	11	2	21
27.	27	7	62	34	59
28.	28	0	4	4	6
29.	29	2	15	12	46
30.	30	1	9	1	12
31.	31	3	34	55	61
32.	32	0	18	7	16
33.	33	8	26	36	139
34.	34	4	27	19	84
35.	35	1	5	1	17
36.	36	0	4	4	12
37.	37	0	0	0	0
38.	38	1	2	5	23
39.	39	0	0	1	1
40.	40	8	26	30	69

APPENDIX B

CORRESPONDENCE OF FIRMS TO FIRM NUMBER

To save programming time, each firm was assigned a number. This number is printed instead of the firm's name. This number appears in the first column of output in each set of firm-specific results.

The correspondence of each firm to its number is shown in the list below:

1. Atchison, Topeka and Santa Fe
2. Baltimore and Ohio
3. Bessemer and Lake Erie
4. Boston and Maine
5. Burlington Northern
6. Chesapeake and Ohio
7. Chicago and North Western
8. Chicago, Milwaukee, St. Paul and Pacific
9. Chicago, Rock Island, and Pacific
10. Clinchfield
11. Colorado and Southern
12. Conrail
13. Delaware and Hudson
14. Denver and Rio Grande Western
15. Detroit, Toledo, and Ironton
16. Duluth, Misabe, and Iron Range
17. Elgin, Joliet, and Eastern
18. Florida East Coast
19. Fort Worth and Denver
20. Grand Trunk Western
21. Illinois Central Gulf
22. Kansas City Southern
23. Long Island Railroad
24. Louisville and Nashville
25. Missouri Pacific
26. Missouri-Kansas-Texas
27. Norfolk and Western
28. Pittsburgh and Lake Erie
29. St. Louis - San Francisco
30. St. Louis - Southwestern
31. Seaboard Coast Line
32. Soo Line
33. Southern Pacific
34. Union Pacific

35. Western Maryland
36. Western Pacific
37. Alabama Great Southern
38. Central of Georgia
39. Cincinnati, New Orleans, Texas Pacific
40. Southern Railway

For example, firm 1 is the Atchison, Topeka and Santa Fe.

APPENDIX C:

ERRATA SHEETS

1. Delete the last paragraph on page 3-1. It begins with "The cash flow model. . ." and ends with ". . .accessed by typing." Replace with:

The cash flow model is stored at the EPA's Washington Computer Center. Hardware there includes an IBM 370/168 model 1 with six million bytes of main memory and an IBM model 3032 with six million bytes of main memory. The source code is located in the file:

CN.EPAJHV.S2KC.CASHFLOW

It is accessed by typing:

2. Insert the section below after the first sentence of the third paragraph on page 3-2. This sentence ends with ". . . of the area EPAJHV.S2KC." At the end of the inserted section, start a new paragraph. The new paragraph begins with "To run CASHFLOW, one . . ."

<u>Inserted section</u>:

RUNCASH is stored in the file:

CN.EPAJHY.S2KC.RUNCASH

at EPA's Washington Computer Center.

The Job Control Language (JCL) source code of RUNCASH is:

```
//EPAJHVSK JOB (S2KC,MLYG),'STEWARTKAGAN',PRTY=5,TIME=5
/*ROUTE PRINT HOLD
//EXEC FTG1CLG,GREGION=400K,LPARM='NOSOURCE'
//FORT.SYSIN DD DSN=CN.EPAJHV.S2KC.CASHFLOW,DISP=SHR
//GO.FT01F001 DD DSN=CN.EPALYG.S2KC.YDINV,DISP=SHR
//GO.FT02F001 DD DSN=CN.EPALYG.S2KC.GNPDEF,DISP=SHR
//GO.FT03F001 DD DSN=CN.EPAJHV.S2KC.PVCST1,DISP=SHR
//GO.FT24F001 DD DSN=CN.EPALYG.S2KC.CAST8ONE,DISP=SHR
//GO.FT21F001 DD DSN=CN.EPAJHV.S2KC.MISC,DISP=SHR
//GO.FT22F001 DD DSN=CN.EPAJHV.S2KC.BASE,DISP=SHR
//GO.FT06F001 DD SYSOUT=A
```

3. Replace Figure 1 on page 3-9 with the attached figure.

4. Replace Table 3-3 on pages 3-17 and 3-18 with the table below.

5. Replace the text of section 3.2.2.1 on page 3-2 with the following text:

The cash flow model requires six data files to operate. Multiple data files were used to allow easy access to individual datums and to separate the data by function.

Table 3-1 summarizes the names, nature, contents and sources of each data file. Three of the files are never changed. They contain firm by firm railyard inventories, the Gross National Product Deflators for the years 1973-1978 and historical financial data on the individual railroad firms. One file, CN.EPAJHV.S2KC.MISC contains key financial parameters and CN.EPAJHV.52KC.PVCSTX (where X is 1,2,3,...8) and CN.EPAJHV.52KC.CASTXXX (where XXX is ONE TWO,THR,...EIG) contain data which change with each regulatory scenario under evaluation.

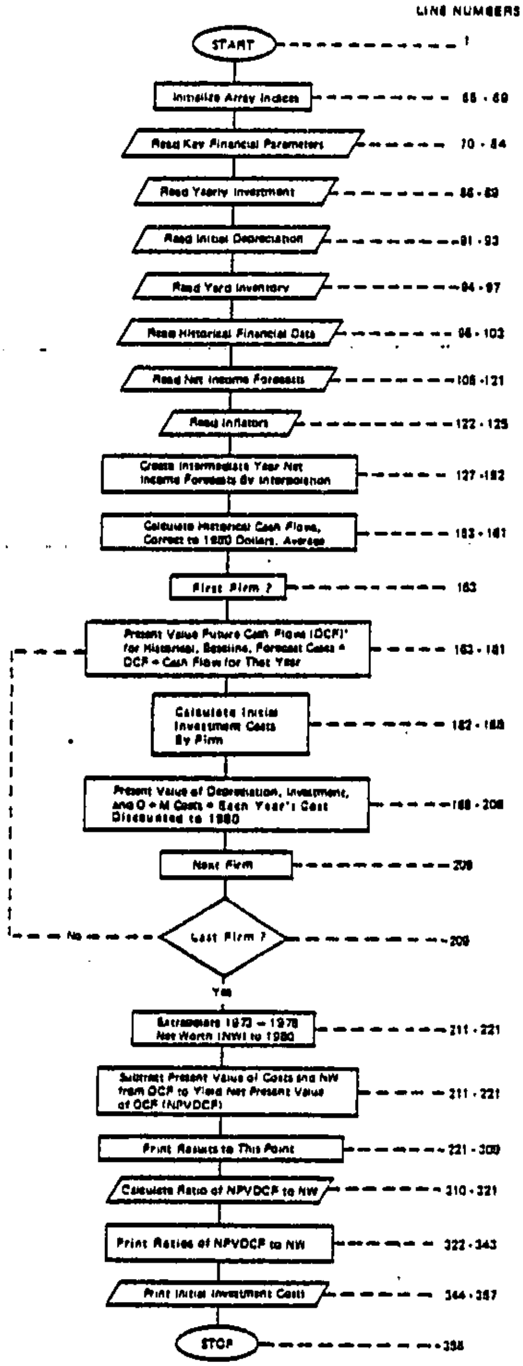

Figure 1. Flow Diagram of Railroad Cashflow Model.

TABLE 3-3

ARRAY DEFINITIONS

ARRAY	DIMENSION	FORTRAN TYPE	DEFINITION
YDCST	(40,6)	Real	Yearly investment in 1980 dollars by yard type, beginning in first year of compliance
YDDEP	(40,6)	Real	Yearly depreciation by yard type in nominal dollars, beginning in 1980.
BASE	(60,78)	Real	Basic historical financial data 1973-1978 by firm
IYEAR	(15)	Integer	Tells which year individual net income forecasts correspond to
YDINV	(50,5)	Integer	Firm-by-firm inventory by yard type (Hump, Flat Classification, Flat Industrial)
HISRAT	(50)	Real	Ratio of net present value of future cash flows to firm net worth, historical basis
BASRAT	(50)	Real	Ratio of net present value of future cash flows to firm net worth, baseline forecast basis
FORRAT	(70)	Real	Ratio of net present value of future cash flows to net worth, post-compliance forecast
PVINV	(70)	Real	Present value of investment costs, by firm
PVDEP	(70)	Real	Present value of depreciation, by firm

TABLE 3-3 (cont.)

ARRAY	DIMENSION	FORTRAN TYPE	DEFINITION
INIINV	(6)	Real	Initial investment costs by yard type
PVCF	(70,3)	Real	Present value of cash flows. Rows: firms. Colums: historical basis, baseline forecast basis, post-compliance forecast basis
PVOM	(70)	Real	Present value of operating and maintenance expenses
FRCAST	(70)	Real	First-year investment cost by firm
PVNW	(70)	Real	1973-1978 net worth extrapolated to 1980, linearly
GNPDEF	(8)	Real	Gross National Product Deflators 1973-1978
INCOME	(60,60)	Real	Post-compliance net income forecast 1980-2010, by firm, by year
BASINC	(60,60)	Real	Baseline forecast net income forecast 1980-2010, by firm, by year
ANSWER	(70,5)	Real	Columns: Net present value of future cash flows, historical basis before and after compliance, baseline forecast before and after compliance, post-compliance forecast after compliance. Rows: Firms

6. Replace Table 3-1 on page 3-3 with the attached table.

7. Add this sentence to the second paragraph on page 3-4:

"The GNP deflators must be greater than zero and less than 1,000.

8. Add this sentence to the first paragraph on page 3-5.

"The allowable range of costs in this file is 0 to 99.9999999 (expressed in millions)."

9. Add this sentence after the last sentence of the last paragraph on page 3-5.

"The allowable range of this data is +9999.99999 to -999.99999 (expressed in millions) and the format code is 2(F10.5,2X).

10. Change the last sentence of the second paragraph on page 3-6 from:

"The parameters, in order, and their respective format codes are shown in Table 3-2." to:

"The parameters, in order, their range of allowable input and their format codes are shown in Table 3-2."

11. Replace Table 3-2 on page 3-7 with the attached version of Table 3-2.

12. Add this sentence to the last paragraph of page 3-9:

"The range of allowable input is 999999.999 to -99999.999 for net income and net worth, and 99999.999 to -9999.999 for equity in undistributed earnings of affiliates and deferred taxes (expressed in millions)."

TABLE 3-1

DATA FILES SUMMARY

FILE NAME	NATURE	CONTENTS	SOURCE
CN.EPALYG.S2KC.YDINV	Never changes	Firm-by-firm yard inventory	Reference 1 below
CN.EPALYG.S2KC.GNPDEF	Never changes	Gross National Product Deflators, 1973-1980	U.S. Department of Commerce
CN.EPAJHV.S2KC.PVCSTX; X may be 1,2,3,. . .8	Changes for each regulatory scenario	Yearly investment and depreciation charges, by yard type	Energy Resources Co. Inc. (ERCO)
CN.EPALYG.S2KC.CAST8XX; where XXX, is ONE, TWO, THR, FOU, FIV, SIX, SEV OR EIG	Changes for each scenario	Net income forecasts - baseline and after regulation	Energy Resources Co. Inc. (ERCO)
CN.EPAJHV.S2KC.BASE	Never changes	Historical financial data	Assembled by Synergy, Inc.
CN.EPAJHV.S2KC.MISC	Can be changed	Financial Parameters	Energy Resources Co. Inc. (ERCO) Department of Commerce

[1]United States Environmental Protection Agency, Background Document for Final Interstate Rail Carrier Noise Emission Regulation: Source Standards. EPA 550/9-79-210, December 1979. Appendix F.

TABLE 3-2

KEY FINANCIAL PARAMETERS: FILE EPAJHV.S2KC.MISC

	DATA ITEM	RANGE OF ALLOWABLE INPUT	FORMAT CODE
1.	Number of Firms	1 to 99	I2
2.	Corporate Tax Rate	.99 to 0	F3.2
3.	Investment Tax Credit	.99 to 0	F3.2
4.	Discount Rate	.99 to 0	F3.2
5.	Inflation Rate	.99 to 0	F3.2
6.	Construction Year	1980 to 2011	I4
7.	Project Time Horizon	1 to 31	I2