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**NATIONAL UTILITY FINANCIAL
STATEMENT MODEL (NUFS)**

Volume II of III:
User's Guide

FINAL REPORT

Submitted to:
Division of Coal and Electric Power
Energy Information Administration
U.S. Department of Energy

Prepared Under Contract No. DEAC-01-79EI-10579

October 29, 1981

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(NUFS)

Volume II of III: User's Guide

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SUMMARY

This volume is a User's Guide for the National Utility Financial Statement Model (NUFS). This is the second of three volumes describing NUFS provided by ICF Incorporated under contract DEAC-01-79EI-10579. The three volumes are entitled:

- Model Overview and Description
- User's Guide
- Software Description

This volume:

- describes each necessary input file,
- discusses user options, and
- describes the job stream necessary to run the model.

I. INTRODUCTION

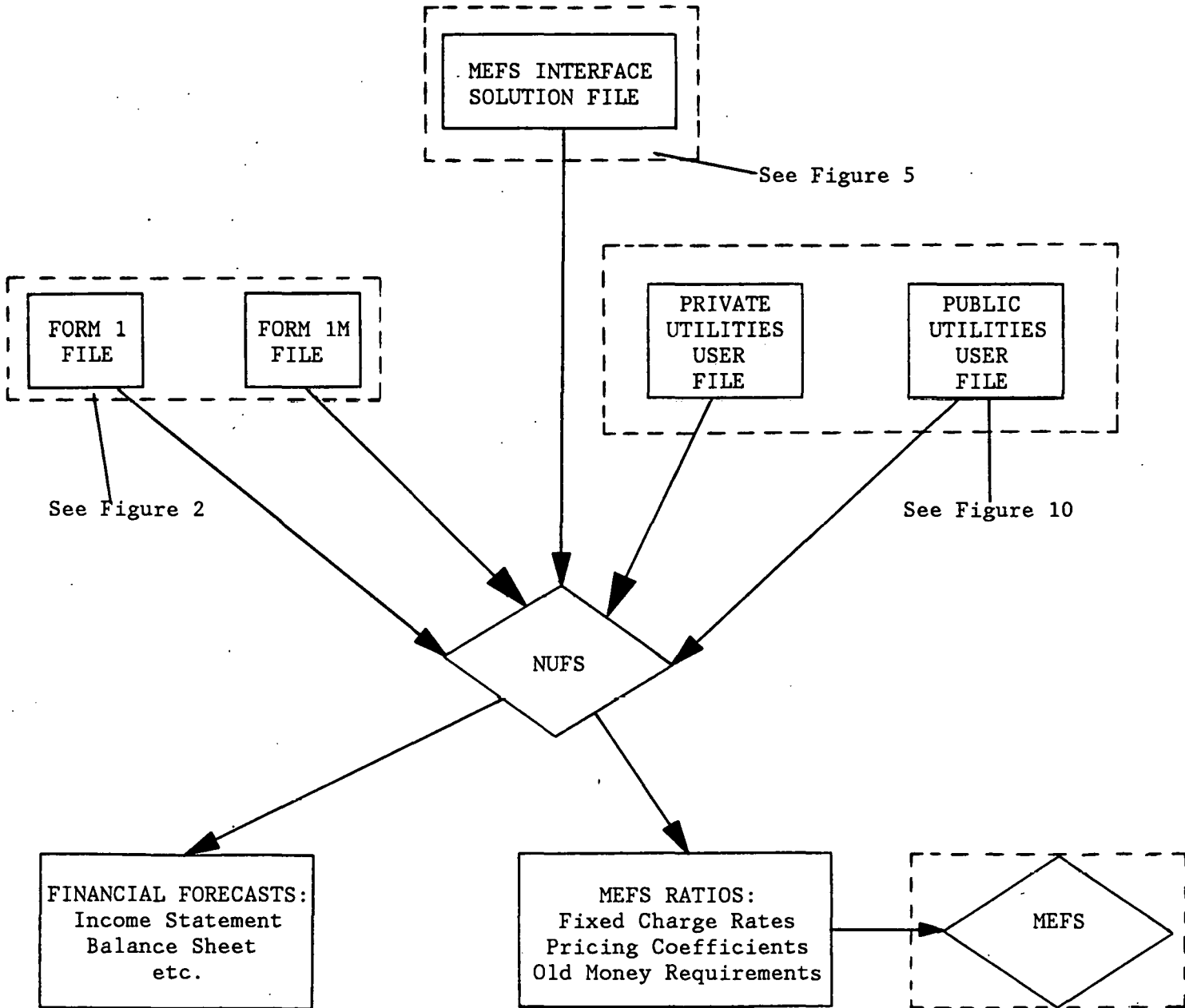
The National Utility Financial Statement (NUFS) model produces financial forecasts for the electric utility industry. Primarily designed to be used in analysis by the Department of Energy (DOE), NUFS will produce these forecasts for each of the ten DOE regions as well as the nation as a whole.^{1/} The primary and driving input to NUFS is the generating capacity expansion plan for the industry. To supply this input, NUFS has been designed to interface with the Midterm Energy Forecasting System (MEFS), from which a given plan is taken. In addition, NUFS has been designed to supply inputs into the MEFS iterative solution process. The NUFS methodology is documented in Volume One of this three volume set. The purpose of this volume is to provide operating instruction and documentation for the potential NUFS user.

The flow of data for NUFS is shown in Figure 1.^{2/} For each region to be run, NUFS requires five input data files. These files may be grouped into three categories: (1) Form 1/Form 1M files; (2) user supplied input files; and (3) MEFS interface solution files. To run NUFS for a given region, each of these five files must be supplied. The remainder of this guide will describe these files and is organized into four sections. These four sections are entitled: II. Preparation of Form 1/Form 1M Files; III. Preparation of MEFS interface solution file; IV. Preparation of user supplied input files; and finally V. Running NUFS. The later section discusses the steps in running NUFS given that the five input files have been created.

^{1/} These levels of aggregation for the forecasts are not binding. By altering data inputs, the forecasts may be produced at any level (state, individual utility, etc.).

^{2/} The format of all data flow diagrams is the same. A rectangular shaped box will represent actual data while a diamond shaped box will represent computer software.

FIGURE 1
OVERALL FLOW OF DATA FOR NUF3



II. PREPARATION OF FORM 1/FORM 1M FILES

NUFS requires various financial data from the base year (i.e. year before forecast begins) financial statements. This includes such financial accounts as Revenues, Net Income, and Deferred Taxes. All of this data is reported annually to the Federal Energy Regulatory Commission (FERC) via the Form 1 for privately owned utilities and the Form 1M for publicly owned utilities. All of this data must be aggregated from the utility specific data provided by the Form 1 and Form 1M and entered into NUFSS at the DOE regional and national level. As each calendar year passes, this data should be updated to reflect the most current available data. This involves two major activities: 1) aggregating the utility specific data to regional and national level; and (2) entering data into appropriate files.

To do this by hand would be both time consuming and tedious. Fortunately this process has been totally computerized. The Energy Information Administration (EIA) has two computer tapes prepared annually which make this possible. The first contains the financial statements for each major privately owned utility in the United States (the Form 1 tape), while the second contains the statements for each major publicly owned utility (the Form 1M tape). Two pieces of software have been created to read these tapes and perform the two activities identified above. The two software programs are entitled NUFSS.FORM1.FORT and NUFSS.FORM1M.FORT. The flow of data for the creation of the Form 1 and Form 1M files is shown in Figure 2.

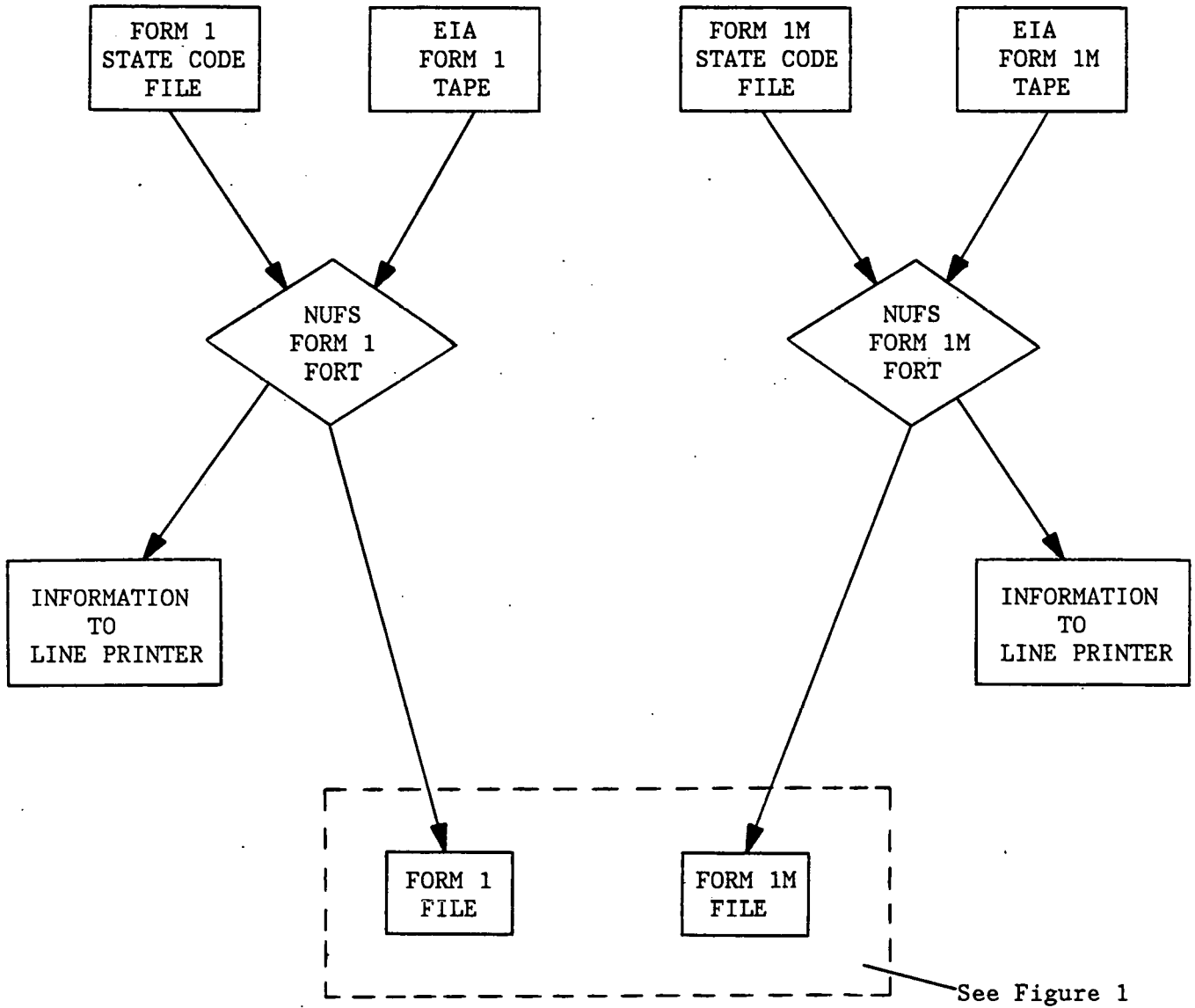
The software packages are designed for user ease. Each package is entirely self contained and documented. The packages are set up to be submitted as batch jobs. The user need only supply data file names in the Job Control Language (JCL) statements and submit the job.

When submitted, each package creates a partitioned data set (PDS) with eleven members (one for each DOE region plus nation). Each package need only be submitted once to produce the files for all regions. The data sets should be entitled NUFSS.FORM1.PDS\$\$\$ and NUFSS.FORM1M.PDS\$\$\$ (\$\$ = base year, e.g. 78, 79, or 80). The member names should follow the MEFS naming convention for regions:

- U1 = DOE Region #1
- U2 = DOE Region #2
- U3 = DOE Region #3
- U4 = DOE Region #4
- U5 = DOE Region #5
- U6 = DOE Region #6
- U7 = DOE Region #7
- U8 = DOE Region #8
- U9 = DOE Region #9
- UA = DOE Region #10
- UT = Nation

FIGURE 2

DATA FLOW FOR FORM1/FORM 1M FILES



An example would be NUF.S.FORM1.PDS78:UT. This would be the privately owned utilities 1978 data needed by NUF.S aggregated to the national level.

The files which are created from the Form 1 tape are slightly different from those created by the Form 1M. For example, one piece of information in the Form 1 files is the amount of deferred income taxes. This information is not contained in the Form 1M files because public utilities do not pay income taxes. Samples of each of these files are shown in Figures 3 and 4.

As shown in Figure 2, the software prints out data on the line printer. This data includes all information passed to NUF.S through the files plus such information as the current capital structure. This additional information is helpful when preparing the NUF.S user files. This is further described in Section III. It should be noted that the structure of the software package is very flexible. With minor modifications, any data from the tape can be aggregated to any level (state, region, etc.) and printed out to the line printer. In this sense, the package could be useful as a stand alone package to analyze existing data.

Figure 2 also shows the need for an input file referred to as the state code file. This file contains various codes which are used internally on the EIA tapes. In essence, this file tells the software which financial accounts to aggregate and also which utilities are in which region. The NUF.S user need not be concerned with this file. The file need only be changed when the user wishes different data to be printed out for a stand alone package as discussed above. For further information on these codes see: ENERGY INFORMATION ADMINISTRATION DOCUMENTATION FOR: Form 1, Form 2, Form 1M as of December 31, 1978.

Volume 3 contains examples of the state code files and also listings of NUF.S.FORM1.FORT and NUF.S.FORM1M.FORT.

FIGURE 3

FORM 1 FILE

1.	0.171165625E+04	GENERATION
2.	0.156269775E+04	SALES TO ULTIMATE
3.	0.280346222E+02	INTANGIBLE (EXISTING)
4.	0.585183672E+05	STEAM PRODUCTION
5.	0.160706445E+05	NUCLEAR PRODUCTION
6.	0.478598828E+04	HYDRO CONV
7.	0.0	PUMPED STORAGE
8.	0.407423218E+04	OTHER PRODUCTION
9.	0.284851719E+05	TRANSMISSION
10.	0.533410312E+05	DISTRIBUTION
11.	0.447314453E+04	GENERAL
12.	0.0	COMMON-ELEC
13.	0.788305625E+05	OUTSTANDING BONDS
14.	0.316991113E+04	SHORT TERM DEBT
15.	0.416431289E+05	COMMON STOCK
16.	0.190824141E+05	PREFERRED STOCK
17.	0.173060078E+05	RETAINED EARNINGS
18.	0.749843717E-01	EMBEDDED COST OF DEBT
19.	0.760591030E-01	EMBEDDED COST OF PREFERRED
20.	0.654272734E+05	ELECTRIC REVENUES
21.	0.823266016E+04	NET INCOME
22.	0.537580566E+03	WORKING CAPITAL
23.	0.470950781E+04	DEFERRED ITC
24.	0.893494922E+04	DEFERRED INCOME TAXES
25.	0.436610352E+05	FUEL ADJUSTED FOR TAXES
26.	0.801190734E-01	GENERAL TAX RATE

FIGURE 4

FORM 1M FILE

1.	0.409474365E+03	GENERATION
2.	0.279039307E+03	SALES TO ULTIMATE
3.	0.857306366E+02	INTANGIBLE (EXISTING)
4.	0.664283594E+04	STEAM PRODUCTION
5.	0.214003101E+04	NUCLEAR PRODUCTION
6.	0.103290078E+05	HYDRO CONV
7.	0.0	PUMPED STORAGE
8.	0.755344971E+03	OTHER PRODUCTION
9.	0.544111719E+04	TRANSMISSION
10.	0.516083594E+04	DISTRIBUTION
11.	0.467991016E+04	GENERAL
12.	0.0	COMMON-ELEC
13.	0.189958672E+05	OUTSTANDING BONDS
14.	0.104050117E+05	COMMON STOCK
15.	0.741890234E+04	RETAINED EARNINGS
16.	0.580053665E-01	COST OF EMBEDDED DEBT
17.	0.103718477E+05	ELECTRIC REVENUES
18.	0.120272949E+04	NET INCOME
19.	0.876409912E+03	WORKING CAPITAL
20.	0.757962500E+04	FUEL ADJUSTED FOR TAXES
21.	0.266359635E-01	GENERAL TAX RATE

III. PREPARATION OF MEFS INTERFACE SOLUTION FILES

To forecast the various financial statements and parameters, the single most important input to NUFSS are the MEFS interface solution files. The data contained in these files include MEFS forecasts of electricity generation capacity expansion plans, capacity costs, fuel and operation and maintenance costs, and generation. To a great extent, these data drive the financial forecasts of NUFSS. For each different run of MEFS, the value of these forecast are likely to be different. So for each MEFS run which is to be analyzed using NUFSS, these interface files will need to be created. Thus, the user of NUFSS should be familiar with the necessary steps to create these files. The flow of data for these files is shown in Figure 5.

MEFS is a collection of models designed to forecast and balance supply, conversion, and demand forecasts by computing equilibrium quantities and prices. The spectrum of MEFS includes the coal, oil, gas, synthetics, and electric utility energy markets. MEFS currently solves for the years 1985, 1990 and 1995. The following instructions assumes that a complete MEFS Solution (for 1985, 90, 95) has been generated and that the user has access to the packed matrices of the solution. This will be a set of three files (one for each year solved). Under current MEFS naming conventions these files might be called PCKMAT.A3TB111M, PCKMAT.A3TC111M, and PCKMAT.A3TD111M. These files contain the full MEFS solution, of which the electric utility sector is only a part. The first major step is to run NUFSS.PERUSE. This interactive program strips the electric utility section from the MEFS packed matrix and stores it into a file. With this done, the second step is to run NUFSS.MEFS.RUN. This program reads the file created in Step 1 and creates files which can be used directly by NUFSS. This program has two major purposes. First, the solution is aggregated to the categories which NUFSS can use. Secondly, MEFS solves only for 1985, 1990, and 1995, while NUFSS needs solutions for each year of the forecast period. The program allocates the MEFS results to year by year forecasts.

A detailed explanation of the two steps now follows.

Step 1

(a) Allocate space for a partitioned data set (PDS) entitled NUFSS.#####.PRE (##### = the MEFS run code, e.g. A3T111M). This can be done by running NUFSS.ALLOCATE as a batch job (see figure 6). Of course, the correct PDS name must be entered into NUFSS.ALLOCATE before running (see underline in figure 6).

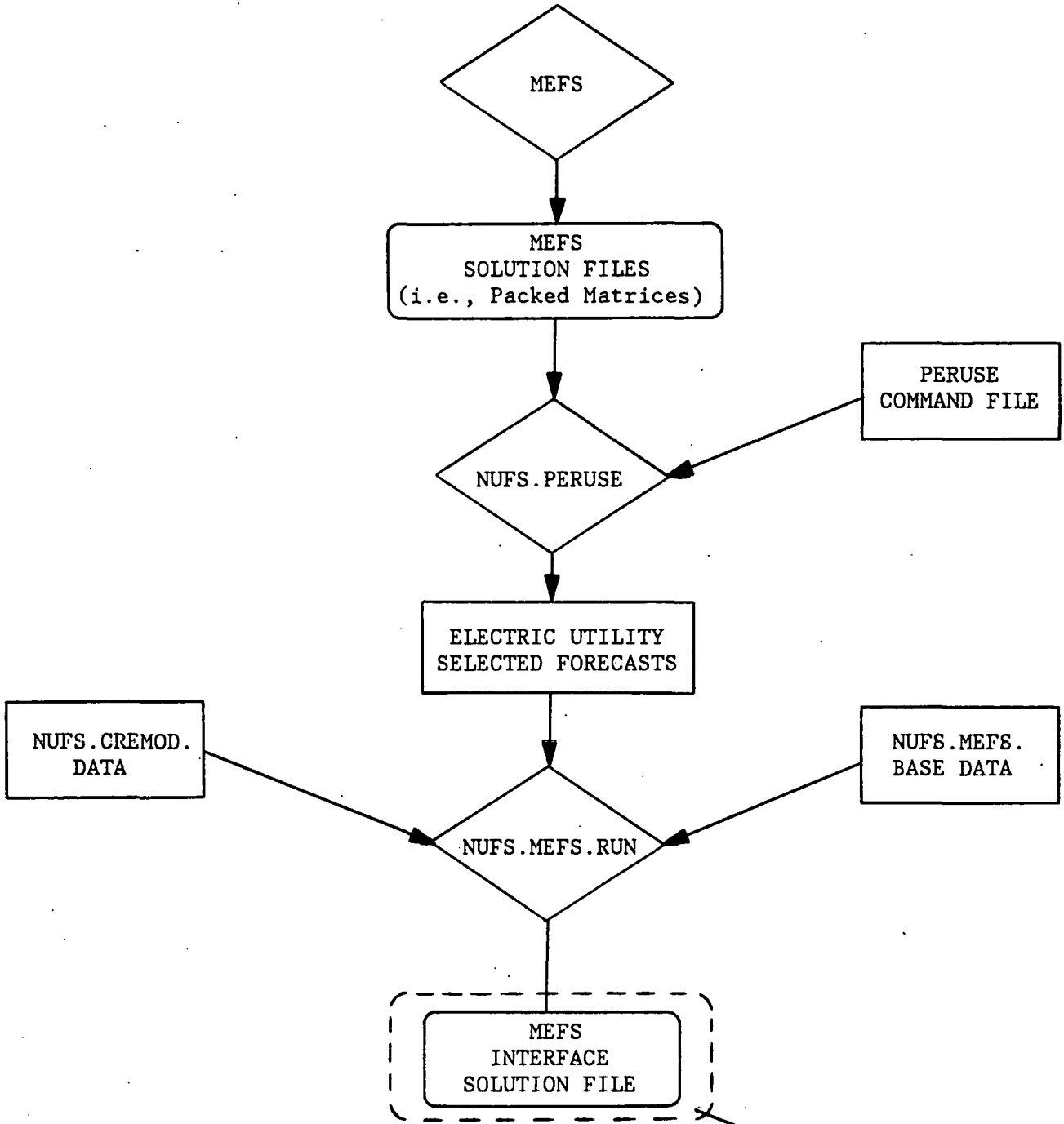
(b) Sign on to Time Sharing Option (TSO). When entering password enter:

\$\$\$ SIZE(1200) (\$\$\$ = password).

Without this size declaration, software will not run.

FIGURE 5

DATA FLOW FOR MEFS INTERFACE
SOLUTION FILES



See Figure 1

FIGURE 6

NUFS.ALLOCATE

1. //MI2UALOC JOB (6376,DO2), 'ALLOCATE', TIME=(0,5)
2. //DELD EXEC PGM=IEFBRL4, REGION=10K
3. //DDL DD DSN=CN6376.MW1.NUFS.BAULLM.PRE, DISP=(NEW,CATLG),
4. // UNIT=DASD,
5. // SPACE=(TRK,(35,2,2)), DCB=(DSORG=PO, RECFM=FB, BLKSIZE=6160, LRECL=80)

(c) Execute NUFS.PERUSE three times. It is executed once for each MEFS packed matrix. User must respond to various queries. These are relatively straightforward after one has studied a sample session as shown in Figure 7. The file requested for input queries should always be entered as NUFS.PERUSE.INPUT. This is the data set referred to as the Peruse Command file shown in Figure 5. The file for output should be the PDS allocated in Step 1a. Member names vary according to the run being 'perused':

B = 1985 = YEAR1
C = 1990 = YEAR2
D = 1995 = YEAR3

Only one file should be 'perused' at a time.

Step 2

NUFS.MEFS.RUN (see figure 8) is a file containing the JCL necessary to execute NUFS.MEFS.LOAD. (NUFS.MEFS.LOAD is a load module. The source program is contained in NUFS.MEFS.FORT. To create the load module, submit NUFS.MEFS.FORT as a batch job. It contains all necessary JCL to create NUFS.MEFS.LOAD.) The user need only to supply the file names in the JCL and submit it as a batch job. The file names which need to be supplied are underlined in figure 8. The input files are the members of the PDS created from Step 1. The file names should be assigned to files FT25-FT27 in chronological order. In addition, as shown in Figures 5 & 8, two more input files are necessary to run NUFS.MEFS.RUN. These files are NUFS.MEFS.BASEDATA and NUFS.CREMOD.DATA. These files, while necessary, are not central to this process. Discussion of these files may be found in appendix B of Volume III. The output files are the files to be read by NUFS. These files should be put in a PDS called NUFS.\$\$\$\$\$\$.POST. There will again be 11 members (ten DOE regions plus nation). The naming conventions for members is the same as that described in Section II.

FIGURE 7

SAMPLE NUF.S.PERUSE TSO SESSION

```
1. EXEC NUF.S.PERUSE
2. 11/21/80 13:37:30
3. ....WELCOME TO THE WONDERFUL WORLD OF PERUSAL.....
4. INPUT THE DESIRED RUN NAME? >BB7B111M
5. FILE FOR INPUT QUERIES(CR DEFAULTS TO THE TERMINAL)? >NUF.S.BB7111M.PRE(YEAR1)
6. OUTPUT WILL BE WRITTEN TO CN6376.MI2.NUF.S.BB7111M.PRE(YEAR1)
7. ANY ADDITIONAL FILES TO BE "PERUSED"? Y OR N >N
8. SEE OUTPUT IN FILE CN6376.MI2.NUF.S.BB7111M.PRE(YEAR1)
9. EXEC NUF.S.PERUSE
10. 11/21/80 13:41:21
11. ....WELCOME TO THE WONDERFUL WORLD OF PERUSAL.....
12. INPUT THE DESIRED RUN NAME? >BB7B111M
13. FILE FOR INPUT QUERIES(CR DEFAULTS TO THE TERMINAL)? >NUF.S.BB7111M.PRE(YEAR2)
14. OUTPUT WILL BE WRITTEN TO CN6376.MI2.NUF.S.BB7111M.PRE(YEAR2)
15. ANY ADDITIONAL FILES TO BE "PERUSED"? Y OR N >N
16. SEE OUTPUT IN FILE CN6376.MI2.NUF.S.BB7111M.PRE(YEAR2)
17. EXEC NUF.S.PERUSE
18. 11/21/80 13:45:46
19. ....WELCOME TO THE WONDERFUL WORLD OF PERUSAL.....
20. INPUT THE DESIRED RUN NAME? >BB7B111M
21. FILE FOR INPUT QUERIES(CR DEFAULTS TO THE TERMINAL)? >NUF.S.BB7111M.PRE(YEAR3)
22. OUTPUT WILL BE WRITTEN TO CN6376.MI2.NUF.S.BB7111M.PRE(YEAR3)
23. ANY ADDITIONAL FILES TO BE "PERUSED"? Y OR N >N
24. SEE OUTPUT IN FILE CN6376.MI2.NUF.S.BB7111M.PRE(YEAR3)
```

FIGURE 8

NUFS.MEFS.RUN

```
1. //MI2UREPT JOB (6376,002,,50),'NUFS-MEFS',TIME=(0,21)
2. //GO EXEC PGM=LARGE,REGION=500K
   //STEPLIB DD DSN=CN6376.MI2.NUFS.MEFS.LOAD,DISP=SHR
3. //GO.FT06F001 DD SYSOUT=A
5. //GO.FT16F001 DD DISP=SHR,DSN=CN6376.MI2.NUFS.MEFS.BASEDATA
   //GO.FT20F001 DD DSN=CN6376.MI2.NUFS.MEFS.LOAD,DISP=SHR,SPACE=(TRK,(10,1)),UNIT=SYSDA,
   // DISP=(NEW,DELETE),DCB=(DSORG=PS,RECFM=FB,LRECL=80,BLKSIZE=6160)
8. //GO.FT25F001 DD DISP=SHR,DSN=CN6376.MI2.NUFS.BB7111M.PRE(YEAR1)
   //GO.FT26F001 DD DISP=SHR,DSN=CN6376.MI2.NUFS.BB7111M.PRE(YEAR2)
   //GO.FT27F001 DD DISP=SHR,DSN=CN6376.MI2.NUFS.BB7111M.PRE(YEAR3)
11. //GO.FT30F001 DD DSN=CN6376.MI2.NUFS.BB7111M.PRE(YEAR3),
12. // UNIT=SYSDA,SPACE=(TRK,(1,1)),
   // DCB=(DSORG=PS,RECFM=FB,LRECL=80,BLKSIZE=6160)
14. //GO.FT31F001 DD DSN=CN6376.MI2.NUFS.BB7111M.PRE(YEAR2),
15. // UNIT=SYSDA,SPACE=(TRK,(1,1)),
   // DCB=(DSORG=PS,RECFM=FB,LRECL=80,BLKSIZE=6160)
   //GO.FT32F001 DD DSN=CN6376.MI2.NUFS.BB7111M.PRE(YEAR1),
18. // UNIT=SYSDA,SPACE=(TRK,(1,1)),
   // DCB=(DSORG=PS,RECFM=FB,LRECL=80,BLKSIZE=6160)
   //GO.FT33F001 DD DSN=CN6376.MI2.NUFS.BB7111M.PRE(YEAR1),
21. // UNIT=SYSDA,SPACE=(TRK,(1,1)),
   // DCB=(DSORG=PS,RECFM=FB,LRECL=80,BLKSIZE=6160)
22. //GO.FT34F001 DD DSN=CN6376.MI2.NUFS.BB7111M.PRE(YEAR1),
24. // UNIT=SYSDA,SPACE=(TRK,(1,1)),
   // DCB=(DSORG=PS,RECFM=FB,LRECL=80,BLKSIZE=6160)
25. //GO.FT35F001 DD DSN=CN6376.MI2.NUFS.BB7111M.PRE(YEAR1),
   // UNIT=SYSDA,SPACE=(TRK,(1,1)),
   // DCB=(DSORG=PS,RECFM=FB,LRECL=80,BLKSIZE=6160)
28. //GO.FT36F001 DD DSN=CN6376.MI2.NUFS.BB7111M.PRE(YEAR1),
   // UNIT=SYSDA,SPACE=(TRK,(1,1)),
   // DCB=(DSORG=PS,RECFM=FB,LRECL=80,BLKSIZE=6160)
31. //GO.FT37F001 DD DSN=CN6376.MI2.NUFS.BB7111M.PRE(YEAR1),
32. // UNIT=SYSDA,SPACE=(TRK,(1,1)),
   // DCB=(DSORG=PS,RECFM=FB,LRECL=80,BLKSIZE=6160)
34. //GO.FT38F001 DD DSN=CN6376.MI2.NUFS.BB7111M.PRE(YEAR1),
35. // UNIT=SYSDA,SPACE=(TRK,(1,1)),
   // DCB=(DSORG=PS,RECFM=FB,LRECL=80,BLKSIZE=6160)
38. //GO.FT39F001 DD DSN=CN6376.MI2.NUFS.BB7111M.PRE(YEAR1),
   // UNIT=SYSDA,SPACE=(TRK,(1,1)),
   // DCB=(DSORG=PS,RECFM=FB,LRECL=80,BLKSIZE=6160)
41. //GO.FT40F001 DD DSN=CN6376.MI2.NUFS.BB7111M.PRE(YEAR1),
42. // UNIT=SYSDA,SPACE=(TRK,(1,1)),
   // DCB=(DSORG=PS,RECFM=FB,LRECL=80,BLKSIZE=6160)
43.1 //GO.FT50F001 DD SYSOUT=A
43.2 //GO.FT60F001 DD SYSOUT=A
3 //GO.FT65F001 DD SYSOUT=A
4 //GO.FT98F001 DD SYSOUT=A
43.5 //GO.FT99F001 DD DSN=CN6376.MI2.NUFS.CREMOD.DATA,DISP=SHR
   //DELD EXEC PGM=IEFBR14,REGION=10K
   //DD1 DD DSN=CN6376.MI2.NUFS.BB7111M.POST,DISP=(MOD,DELETE),
46. // UNIT=DASD,SPACE=(TRK,(10,2,2))
   //DELD EXEC PGM=IEFBR14,REGION=10K
   //DD1 DD DSN=CN6376.MI2.NUFS.BB7111M.POST,DISP=(NEW,CATLG),
47. // UNIT=DASD,
50. // SPACE=(TRK,(10,2,2)),DCB=(DSORG=PO,RECFM=FB,BLKSIZE=6160,LRECL=80)
```

FIGURE 8
(Continued)

NUFS.MEFS.RUN

```
51. //GEN01 EXEC PGM=IEBGENER
    //SYSPRINT DD SYSOUT=A
    //SYSUT1 DD DISP=(OLD,DELETE),DSN=*&TEMPU1
54. //SYSUT2 DD DISP=(OLD,KEEP),DSN=CN6376.MI2.NUFS.BB7111M.POST(U1)
    //SYSIN DD DUMMY
    //GEN02 EXEC PGM=IEBGENER
57. //SYSPRINT DD SYSOUT=A
    //SYSUT1 DD DISP=(OLD,DELETE),DSN=*&TEMPU2
    //SYSUT2 DD DISP=(OLD,KEEP),DSN=CN6376.MI2.NUFS.BB7111M.POST(U2)
60. //SYSIN DD DUMMY
61. //GEN03 EXEC PGM=IEBGENER
    //SYSPRINT DD SYSOUT=A
    //SYSUT1 DD DISP=(OLD,DELETE),DSN=*&TEMPU3
64. //SYSUT2 DD DISP=(OLD,KEEP),DSN=CN6376.MI2.NUFS.BB7111M.POST(U3)
    //SYSIN DD DUMMY
    //GEN04 EXEC PGM=IEBGENER
67. //SYSPRINT DD SYSOUT=A
    //SYSUT1 DD DISP=(OLD,DELETE),DSN=*&TEMPU4
    //SYSUT2 DD DISP=(OLD,KEEP),DSN=CN6376.MI2.NUFS.BB7111M.POST(U4)
70. //SYSIN DD DUMMY
71. //GEN05 EXEC PGM=IEBGENER
    //SYSPRINT DD SYSOUT=A
    //SYSUT1 DD DISP=(OLD,DELETE),DSN=*&TEMPU5
74. //SYSUT2 DD DISP=(OLD,KEEP),DSN=CN6376.MI2.NUFS.BB7111M.POST(U5)
    //SYSIN DD DUMMY
    //GEN06 EXEC PGM=IEBGENER
77. //SYSPRINT DD SYSOUT=A
    //SYSUT1 DD DISP=(OLD,DELETE),DSN=*&TEMPU6
    //SYSUT2 DD DISP=(OLD,KEEP),DSN=CN6376.MI2.NUFS.BB7111M.POST(U6)
80. //SYSIN DD DUMMY
81. //GEN07 EXEC PGM=IEBGENER
    //SYSPRINT DD SYSOUT=A
    //SYSUT1 DD DISP=(OLD,DELETE),DSN=*&TEMPU7
84. //SYSUT2 DD DISP=(OLD,KEEP),DSN=CN6376.MI2.NUFS.BB7111M.POST(U7)
    //SYSIN DD DUMMY
    //GEN08 EXEC PGM=IEBGENER
87. //SYSPRINT DD SYSOUT=A
    //SYSUT1 DD DISP=(OLD,DELETE),DSN=*&TEMPU8
    //SYSUT2 DD DISP=(OLD,KEEP),DSN=CN6376.MI2.NUFS.BB7111M.POST(U8)
90. //SYSIN DD DUMMY
91. //GEN09 EXEC PGM=IEBGENER
    //SYSPRINT DD SYSOUT=A
    //SYSUT1 DD DISP=(OLD,DELETE),DSN=*&TEMPU9
94. //SYSUT2 DD DISP=(OLD,KEEP),DSN=CN6376.MI2.NUFS.BB7111M.POST(U9)
    //SYSIN DD DUMMY
    //GEN10 EXEC PGM=IEBGENER
97. //SYSPRINT DD SYSOUT=A
    //SYSUT1 DD DISP=(OLD,DELETE),DSN=*&TEMPUA
    //SYSUT2 DD DISP=(OLD,KEEP),DSN=CN6376.MI2.NUFS.BB7111M.POST(UA)
100. //SYSIN DD DUMMY
101. //GEN11 EXEC PGM=IEBGENER
    //SYSPRINT DD SYSOUT=A
    //SYSUT1 DD DISP=(OLD,DELETE),DSN=*&TEMPUT
104. //SYSUT2 DD DISP=(OLD,KEEP),DSN=CN6376.MI2.NUFS.BB7111M.POST(UT)
```

Interface File

A sample of the interface file created by this process is shown in figure 9. For discussion, the file may be split into four sections as shown. The first section is the capacity expansion plan. Each row represents a plant build and contains four entries which are described below.

1) The first entry is an integer code which indicates what year the build is to come on line.^{1/}

2) The second entry is an integer code which indicates what type of plant the build is. The codes are as follows:

<u>Code</u>	<u>Description</u>
1 =	Gas Steam
2 =	Oil Steam
3 =	Coal Type 1
4 =	Coal Type 2 (Different from Coal Type 1 because of construction profile)
5 =	Pumped Storage
6 =	Hydro
7 =	Nuclear
8 =	Combined Cycle
9 =	Turbine
10 =	Retrofits with 3 year construction schedule (CREMOD)
11 =	Conversions and Retrofits with 1 year construction schedule
12 =	Other Technologies (Solar, Geothermal, Etc.)
13 =	Transmission
14 =	Distribution
15 =	Other
16 =	Other

3) The third entry is the capacity of the build (MW).

4) The final entry is the cost of the build in base year dollars (\$/KW).

The second section of the file contains the forecasts of generation by year. There is one row for each of the years in the forecast period. For each year, two quantities are given. The first is total generation (GWH), followed by generation from nuclear powered plants (GWH).

The third section contains operating costs. Again, there is one row for each of the years in the forecast period. For each year, three quantities are given. The first entry is the average fuel cost (mills/kwh). Next is the cost of nuclear fuel (mills/kwh). Finally, the average operation and maintenance costs, excluding fuel, are given (mills/kwh). All costs are in base year dollars.

1/ (base year = 1, first forecast year =2, etc.)

FIGURE 9

MEFS INTERFACE FILE

1.	2	1	20.000	598.290
2.	2	2	1540.000	598.290
3.	2	3	1020.000	972.524
4.	3	3	610.000	972.524
5.	4	3	1120.000	972.524
6.	5	3	1420.000	972.524
7.	6	3	119.996	972.524
8.	7	3	110.000	972.524
9.	8	3	600.004	923.588
10.	9	3	600.000	923.588
11.	10	3	589.996	923.588
12.	11	3	600.000	923.588
13.	12	3	590.004	923.588
14.	2	4	960.000	830.833
15.	3	4	1370.000	830.833
16.	4	4	600.000	830.833
17.	5	4	2179.996	830.833
18.	8	4	680.000	758.122
19.	9	4	680.004	758.122
20.	10	4	679.996	758.122
21.	11	4	670.000	758.122
22.	12	4	680.004	758.122
23.	2	6	10.000	1019.165
24.	3	6	20.000	1019.165
25.	4	6	10.000	1019.165
26.	5	6	10.000	1019.165
27.	6	6	20.000	1019.165
28.	7	6	10.000	1019.165
29.	13	6	20.000	1019.165
30.	14	6	17.161	1019.165
31.	15	6	17.385	1019.165
32.	16	6	17.612	1019.165
33.	17	6	17.842	1019.165
34.	18	6	18.495	1019.165
35.	19	6	18.750	1019.165
36.	20	6	19.008	1019.165
37.	21	6	19.269	1019.165
38.	22	6	19.533	1019.165
39.	23	6	19.803	1019.165
40.	24	6	20.074	1019.165
41.	25	6	20.351	1019.165
42.	26	6	20.631	1019.165
43.	27	6	20.914	1019.165
44.	4	7	1890.000	900.024
45.	6	7	3320.000	900.024
46.	7	7	2149.996	900.024
47.	8	7	3060.004	766.490
48.	9	7	1609.996	766.490
49.	10	7	1130.000	766.490
50.	11	7	1210.000	766.490
.
.
.

FIGURE 9
(Continued)

MEFS INTERFACE FILE				
106.	12	13	3942.854	88.060
107.	13	13	4125.793	88.060
108.	14	13	1572.781	88.060
109.	15	13	1599.047	88.060
110.	16	13	1625.755	88.060
111.	17	13	1652.850	88.060
112.	18	13	2173.373	88.060
113.	19	13	2203.360	88.060
114.	20	13	2233.648	88.060
115.	21	13	2264.389	88.060
116.	22	13	2295.431	88.060
117.	23	13	2327.075	88.060
118.	24	13	2359.021	88.060
119.	25	13	2391.569	88.060
120.	26	13	2424.419	88.060
121.	27	13	2457.721	88.060
122.	0	0	0.0	0.0
123.	477.484		83.368	
124.	486.708		87.362	
125.	496.111		91.433	
126.	505.695		95.583	
127.	515.464		99.813	
128.	525.422		104.124	
129.	535.572		108.519	
130.	550.531		116.958	
131.	565.907		125.979	
132.	581.713		135.604	
133.	597.961		145.853	
134.	614.662		156.748	
135.	623.117		159.072	
136.	631.688		161.371	
137.	640.377		163.642	
138.	649.186		165.886	
139.	658.115		168.100	
140.	16.898		6.424	1.451
141.	16.898		6.424	1.451
142.	16.898		6.424	1.451
143.	16.898		6.424	1.451
144.	16.898		6.424	1.451
145.	16.898		6.424	1.451
146.	16.898		6.424	1.451
147.	17.176		6.636	1.532
148.	17.458		6.855	1.617
149.	17.745		7.081	1.706
150.	18.037		7.314	1.801
151.	18.334		7.556	1.901
152.	18.985		7.639	1.928
153.	19.659		7.723	1.955
154.	20.357		7.808	1.983
155.	21.080		7.894	2.012
156.	21.829		7.982	2.040
157.	0.0941	0.0920	0.0367	

The final section is one line with three values in it. These values are the loss factors (from transmission and distribution) for each of the years 1985, 1990, and 1995.

Volume 3 contains a listing of NUF.S.MEFS.FORT. In addition, copies of NUF.S.CREMOD.DATA and NUF.S.MEFS.BASEDATA are given and the creation of these files are discussed.

IV. PREPARATION OF USER SUPPLIED INPUT FILES

The overall purpose of the user files is to specify the existing regulatory climate and how this climate is to vary over time. These files contain inputs which describe such areas as:

- treatment of CWIP
- treatment of tax deferrals
- timing of construction expenditures
- costs of capital
- regulatory lag
- capital structure
- asset book and tax lives.

Much of this information is input for each year of the forecast period. Different regulatory scenarios can be created and analyzed by varying the information entered in these files. This capability provides a tool to directly analyze the effects of different regulatory treatments on various financial parameters.

This information is likely to vary significantly between publicly and privately owned utilities. For this reason, each region requires a separate user file for each of these ownership categories. It should be noted that one good source for some of this information is the output of the Form 1/Form 1M software (see section II).

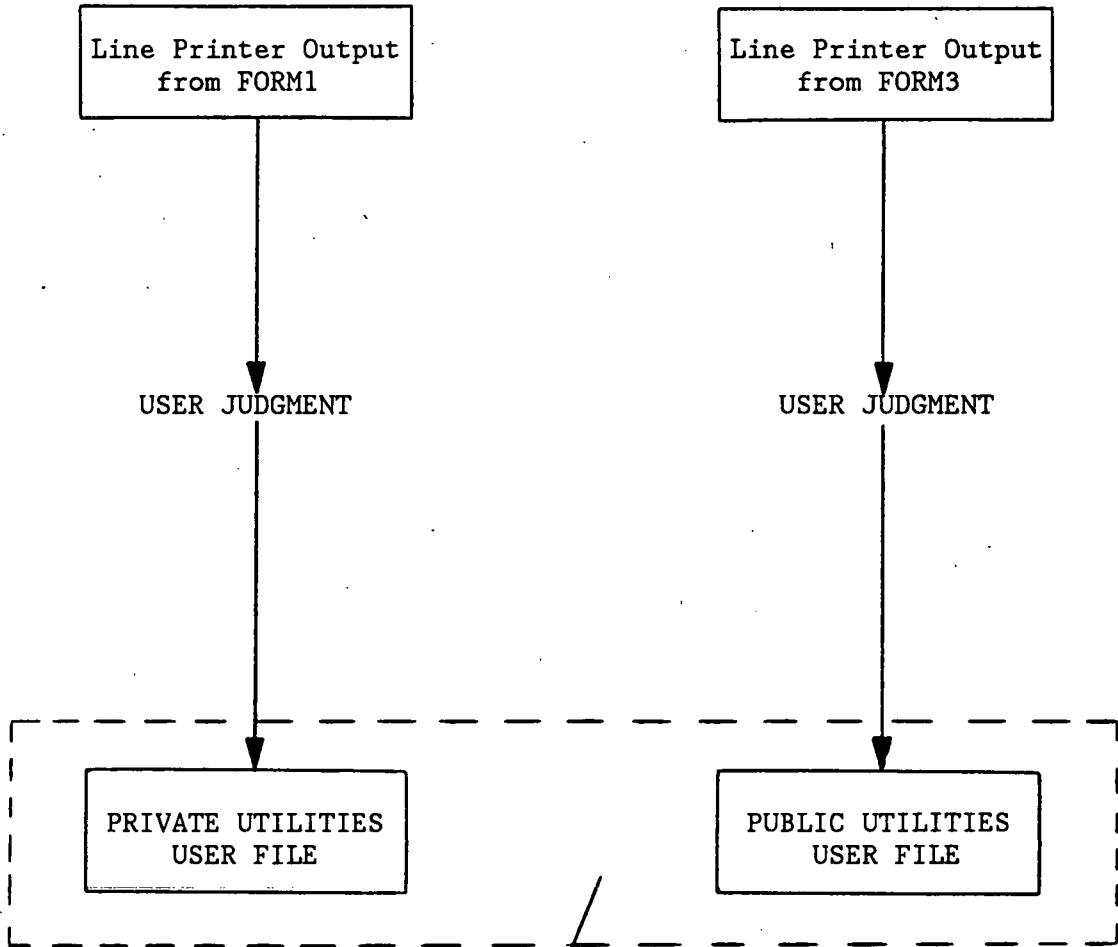
Initial user files have been prepared and are contained in two partitioned data sets. These files were prepared under the assumption that the regulatory climate will stay constant over time. It is foreseen that the user will develop additional sets of data files reflecting other regulatory conditions (e.g., all CWIP in rate base, higher financing capital costs, etc.). The data sets are entitled NUF.S.PRIVATE and NUF.S.PUBLIC. The naming convention for members of the data set is identical to that described in section one of this volume. A handy feature of the user files is that they may contain comments which describe the data input. Any line which contains an asterisk in column one is considered a comment and ignored when the files are read in. Figure 10 shows the flow of data for the creation of user input files.

Sample user files are shown in Figure 11 (private) and Figure 12 (public). With the exception of the inputs referred to as options, the files are self documenting. The key to the options input in the user files is as follows:

<u>Option</u>	<u>Description</u>
OPTION 1	= 1 calculate revenue requirements using year end rate base
	2 calculate revenue requirements using average year rate base

FIGURE 10

DATA FLOW FOR USER FILES



See Figure 1

FIGURE 11

PRIVATE USER FILE

```
1. *****
2. *FINANCIAL MODEL INPUTS FOR PRIVATE UTILITIES, DOE REGION 10
3. *****
4. *TITLES (2 LINES)
5. *****
6. DOE REGION 10
7. PRIVATE SECTOR
8. *****
9. *8 VALUES: (1) OPTION 1; (2) OPTION 2; (3) OPTION 3; (4) OPTION 4;
10. *(5) OPTION 5; (6) OPTION 6; (7) DISCOUNT RATE ; (8) BASE YEAR.
11. *****
12. 2 2 2 1 1 2 .125 1979
13. *****
14. *5 VALUES: (1) % OF CWIP IN RATE BASE ; (2) AFUDC OFFSET-1=YES, 0=NO;
15. *(3) AFUDC RATE; (4) % FLOW THROUGH OF ADR & ITC; (5) % FLOW THRU OF DEBT
16. *PORTION OF AFUDC.
17. *****
18. .000 1.0 .0749 .45 1.0
19. *****
20. *5 VALUES: (1) FEDERAL TAX RATE; (2) STATE TAX RATE;
21. *(3) PROPERTY TAX RATE; (4) SALES TAX RATE; (5) INVESTMENT TAX CREDIT;
22. *****
23. .46 .00 .000 .00 .10
24. *****
25. * 2 VALUES: (1) PRICE OF COMMON STOCK; (2) # OF SHARES (IN MILLIONS)
26. *****
27. 20.01 109.3
28. *****
29. *COMMON DIVIDEND PAYOUT RATIO FOR EACH FORECAST YEAR
30. *****
31. 50*.7465
32. *****
33. *CAPITAL STRUCTURE RATIOS (4 LINES)
34. *% LONG TERM DEBT FOR EACH FORECAST YEAR
35. *****
36. 50*.5088
37. *****
38. *% SHORT TERM DEBT FOR EACH FORECAST YEAR
39. *****
40. 50*.0296
41. *****
42. *% COMMON EQUITY FOR EACH FORECAST YEAR
43. *****
44. 50*.3644
45. *****
46. *% PREFERRED STOCK FOR EACH FORECAST YEAR
47. *****
48. 50*.0972
49. *****
50. *RETURN ON NEW BONDS FOR EACH FORECAST YEAR
51. *****
52. 50*.1109
53. *****
54. *RETURN ON SHORT TERM DEBT FOR EACH FORECAST YEAR
55. *****
```

FIGURE 11
(Continued)

PRIVATE USER FILE

56. 50*.1109
57. *****
58. *RETURN ON COMMON EQUITY FOR EACH FORECAST YEAR
59. *****
60. 50*.1486
61. *****
62. *RETURN ON PREFERRED STOCK FOR EACH FORECAST YEAR
63. *****
64. 50*.1162
65. *****
66. *GENERAL INFLATION RATE FOR EACH FORECAST YEAR
67. *****
68. 0.0 49*.0785
69. *****
70. *5 VALUES REFLECTING EACH OLD ASSET TYPE (1 LINE FOR EACH TYPE = 10 LINES):
71. *(1) DEPRECIATION RATE; (2) YRS. OF SERVICE; (3) BOOK LIFE; (4) TAX LIFE;
72. *(5) SALVAGE %.
73. *****
74. .03333 9 30 23 0.0
75. .03333 9 30 23 0.0
76. .03333 9 30 16 0.0
77. .03333 9 30 23 0.0
78. .03333 9 30 23 0.0
79. .03333 9 30 23 0.0
80. .03333 9 30 23 0.0
81. .03333 9 30 23 0.0
82. .03333 9 30 23 0.0
83. .03333 9 30 23 0.0
84. *****
85. *5 VALUES REFLECTING EACH NEW ASSET TYPE (1 LINE FOR EACH TYPE = 16 LINES):
86. *(1) BOOK LIFE; (2) TAX LIFE; (3) DEPRECIATION RATE; (4) DECLINING BALANCE
87. *DEPRECIATION FACTOR; (5) SALVAGE %.
88. *****
89. 30.0 23.0 .0333 2.0 0.0
90. 30.0 23.0 .0333 2.0 0.0
91. 30.0 23.0 .0333 2.0 0.0
92. 30.0 23.0 .0333 2.0 0.0
93. 30.0 23.0 .0333 2.0 0.0
94. 30.0 23.0 .0333 2.0 0.0
95. 30.0 16.0 .0333 2.0 0.0
96. 30.0 23.0 .0333 2.0 0.0
97. 30.0 23.0 .0333 2.0 0.0
98. 30.0 23.0 .0333 2.0 0.0
99. 30.0 23.0 .0333 2.0 0.0
100. 30.0 23.0 .0333 2.0 0.0
101. 30.0 23.0 .0333 2.0 0.0
102. 30.0 23.0 .0333 2.0 0.0
103. 30.0 23.0 .0333 2.0 0.0
104. 30.0 23.0 .0333 2.0 0.0

FIGURE 11
(Continued)

PRIVATE USER FILE

105. *****
106. *CONSTRUCTION PROFILE FOR EACH NEW ASSET (16 LINES OF 15 COLUMNS)
107. * IE., THE FRACTION OF ASSET COMPLETED IN EACH YEAR OF CONSTRUCTION
108. * (THE FRACTION IS CALCULATED USING CURRENT YEAR DOLLARS.)
109. * ENTRY 1 DENOTES YEAR PLANT COMES ON LINE
110. * ENTRY 2 DENOTES YEAR BEFORE PLANT COMES ON LINE, ETC.
111. *****

112.	.000	.021	.088	.255	.403	.188	.045	.000	.000	.000	.0	.0	.0	.0	.0
113.	.000	.021	.088	.255	.403	.188	.045	.000	.000	.000	.0	.0	.0	.0	.0
114.	.000	.012	.071	.209	.378	.244	.106	.000	.000	.000	.0	.0	.0	.0	.0
115.	.000	.021	.088	.255	.403	.188	.045	.000	.000	.000	.0	.0	.0	.0	.0
116.	.000	.180	.400	.300	.090	.030	.000	.000	.000	.000	.0	.0	.0	.0	.0
117.	.000	.180	.400	.300	.090	.030	.000	.000	.000	.000	.0	.0	.0	.0	.0
118.	.000	.033	.057	.162	.261	.284	.129	.034	.016	.011	.013	.0	.0	.0	.0
119.	.000	.226	.255	.107	.169	.152	.091	.000	.000	.000	.0	.0	.0	.0	.0
120.	.000	.750	.250	.000	.000	.000	.000	.000	.000	.000	.0	.0	.0	.0	.0
121.	.000	.333	.333	.334	.000	.000	.000	.000	.000	.000	.0	.0	.0	.0	.0
122.	.000	1.00	.000	.000	.000	.000	.000	.000	.000	.000	.0	.0	.0	.0	.0
123.	.000	.250	.750	.000	.000	.000	.000	.000	.000	.000	.0	.0	.0	.0	.0
124.	1.00	.000	.000	.000	.000	.000	.000	.000	.000	.000	.0	.0	.0	.0	.0
125.	1.00	.000	.000	.000	.000	.000	.000	.000	.000	.000	.0	.0	.0	.0	.0
126.	1.00	.000	.000	.000	.000	.000	.000	.000	.000	.000	.0	.0	.0	.0	.0
127.	1.00	.000	.000	.000	.000	.000	.000	.000	.000	.000	.0	.0	.0	.0	.0
128.	*****														

FIGURE 12

PUBLIC USER FILE

```
1. *****
2. *FINANCIAL MODEL INPUTS FOR PUBLIC UTILITIES, DOE REGION 10
3. *****
4. *TITLES (2 LINES)
5. *****
6. DOE REGION 10
7. PUBLIC SECTOR
8. *****
9. *8 VALUES: (1) OPTION 1; (2) OPTION 2; (3) OPTION 3; (4) OPTION 4;
10. *(5) OPTION 5; (6) OPTION 6; (7) DISCOUNT RATE ; (8) BASE YEAR.
11. *****
12. 2 2 2 1 1 2 .125 1979
13. *****
14. *5 VALUES: (1) % OF CWIP IN RATE BASE ; (2) AFUDC OFFSET-1=YES, 0=NO;
15. *(3) AFUDC RATE; (4) % FLOW THROUGH OF ADR & ITC; (5) % FLOW THRU OF DEBT
16. *PORTION OF AFUDC.
17. *****
18. .000 1.0 .0749 0.0 0.0
19. *****
20. *5 VALUES: (1) FEDERAL TAX RATE; (2) STATE TAX RATE;
21. *(3) PROPERTY TAX RATE; (4) SALES TAX RATE; (5) INVESTMENT TAX CREDIT;
22. *****
23. 0.0 0.0 0.0 0.0 0.0
24. *****
25. * 2 VALUES: (1) PRICE OF COMMON STOCK; (2) # OF SHARES (IN MILLIONS) IN BASE YR.
26. *****
27. 0.0 0
28. *****
29. *COMMON DIVIDEND PAYOUT RATIO FOR EACH FORECAST YEAR
30. *****
31. 50*.00
32. *****
33. *CAPITAL STRUCTURE RATIOS (4 LINES)
34. *% LONG TERM DEBT FOR EACH FORECAST YEAR
35. *****
36. 50*.2630
37. *****
38. *% SHORT TERM DEBT FOR EACH FORECAST YR.
39. *****
40. 50*.000
41. *****
42. *% COMMON EQUITY FOR EACH FORECAST YR.
43. *****
44. 50*.7370
45. *****
46. *% PREFERRED STOCK FOR EACH FORECAST YR.
47. *****
48. 50*.000
49. *****
50. *RETURN ON NEW BONDS FOR EACH FORECAST YR.
51. *****
52. 50*.1109
53. *****
```

FIGURE 12
(Continued)

PUBLIC USER FILE

54. *RETURN ON SHORT TERM DEBT FOR EACH FORECAST YR.
55. *****
56. 50*.1109
57. *****
58. *RETURN ON COMMON EQUITY FOR EACH FORECAST YR.
59. *****
60. 50*.1486
61. *****
62. *RETURN ON PREFERRED STOCK FOR EACH FORECAST YR.
63. *****
64. 50*.1162
65. *****
66. *GENERAL INFLATION RATE FOR EACH FORECAST YR.
67. *****
68. 0.0 49*.0785
69. *****
70. *5 VALUES REFLECTING EACH OLD ASSET TYPE (1 LINE FOR EACH TYPE = 10 LINES):
71. *(1) DEPRECIATION RATE; (2) YRS. OF SERVICE; (3) BOOK LIFE; (4) TAX LIFE;
72. *(5) SALVAGE %.
73. *****
74. .03333 9 30 23 0.0
75. .03333 9 30 23 0.0
76. .03333 9 30 16 0.0
77. .03333 9 30 23 0.0
78. .03333 9 30 23 0.0
79. .03333 9 30 23 0.0
80. .03333 9 30 23 0.0
81. .03333 9 30 23 0.0
82. .03333 9 30 23 0.0
83. .03333 9 30 23 0.0
84. *****
85. *5 VALUES REFLECTING EACH NEW ASSET TYPE (1 LINE FOR EACH TYPE = 16 LINES):
86. *(1) BOOK LIFE; (2) TAX LIFE; (3) DEPRECIATION RATE; (4) DECLINING BALANCE
87. *DEPRECIATION FACTOR; (5) SALVAGE %.
88. *****
89. 30.0 23.0 .0333 2.0 0.0
90. 30.0 23.0 .0333 2.0 0.0
91. 30.0 23.0 .0333 2.0 0.0
92. 30.0 23.0 .0333 2.0 0.0
93. 30.0 23.0 .0333 2.0 0.0
94. 30.0 23.0 .0333 2.0 0.0
95. 30.0 16.0 .0333 2.0 0.0
96. 30.0 23.0 .0333 2.0 0.0
97. 30.0 23.0 .0333 2.0 0.0
98. 30.0 23.0 .0333 2.0 0.0
99. 30.0 23.0 .0333 2.0 0.0
100. 30.0 23.0 .0333 2.0 0.0
101. 30.0 23.0 .0333 2.0 0.0
102. 30.0 23.0 .0333 2.0 0.0
103. 30.0 23.0 .0333 2.0 0.0
104. 30.0 23.0 .0333 2.0 0.0

- OPTION 2 = 1 plant specific CWIP and inflation data are input
2 all builds are assumed to have the same CWIP
accounting treatment (for MEFS analysis always input
2)
- OPTION 3 = 1 no regulatory lag
2 one year lag
3 1 1/2 years lag
4 2 years lag
- OPTION 4 = 1 sum-of-the-years tax depreciation
2 declining balance tax depreciation
- OPTION 5 = 1 hold capital structure as input (for MEFS analysis
always input 1)
2 do not allow long term debt, common or preferred
stock to decrease, increase working capital instead
- OPTION 6 = 1 one utility - link with ICF supply model
2 multi utilities - link with MEFS or the National
Coal Model (NCM)

The user files can be entered in free format. This is for user ease. It allows the user to use the repeat count operator '*'. For example, instead of entering fifty identical numbers on a line, the '*' may be used (see line 31 in Figure 11). This operator is a standard FORTRAN option when using free format input.

V. RUNNING NUFSS

NUFSS is run by submitting NUFSS.RUN as a batch job (see figure 13). NUFSS.RUN contains a set of JCL statements which execute the NUFSS load module. These instructions assume that the regional data files are created (see sections II-IV) and that the load module exists (see below). Before submitting NUFSS.RUN, the user must insert the correct file names and create the run file.

Two samples of the NUFSS.RUN are shown in Figures 14 and 15. Each run of NUFSS can forecast results for anywhere from a single region up to all 11 regions. Figure 14 shows the JCL to run three regions (in this case regions 2, 7 and 8). Figure 15 shows the JCL to run all 11 regions. Examining these two examples carefully shows how the files are entered for different types of runs.

The remainder of this section is divided into the following subsections: (a) the run file (FT09F001), (b) the report writers, (c) data file organization, and (d) creation of NUFSS load module.

a. Run File (FT09F001)

It is through inputs in the run file that the user controls the scope of the given run. This differs from the previously discussed files which contain data, and not control options. The file may be contained directly in the JCL statements. The first line is a title for the run. This is any string of 24 characters or less. This title appears on every page of the output. The second line contains 4 numbers which indicate the scope and nature of the particular run. The run file, similar to the larger user files, may contain comments. The four values input, in order, are: 1) the number of years to be forecast (example: 1979-95 = 17 years); 2) the number of regions to be forecast in the run; 3) Option 7; and 4) Option 8.

The options are defined as follows:

Option 7 - 1 Analyze privately owned utilities only

2 Analyze publicly owned utilities only

3 Analyze private and public; print private, public, and total industry financial statements separately

4 Analyze private and public; print only total industry statements

5 Print only short report (aggregates public and private)

Option 8 = 1 Standard MEFSS run analysis

2 Calculate fixed charge rate for 1 plant type

3 Calculate pricing coefficient for 1 plant type

4 Calculate revenue requirements for old money

FIGURE 13
RUNNING NUFS

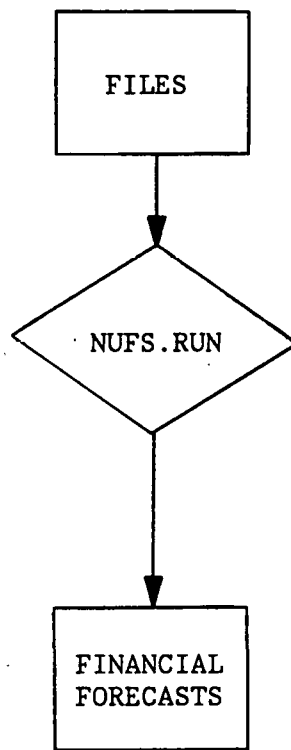


FIGURE 14

NUFS.RUN FOR 3 REGIONS

```
1. //MI2UPMG JOB (6376,D02,,99), 'BB7111M', TIME=(0,25)
2. //STEPRUN EXEC PGM=TEST, REGION=700K
3. //STEPLIB DD DSN=CN6376.MI2.NUFS.LOAD, DISP=SHR
4. //FT04F001 DD SYSOUT=A, DCB=(LRECL=133, RECFM=FBA)
4.1 //FT06F001 DD SYSOUT=A
4.2 //FT07F001 DD SYSOUT=A
4.3 //FT08F001 DD SYSOUT=A
5. //FT09F001 DD *
6. * TITLE OF RUN
7. NUFFS 3 REGION 7/15
8. * (1)NUMBER OF YRS:(2)NUMBER OF REGIONS:(3)OPTION 7:(4)OPTION 8
9. 17 3 3 1
10. //FT10F001 DD DSN=CN6376.MI2.NUFS.PRIVATE(U3), DISP=SHR
10.4 // DD DSN=CN6376.MI2.NUFS.PRIVATE(U4), DISP=SHR
10.5 // DD DSN=CN6376.MI2.NUFS.PRIVATE(U5), DISP=SHR
11. //FT11F001 DD DSN=CN6376.MI2.NUFS.PUBLIC(U3), DISP=SHR
11.4 // DD DSN=CN6376.MI2.NUFS.PUBLIC(U4), DISP=SHR
11.5 // DD DSN=CN6376.MI2.NUFS.PUBLIC(U5), DISP=SHR
12. //FT12F001 DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(U3), DISP=SHR
12.4 // DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(U4), DISP=SHR
12.5 // DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(U5), DISP=SHR
13. //FT13F001 DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(U3), DISP=SHR
13.4 // DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(U4), DISP=SHR
13.5 // DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(U5), DISP=SHR
14. //FT14F001 DD DSN=CN6376.MI2.NUFS.BB7111M.POST(U3), DISP=SHR
14.4 // DD DSN=CN6376.MI2.NUFS.BB7111M.POST(U4), DISP=SHR
14.5 // DD DSN=CN6376.MI2.NUFS.BB7111M.POST(U5), DISP=SHR
15. /**
```

FIGURE 15

NUFS.RUN FOR 11 REGIONS

```
1. //MI2UPMG JOB (6376,D02,,99),'BB7111M',TIME=(0,25)
2. //STEPRUN EXEC PGM=TEST,REGION=700K
3. //STEPLIB DD DSN=CN6376.MI2:NUFS.LOAD,DISP=SHR
4. //FT04F001 DD SYSOUT=A,DCB=(LRECL=133,RECFM=FBA)
4.1 //FT06F001 DD SYSOUT=A
4.2 //FT07F001 DD SYSOUT=A
4.3 //FT08F001 DD SYSOUT=A
5. //FT09F001 DD *
6. * TITLE OF RUN
7. NUFFS 11 REGION 7/15
8. * (1)NUMBER OF YRS;(2)NUMBER OF REGIONS;(3)OPTION 7;(4)OPTION 8
9. 17 11 3 1
10. //FT10F001 DD DSN=CN6376.MI2.NUFS.PRIVATE(UT),DISP=SHR
10.1 // DD DSN=CN6376.MI2.NUFS.PRIVATE(U1),DISP=SHR
10.2 // DD DSN=CN6376.MI2.NUFS.PRIVATE(U2),DISP=SHR
10.3 // DD DSN=CN6376.MI2.NUFS.PRIVATE(U3),DISP=SHR
10.4 // DD DSN=CN6376.MI2.NUFS.PRIVATE(U4),DISP=SHR
10.5 // DD DSN=CN6376.MI2.NUFS.PRIVATE(U5),DISP=SHR
10.6 // DD DSN=CN6376.MI2.NUFS.PRIVATE(U6),DISP=SHR
10.7 // DD DSN=CN6376.MI2.NUFS.PRIVATE(U7),DISP=SHR
10.8 // DD DSN=CN6376.MI2.NUFS.PRIVATE(U8),DISP=SHR
10.9 // DD DSN=CN6376.MI2.NUFS.PRIVATE(U9),DISP=SHR
10.91 // DD DSN=CN6376.MI2.NUFS.PRIVATE(UA),DISP=SHR
11. //FT11F001 DD DSN=CN6376.MI2.NUFS.PUBLIC(UT),DISP=SHR
11.1 // DD DSN=CN6376.MI2.NUFS.PUBLIC(U1),DISP=SHR
11.2 // DD DSN=CN6376.MI2.NUFS.PUBLIC(U2),DISP=SHR
11.3 // DD DSN=CN6376.MI2.NUFS.PUBLIC(U3),DISP=SHR
11.4 // DD DSN=CN6376.MI2.NUFS.PUBLIC(U4),DISP=SHR
11.5 // DD DSN=CN6376.MI2.NUFS.PUBLIC(U5),DISP=SHR
11.6 // DD DSN=CN6376.MI2.NUFS.PUBLIC(U6),DISP=SHR
11.7 // DD DSN=CN6376.MI2.NUFS.PUBLIC(U7),DISP=SHR
11.8 // DD DSN=CN6376.MI2.NUFS.PUBLIC(U8),DISP=SHR
11.9 // DD DSN=CN6376.MI2.NUFS.PUBLIC(U9),DISP=SHR
11.91 // DD DSN=CN6376.MI2.NUFS.PUBLIC(UA),DISP=SHR
12. //FT12F001 DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(UT),DISP=SHR
12.1 // DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(U1),DISP=SHR
12.2 // DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(U2),DISP=SHR
12.3 // DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(U3),DISP=SHR
12.4 // DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(U4),DISP=SHR
12.5 // DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(U5),DISP=SHR
12.6 // DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(U6),DISP=SHR
12.7 // DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(U7),DISP=SHR
12.8 // DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(U8),DISP=SHR
12.9 // DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(U9),DISP=SHR
12.91 // DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(UA),DISP=SHR
13. //FT13F001 DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(UT),DISP=SHR
13.1 // DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(U1),DISP=SHR
13.2 // DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(U2),DISP=SHR
13.3 // DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(U3),DISP=SHR
13.4 // DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(U4),DISP=SHR
13.5 // DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(U5),DISP=SHR
13.6 // DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(U6),DISP=SHR
```

FIGURE 15
(Continued)

NUFS.RUN FOR 11 REGIONS

```
13.7 // DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(U7),DISP=SHR
13.8 // DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(U8),DISP=SHR
13.9 // DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(U9),DISP=SHR
13.91 // DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(UA),DISP=SHR
14. //FT14F001 DD DSN=CN6376.MI2.NUFS.BB7111M.POST(UT),DISP=SHR
14.1 // DD DSN=CN6376.MI2.NUFS.BB7111M.POST(U1),DISP=SHR
14.2 // DD DSN=CN6376.MI2.NUFS.BB7111M.POST(U2),DISP=SHR
14.3 // DD DSN=CN6376.MI2.NUFS.BB7111M.POST(U3),DISP=SHR
14.4 // DD DSN=CN6376.MI2.NUFS.BB7111M.POST(U4),DISP=SHR
14.5 // DD DSN=CN6376.MI2.NUFS.BB7111M.POST(U5),DISP=SHR
14.6 // DD DSN=CN6376.MI2.NUFS.BB7111M.POST(U6),DISP=SHR
14.7 // DD DSN=CN6376.MI2.NUFS.BB7111M.POST(U7),DISP=SHR
14.8 // DD DSN=CN6376.MI2.NUFS.BB7111M.POST(U8),DISP=SHR
14.9 // DD DSN=CN6376.MI2.NUFS.BB7111M.POST(U9),DISP=SHR
14.91 // DD DSN=CN6376.MI2.NUFS.BB7111M.POST(UA),DISP=SHR
15. //*
```

In an analysis of a MEFS run (OPTION 8 = 1), or an old money revenue requirements calculation (OPTION 8 = 4), the run file would be complete with the above four numbers. If fixed charge rates or pricing coefficients are to be calculated (OPTION 8 = 2 or 3) further inputs are necessary. To calculate a fixed charge rate for a build (Option 8 = 2), a third line containing two numbers is necessary. The two values to be entered, in order, are: 1) the year that the build is to come on line; and 2) the build plant type. These two numbers should be entered using the same integer codes discussed for these values in section II. To calculate pricing coefficients for a plant type (Option 8 = 3), a third line containing four numbers is necessary. The first of these entries is the integer code for the plant type. The next three numbers are the integer codes for the years which the pricing coefficients are to be calculated. Again, these numbers should be entering using the integer codes explained in Section III. Examples of JCL run streams for a one region run under each of the four values of Option 8 are given in figures 16a-16d.

b. The Report Writers

NUFS is set up to write four different reports for each run. Each of these reports is sent to a different unit number.

A summary of the important inputs is written to unit FT04F001. This includes regulatory parameters, the capacity expansion plan, and forecast generation. In addition, intermediate results of calculations from the NUFFS algorithms are sent to this unit. This information is very helpful when carefully examining or interpreting a given run.

The primary financial forecasts are written to unit FT06F001. This includes the financial statements and parameters. The level of detail printed in this unit is determined by the value of Option 7 in the run file. For example, when option 7=3, very detailed and voluminous output is printed. This output is created regardless of the value of Option 8. The analyst must be careful in interpretation of this information when Option 8 does not equal 1. For example, when calculating a fixed charge rate (Option 8 = 2), the income statement shows only the contribution of the given plant. Such information is very enlightening, but should be interpreted properly.

Unit FT07F001 is only created when Option 8 is not equal to 1. It contains summary information relating directly to the calculation of the fixed charge rates, pricing coefficients, or old money requirements.

A short report is always written to unit FT08F001. This report contains summary financial parameter forecasts from NUFFS. This file can be used to examine the financial feasibility of a given capacity expansion plan. It contains the forecasted values of: i) interest coverage, ii) AFUDC as a percentage of earnings, iii) actual return on equity, and iv) external financing as a percent of total applications. In addition, this file is used in the NUREG modeling process.

FIGURE 16-a

NUFS.RUN WITH OPTION 8 = 1

```
1. //MI2UPMG JOB (6376,D02,,99),'BB7111M',TIME=(0,25)
2. //STEPRUN EXEC PGM=TEST,REGION=700K
3. //STEPLIB DD DSN=CN6376.MI2.NUFS.LOAD,DISP=SHR
4. //FT04F001 DD SYSOUT=A,DCB=(LRECL=133,RECFM=FBA)
4.1 //FT06F001 DD SYSOUT=A
4.2 //FT07F001 DD SYSOUT=A
4.3 //FT08F001 DD SYSOUT=A
5. //FT09F001 DD *
6. * TITLE OF RUN
7. STANDARD ANALYSIS
8. * (1)NUMBER OF YRS;(2)NUMBER OF REGIONS;(3)OPTION 7;(4)OPTION 8
9. 17 1 3 1
10. //FT10F001 DD DSN=CN6376.MI2.NUFS.PRIVATE(U3),DISP=SHR
11. //FT11F001 DD DSN=CN6376.MI2.NUFS.PUBLIC(U3),DISP=SHR
12. //FT12F001 DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(U3),DISP=SHR
13. //FT13F001 DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(U3),DISP=SHR
14. //FT14F001 DD DSN=CN6376.MI2.NUFS.BB7111M.POST(U3),DISP=SHR
15. /**
```

FIGURE 16-b

NUFS.RUN WITH OPTION 8 = 2

```
1. //MI2UPMG JOB (6376,D02,,99),'BB7111M',TIME=(0,25)
2. //STEPRUN EXEC PGM=TEST,REGION=700K
3. //STEPLIB DD DSN=CN6376.MI2.NUFS.LOAD,DISP=SHR
4. //FT04F001 DD SYSOUT=A,DCB=(LRECL=133,RECFM=FBA)
4.1 //FT06F001 DD SYSOUT=A
4.2 //FT07F001 DD SYSOUT=A
4.3 //FT08F001 DD SYSOUT=A
5. //FT09F001 DD *
6. * TITLE OF RUN
7. FIXED CHARGE RATES
8. * (1)NUMBER OF YRS;(2)NUMBER OF REGIONS;(3)OPTION 7;(4)OPTION 8
9. 17 1 3 2
9.1 * (1)YEAR PLANT COMES ON LINE; (2)PLANT TYPE
9.2 8 7
10. //FT10F001 DD DSN=CN6376.MI2.NUFS.PRIVATE(U3),DISP=SHR
11. //FT11F001 DD DSN=CN6376.MI2.NUFS.PUBLIC(U3),DISP=SHR
12. //FT12F001 DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(U3),DISP=SHR
13. //FT13F001 DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(U3),DISP=SHR
14. //FT14F001 DD DSN=CN6376.MI2.NUFS.BB7111M.POST(U3),DISP=SHR
15. /**
```

FIGURE 16-c

NUFS.RUN WITH OPTION 8 = 3

```
1. //MI2UPMG JOB (6376,D02,,99),'BB7111M',TIME=(0,25)
2. //STEPRUN EXEC PGM=TEST,REGION=700K
3. //STEPLIB DD DSN=CN6376.MI2.NUFS.LOAD,DISP=SHR
4. //FT04F001 DD SYSOUT=A,DCB=(LRECL=133,RECFM=FBA)
4.1 //FT06F001 DD SYSOUT=A
4.2 //FT07F001 DD SYSOUT=A
4.3 //FT08F001 DD SYSOUT=A
5. //FT09F001 DD *
6. * TITLE OF RUN
7. PRICING COEFFICIENTS
8. * (1)NUMBER OF YRS;(2)NUMBER OF REGIONS;(3)OPTION 7;(4)OPTION 8
9. 17 1 3 3
9.1 * (1)PLANT TYPE; (2)-(4) INTEGER YEAR CODES FOR YEARS
9.2 7 7 12 17
10. //FT10F001 DD DSN=CN6376.MI2.NUFS.PRIVATE(U3),DISP=SHR
11. //FT11F001 DD DSN=CN6376.MI2.NUFS.PUBLIC(U3),DISP=SHR
12. //FT12F001 DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(U3),DISP=SHR
13. //FT13F001 DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(U3),DISP=SHR
14. //FT14F001 DD DSN=CN6376.MI2.NUFS.BB7111M.POST(U3),DISP=SHR
15. /**
```

FIGURE 16-d

NUFS.RUN WITH OPTION 8 = 4

```
1. //MI2UPMG JOB (6376,D02,,99),'BB7111M',TIME=(0,25)
2. //STEPRUN EXEC PGM=TEST,REGION=700K
3. //STEPLIB DD DSN=CN6376.MI2.NUFS.LOAD,DISP=SHR
4. //FT04F001 DD SYSOUT=A,DCB=(LRECL=133,RECFM=FBA)
4.1 //FT06F001 DD SYSOUT=A
4.2 //FT07F001 DD SYSOUT=A
4.3 //FT08F001 DD SYSOUT=A
5. //FT09F001 DD *
6. * TITLE OF RUN
7. OLD MONEY REQUIRE.
8. * (1)NUMBER OF YRS;(2)NUMBER OF REGIONS;(3)OPTION 7;(4)OPTION 8
9. 17 1 3 4
10. //FT10F001 DD DSN=CN6376.MI2.NUFS.PRIVATE(U3),DISP=SHR
11. //FT11F001 DD DSN=CN6376.MI2.NUFS.PUBLIC(U3),DISP=SHR
12. //FT12F001 DD DSN=CN6376.MI2.NUFS.FORM1.PDS78(U3),DISP=SHR
13. //FT13F001 DD DSN=CN6376.MI2.NUFS.FORM1M.PDS78(U3),DISP=SHR
14. //FT14F001 DD DSN=CN6376.MI2.NUFS.BB7111M.POST(U3),DISP=SHR
15. /**
```

c. Data File Organization

The input files for NUFFS are entered in five separate units as follows. Unit FT10F001 should contain the user file(s) for the private utilities. Unit FT11F001 should contain the user file(s) for the public utilities. Unit FT12F001 should contain the Form 1 file(s). Unit FT13F001 should contain the Form 1M file(s). Finally, unit FT14F001 should contain the MEFS interface files.

When running NUFFS for multiple regions, a given unit is to contain the relevant files concatenated as shown in the examples (Figures 14 and 15). The order in which the regions are concatenating is somewhat arbitrary but must be identical for all five units. This order will determine the order in which the outputs are printed.

d. Creation of Load Module

As mentioned previously, NUFFS.RUN is a set of JCL statements which execute a load module. The steps in creating the load module are shown in Figure 16. This rarely needs to be done. Barring accidents, this should only be done when: 1) a change has been made in the model code; or 2) the model is to be installed on a new computer system.

The code for NUFFS is stored in two FORTRAN source module files, NUFFS.FORT and NUFFS.RPT.FORT. These files also contain the JCL necessary for compilation and link editing and may be submitted as batch jobs. The jobs must be submitted in the order suggested by Figure 17. NUFFS.RPT.FORT is submitted first. This job will compile and link edit the FORTRAN code and produce a load module called NUFFS.RPT.LOAD. Next, NUFFS.FORT is to be submitted. The FORTRAN code is compiled and link edited together with NUFFS.RPT.LOAD to produce the needed load module NUFFS.LOAD.

FIGURE 17
CREATING NUFS LOAD

