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RODMOD—A Code for Control Rod Positioning

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ABSTRACT

This report documents a computer code which has been implemented to position control rods according to a prescribed schedule during the calculation of a reactor history. Control rods may be represented explicitly with or without internal black absorber conditions in selected energy groups, or fractional insertion may be done, or both, in a problem. There is provision for control rod follower, movement of materials through a series of zones in a closed loop, and shutdown rod insertion and subsequent removal to allow the reactor history calculation to be continued. This code is incorporated in the system containing the VENTURE diffusion theory neutronics and the BURNER exposure codes for routine use. The implemented automated procedures cause the prescribed control rod insertion schedule to be applied without the access of additional user input data during the calculation of a reactor operating history.

COMPUTER CODE ABSTRACT

1. Program Identification: Control Rod Positioning Code: RODMOD
2. Function: This code may be used to position control rods during the calculation of a reactor history. Provision has been made to treat control rod-follower explicitly, or to apply a fractional rod insertion. Control rods may be represented by the "black absorber" boundary condition. Full rod insertion may be treated, and shutdown rod insertion and then removal may be accounted for.
3. Method of Solution: Data processing.
4. Related Material: Standard interface data files adopted in the DOE Reactor Physics code coordination effort are used. User input data must be processed externally. Other modules using consistent formulations and interface data file specifications will couple directly with this one.
5. Restrictions: Variable dimensioning is used throughout. (This is not a stand-alone code; it must be implemented in a modular environment.)
6. Computer: This code has been run on IBM Model 360 computers.
7. Running Time: Trivial compared with that for solving neutronics problems.
8. Programming Languages: Most of the programming is in FORTRAN language. Known limitations of manufacturer's current compilers are not exceeded. Special routines programmed in IBM assembler language are used for certain functions, e.g., memory allocation.
9. Operating System: The basic OS-360 IBM operating system has been used under HASP and ASP with a FORTRAN IV, H level compiler version 21.8.
10. Machine Requirements: For use with the VENTURE modular code system, a 50,000 short word or larger memory is required in addition to auxiliary disk storage.
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I. INTRODUCTION

The RODMOD code was developed to serve the role of applying a prescribed schedule of rod positioning during the calculation of a nuclear reactor history. This code is a companion of the codes VENTURE¹, BURNER², and others in the local modular reactor computation system³. Primary interfacing of basic data is done in defined standard interface data files⁴. These codes use only data from these files without access of input data from the user input data stream.

This code satisfies the basic objectives of the inter-installation code coordination activity of the Reactor Physics Branch, DRRD, DOE. Conversion of the code to other computer types and used in similar modular systems with compatible data file management should not be difficult. The programming techniques known to cause difficulty in conversion have been avoided.

RODMOD is in routine use locally on a production basis and available at ORNL to other installations via remote terminals. This code required about five man months to implement.

II. APPLICATION INFORMATION

This section presents information about the code which is of special interest to the user. Included are three sample problems which demonstrate capability.

A. Program Description

A prescribed schedule of control rod positioning is applied during the calculation of a reactor history. Several options have been implemented to choose between the procedures. For example:

- 1) Positioning may involve withdrawal or insertion,
- 2) Full rod insertion or withdrawal may be specified using special data,
- 3) Special shutdown rods may be accounted for,
- 4) When the rods are not represented explicitly, fractional rod-follower specifications may be used,

- 5) Rods may be represented by internal black absorber boundary conditions,
- 6) Interchange of all nuclide concentrations in a set of zones may be done in a closed loop (not necessarily control rods),
- 7) The automated procedure implemented minimizes user input data requirements.

This code is a member of the local modular nuclear reactor computation system and does not read input data. Information is supplied via standard interface data files and results are written on standard interface data files.

B. Program Considerations

Figure 1 lists the contents of the record RODINS of the standard interface data file CONTRL (see section 204 of reference 1). Figure 2 lists the contents of the standard interface data file RODSET. Together they comprise the instructions to RODMOD and they may be created with the input processor⁴, or alternatively the record RODINS of the file CONTRL may be created with the special processor DUTLIN.

RODMOD is accessed by using the module number 12 as described in reference 3. At each access the standard interface data files NDXSRF (nuclide referencing), GEODST (geometry description), and ZNATDN (zone nuclide densities) are read in addition to RODSET and the record RODINS in file CONTRL. Using instructions in RODSET and the record RODINS, RODMOD modifies the densities of nuclides associated with the control rods and follower, and rewrites the nuclide density file ZNATDN. Another nuclide density file YNATDN is normally created for subsequent data recovery; this file is identical to the current latest version of ZNATDN, except for the name and version number, when written.

C. The Automated Procedure

What is meant here by the automated procedure is that a schedule of control rod positioning may be specified prior to a calculation and applied during the calculation without additional input instructions. That is, the RODMOD code is accessed when desired and takes actions according to instructions through the calculation of the reactor operating history. It may be necessary to supply additional code instructions, as to effect a new rod

FIGURE 1. CONTENTS OF THE 'RODINS' RECORD OF INTERFACE FILE 'CONTRL'.

```

C-----
CF          CONTROL ROD POSITIONING INSTRUCTIONS
C
CL      RODINS, (IX(I),I=1,100), (IX(I),I=1,100)
C
CW          (101*H.T+1(0)) = NUMBER OF WORDS.
C
CD      RODINS          ROD POSITIONING MODULE DATA IDENTIFIER (6HRODINS).
C
CC      NOTE - THE INTERFACE FILES 'CONTRL' 'RODSET' 'NDXSRP' 'ZNATDN'
CC      AND 'GEODST' ARE REQUIRED.
C
CD      IX(1)           REFERENCE HISTORY TIME (CYCLE TIME), DAYS, BETWEEN
CD                      FUELINGS DURING WHICH A SUCCESSION OF CONTROL ROD
CD                      POSITIONINGS ARE TO BE DONE (SEE IX(10)=0 BELOW) -
CD                      USED FOR THE FIRST NSRPS SET (IX(8)=1).
C
CD      IX(2)           REFERENCE HISTORY TIME TO BE USED FOR ALL BUT THE
CD                      FIRST NSRPS SET (IX(8).GT.1) - DEFAULTED TO IX(1)
CD                      IF 0.
C
CD      IX(3)           EDIT OPTIONS.
CD                      0- NO SPECIAL EDITS.
CD                      1- ROD-FOLLOWER ZONE DENSITIES AFTER POSITIONING.
CD                      2- PLUS SOME INFORMATION ABOUT ROD POSITIONING.
CD                      3- PLUS MORE INFORMATION ABOUT ROD POSITIONING.
CD                      4- PLUS CONTENTS OF THE COMMON DATA BLOCK.
CD                      5- PLUS THE CONTENTS OF FILES 'NDXSRP', 'ZNATDN',
CD                      AND THIS RECORD 'RODINS' OF FILE 'CONTRL'.
C
CD      IX(8)           THE SET NUMBER OF THE ROD POSITIONING SPECIFICATIONS
CD                      (OUT OF NSRPS SETS ON FILE 'RODSET') THAT IS TO BE
CD                      USED THIS ACCESS. DEFAULTED TO 1 IF 0. (APPLICABLE
CD                      FOR IX(10) =0, OR =L BELOW).
C
CD      IX(9)           ANOTHER SET NUMBER OF THE ROD POSITIONING
CD                      SPECIFICATIONS THAT IS TO BE USED THIS ACCESS
CD                      (IF.GT.0) AFTER USING THE IX(8) SET.
C
CD      IX(10)          OPTIONS ON ROD POSITIONING.
CD                      -4- RECOVER ALL ROD AND FOLLOWER CONCENTRATIONS
CD                      FROM THE NEXT-TO-LATEST VERSION OF THE ZONE
CD                      DENSITY FILE 'ZNATDN' (SEE IX(11) AND IX(12)
CD                      BELOW). IF NEXT-TO-LATEST VERSION DOES NOT
CD                      EXIST, USE LATEST VERSION.
CD                      -3- RECOVER ALL ROD AND FOLLOWER CONCENTRATIONS
CD                      FROM THE LATEST VERSION OF FILE 'ZNATDN'.
CD                      -2- INSERT RODS FULLY AS SPECIFIED BY OPTION NSE
CD                      IN THE FILE 'RODSET'.
CD                      -1- WITHDRAW RODS FULLY AS SPECIFIED BY OPTION NSE
CD                      IN THE FILE 'RODSET'.

```

(CONT)

0- AUTOMATED PROCEDURE.
 IF THE TIME $XX(1) \neq 0$ ----- THE REFERENCE
 TIME INTO THE CYCLE (TR) IS OBTAINED FROM THE
 DENSITY FILE 'ZNATDN'. THEN THE FRACTION OF
 EXPOSURE TIME IS $P=TR/XX(1)$. THE NEAREST
 $PER(L)$ (ON 'RODSET' FILE) TO P IS FOUND, AND
 THE CORRESPONDING L IS THEN THE POINT IN THE
 HISTORY FOR POD POSITIONING. IE., THE
 SPECIFICATIONS $NZI(J,L)$ (ON 'RODSET' FILE)
 ARE USED TO POSITION THE RODS. NOTE THAT WITH
 THIS OPTION, IT IS POSSIBLE THAT SOME POINTS
 IN THE HISTORY MAY BE SKIPPED.
 IF THE TIME $XX(1) = 0$ ----- ON THE FIRST
 ACCESS OF RODMOD, THE CONTROL PODS ARE
 POSITIONED AS SPECIFIED AT POINT 1 IN THE
 HISTORY ($NZI(J,L=1)$). THEN ON EACH SUBSEQUENT
 ACCESS FOR WHICH THIS NUMBER $IX(10)=0$, THE
 POINT IN THE HISTORY L IS INCREMENTED BY 1.
 IF L EXCEEDS THE NUMBER OF POINTS GIVEN (NCYD
 ON 'RODSET') THE LAST POINT $L=NCYD$ IS REUSED.
 THIS OPTION ASSURES THAT THE RODS ARE
 POSITIONED AS SPECIFIED FOR ALL POINTS IN THE
 HISTORY, IN ORDER, WITH NO POINTS SKIPPED.
 IF THE CYCLE NUMBER FROM THE FILE 'ZNATDN' IS
 GREATER THAN THE CYCLE NUMBER IN THE PREVIOUS
 RODMOD ACCESS, L IS RESET TO 1.
 L- POSITION RODS AS SPECIFIED (AT THIS POINT L IN
 THE HISTORY) BY THE DATA ($NZI(J,L)$) IN THE
 FILE 'RODSET'.

C
 CD
 CD IX(11) OPTION TO INSERT SHUT-DOWN (SAFETY) RODS.
 CD 0- NO.
 CD 1- AFTER ANY OPTION $IX(10) \neq 0$ (ABOVE) HAS BEEN
 CD APPLIED, INSERT SHUT-DOWN RODS USING SPECIAL
 CD DATA PRESENT IN THE FILE 'RODSET'. IF OPTION
 CD $IX(10)=0$, ONLY SHUT-DOWN RODS ARE INSERTED
 CD AND NO OTHER POSITIONING IS DONE. WHEN THIS
 CD OPTION IS SPECIFIED, AFTER ANY POSITIONING IS
 CD DONE ($IX(10) \neq 0$) AND BEFORE INSERTION OF
 CD SHUT-DOWN RODS, A NEW VERSION OF THE ZONE
 CD DENSITY FILE 'YNATDN' IS WRITTEN. THIS IS DONE
 CD SO THAT RECOVERY OF THE CONCENTRATIONS PRIOR
 CD TO INSERTION OF THE SHUT-DOWN RODS MAY BE DONE
 CD ON THE NEXT OR ANY SUBSEQUENT ACCESS (SEE
 CD $IX(10)=-4$, OR -3 ABOVE).
 CD NORMALLY IT IS NECESSARY TO SOLVE A NEUTRONICS
 CD PROBLEM BEFORE AND AFTER SUCH INSERTION
 CD WITHOUT OTHER ACTION (AS EXPOSURE) IN BETWEEN
 CD TO PRODUCE TWO VALUES OF THE MULTIPLICATION
 CD FACTOR GIVING ΔK FOR THE INSERTION.
 CD 2- SAME AS 1 BUT THE NEW VERSION OF 'YNATDN' IS
 CD WRITTEN BEFORE ANY POSITIONING ($IX(10) \neq 0$)
 CD IS DONE.

(CONT)

```

CE      IX(12)      OPTION ON SAVING THE ZONE DENSITY INTERFACE FILE
CE                  'YNATDN', ONLY IF IX(11)=0.
CE                  -1- NO.
CE                  0- IF NO FILE EXISTS, CREATE IT WITH DENSITIES -
CE                      A) AFTER FULL ROD INSERTION (IX(10)=-2)
CE                      IF SPECIFIED, OR
CE                      B) RECOVERED FROM LATEST 'ZNATDN' FILE.
CE                  IF A FILE EXISTS, NONE IS WRITTEN.
CE                  1- WRITE IT AFTER FULL ROD INSERTION (IX(10)=-2).
CE                  2- WRITE IT AFTER ANY ROD POSITIONING
CE                  SPECIFICATION.
C
CD      IX(13)      OPTION ON DELETING THE LATEST VERSION OF THE ZONE
CE                  DENSITY FILE 'YNATDN' AFTER APPLYING SPECIFICATIONS,
CE                  PROVIDED IT WAS NOT CREATED THIS ACCESS.
CE                  0- NO.
CE                  1- DELETE THE LATEST VERSION OF 'YNATDN' BUT
CE                      ONLY IF MORE THAN 1 VERSION EXISTS.
C
CD      IX(14)      BLACK ABSORBER OPTION FOR ROD ZONES.
CE                  0- NO.
CE                  1- YES (GENERALLY REQUIRED FOR THERMAL REACTORS
CE                      WITH RODS REPRESENTED EXPLICITLY).
CE                      NORMALLY THE LATEST VERSION OF 'GEODST' IS
CE                      READ TO OBTAIN THE BLACK ABSORBER ZONES AND
CE                      A NEW VERSION IS WRITTEN IF ONLY ONE EXISTS,
CE                      OTHERWISE THE LATEST VERSION IS RE-WRITTEN.
CE                      IF IX(10)=-4, THE NEXT-TO-LATEST VERSION OF
CE                      'GEODST' IS READ TO OBTAIN THE BLACK ABSORBER
CE                      ZONES.
CE                      WHEN CONTROL ROD INTERCHANGES ARE APPLIED,
CE                      BLACK ABSORBER CONDITIONS ARE MOVED WITH THE
CE                      INTERCHANGES. SOME ROD ZONES MAY NOT BE BLACK
CE                      AND NEVER BECOME BLACK IF ONLY THE ROD
CE                      INTERCHANGE SPECIFICATIONS ARE USED (NO
CE                      INSERTION SPECIFICATIONS). WHEN INSERTION
CE                      SPECIFICATIONS ARE APPLIED, ALL ZONES
CE                      CONTAINING CONTROL ROD ARE ASSIGNED THE BLACK
CE                      ABSORBER CONDITION, LIMITING APPLICATION TO
CE                      ONLY FULLY EXPLICIT CONTROL ROD
CE                      REPRESENTATION.
C
C-----

```

FIGURE 2. CONTENTS OF THE CONTROL ROD POSITIONING INTERFACE 'RODSET'.

```

C*****
CN      DATE 1-1-78
C
CP      RODSET
C
CE      CONTROL ROD REFERENCE POSITIONING DATA
C
C*****

C-----
CP      FILE IDENTIFICATION
C
CL      HNAME, (HUSE(I), I=1,2), IVERS
C
CW      (3*MULT+1) = NUMBER OF WORDS.
C
CD      HNAME      FILE NAME (A6) 'RODSET'.
CD      HUSE       USER IDENTIFICATION (A6).
CD      IVERS      FILE VERSION NUMBER.
C
CV      MULT       1 FOR LONG WORD, 2 FOR SHORT WORD MACHINES.
C
C-----

C-----
CE      FILE REFERENCE INFORMATION  (1D RECORD)
C
CL      NCPN, NFRN, NCR, NERT, NSRPS, NCYD, NSE, NOE, ISV, NRW, MRI, NSH,
CI      (I1(I), I=1,8)
C
CW      (20) = NUMBER OF WORDS.
C
CD      NCEN       NUMBER OF CONTROL ROD ZONE NUCLIDES.
C
CD      NFRN       NUMBER OF CONTROL ROD FOLLOWER ZONE NUCLIDES.
C
CD      NCR        NUMBER OF DIFFERENT ZONE SETS (RODS).
C
CD      NERT       NUMBER OF ENTRIES IN THE REFERENCE TABLE OF ROD
CD                ZONES.
C
CD      NSRPS      NUMBER OF SETS OF ROD POSITION SPECIFICATIONS.
C
CD      NCYD       NUMBER OF POINTS IN THE HISTORY (BETWEEN REFUELINGS)
CD                FOR WHICH ROD POSITIONING DATA IS SPECIFIED.
C

```

(CONT)

CD NSF NUMBER OF ZONES FOR WHICH SPECIAL FULL ROD INSERTION
 CD (OR WITHDRAWAL) DATA ARE SPECIFIED BELOW, USED FOR
 CD 'RODINS' OPTION IX(10)=-2, OR =-1. IF FULL ROD
 CD INSERTION (WITHDRAWAL) IS SPECIFIED AND THIS SPECIAL
 CD DATA IS NOT PRESENT, THE MATERIAL ADP (ADP) WILL BE
 CD INSERTED IN ALL ROD ZONES NRZ BELOW.
 C
 CD NOF OPTION ON USING FULL ROD INSERTION (WITHDRAWAL)
 CD DATA.
 CD 0- USE ONLY SPECIFICATIONS GIVEN BY SPECIAL
 CD FULL ROD INSERTION (WITHDRAWAL) DATA.
 CD 1- INSERT MATERIAL ADP (ADP) IN ALL ROD ZONES NRZ
 CD FIRST, THEN APPLY SPECIAL FULL ROD INSERTION
 CD (WITHDRAWAL) DATA IN AN OVERLAY SENSE.
 C
 CN *****NOTE FOR FULL ROD INSERTION, OR FULL ROD
 CN WITHDRAWAL, ALL ROD AND FOLLOWER CONCENTRATIONS
 CN ARE ZEROED IN THE SPECIFIED ZONES PRIOR TO
 CN THE INSERTION.
 C
 CD ISV OPTION ON SAVE DATA RECORDS.
 CD 0- NO SAVE DATA RECORDS PRESENT ON THIS FILE.
 CD GT.0- THE TWO SAVE DATA RECORDS ARE PRESENT ON
 CD THIS FILE.
 C
 CN *****NOTE - THE SAVE DATA RECORDS ARE A RECORD OF
 CN THE POSITIONING. IT IS RECOMMENDED THAT THIS
 CN OPTION BE 0 IN WHICH CASE THE CODE CREATES
 CN THE TWO RECORDS ON FIRST ACCESS.
 C
 CD NRW OPTION ON CONCENTRATIONS IN MAKE-UP ZONE FOR ROD
 CD WITHDRAWAL (NZI .GT. 0 BELOW) FOR 'RODINS' OPTION
 CD IX(10) GE. 0.
 CD 0- ZERO ROD CONCENTRATIONS AND REPLACE FOLLOWER
 CD CONCENTRATIONS WITH ADP DATA (IF PRESENT).
 CD 1- ONLY ZERO ROD CONCENTRATIONS.
 CD 2- DO NOT CHANGE ANY CONCENTRATIONS.
 C
 CD MRI OPTION ON CONCENTRATIONS IN MAKE-UP ZONE FOR ROD
 CD INSERTION (NZI .LT. 0 BELOW) FOR 'RODINS' OPTION
 CD IX(10) GE. 0.
 CD 0- REPLACE ROD CONCENTRATIONS WITH ADP DATA.
 CD 1- DO NOT CHANGE ANY CONCENTRATIONS.
 CD 2- ONLY ZERO ROD CONCENTRATIONS.
 CD 3- ZERO ROD CONCENTRATIONS AND REPLACE FOLLOWER
 CD CONCENTRATIONS WITH ADP DATA (IF PRESENT).
 C
 CD NSH NUMBER OF ZONES FOR WHICH SPECIAL SHUT-DOWN ROD DATA
 CD ARE GIVEN BELOW. THIS DATA MUST BE PRESENT IF THE
 CD 'RODINS' OPTION IX(11) =1.
 C
 C-----

(CONT)


```

C-----
CE      REFERENCE NUCLIDE DATA (2D RECORD)
C
CC      PRESENT IF NCPN + NFRN .GT. 0
C
CL      (HNP(N),N=1,NCPN),(HNF(N),N=1,NFRN),(ADF(N),N=1,NCPN),(ADF(N),N=1,
CL      NFRN)
C
CW      ((MULT+1)*(NCPN+NFRN)) = NUMBER OF WORDS.
C
CD      HNP      POD ZONE NUCLIDE USER UNIQUE NAME, HISONN (A6).
C
CD      HNF      FOLLOWER ZONE NUCLIDE USER UNIQUE NAME, HISONN (A6).
CD      MAY INCLUDE NUCLIDES IN THE ROD LIST HNR.
C
CD      ADF      ROD NUCLIDE DENSITIES (ATOMS/BW-CM) - MAY BE ROD
CD      INSERTION FOLLOWER (TOP OF ROD) MATERIAL. IF SO
CD      IT CANNOT BE USED FOR FULL ROD INSERTION.
C
CD      ADF      FOLLOWER NUCLIDE DENSITY (ATOMS/BW-CM) - USED FOR
CD      POD REMOVAL (BOTTOM OF ROD).
C
C-----

```

```

C-----
C
CR      REFERENCE TABLE OF ROD ZONES (3D RECORD)
C
CC      ALWAYS PRESENT
C
CL      (NRZ(I),I=1,NERT)
C
CW      (NERT) = NUMBER OF WORDS.
C
CD      NRZ      NUMBER OF A ZONE.
C
CN      THIS DATA IS PRESENTED IN SETS OF ZONE NUMBERS, EACH SET
CN      REPRESENTING A ROD OR BLOCK OF THEM. EACH SET OF DATA IS
CN      FOLLOWED BY A ZERO ENTRY. REFERENCE TO A SET IS BY ORDER OF
CN      PRESENTATION (=J IN NZI(J,L) BELOW). THE ORDERING OF THE
CN      ZONE NUMBERS IN EACH SET INDICATES ROD END POSITION BY
CN      INSERTION. THUS ROD INSERTION IN ONLY THE FIRST ZONE GIVEN
CN      WOULD BE MINIMUM INSERTION AND ROD INSERTION IN THE LAST
CN      ZONE IN THE LIST WOULD BE MAXIMUM INSERTION.
CN      IF THE LAST ZONE NUMBER IN A SET IS THE SAME AS THE FIRST
CN      ZONE NUMBER, THIS INDICATES A 'CLOSED-LOOP' SET OF ZONES.
CN      A 'CLOSED-LOOP' SET OF ZONES IS NOT A SET OF ROD ZONES, BUT
CN      IS A SET IN WHICH ALL NUCLIDES IN THE ZONES MAY BE
CN      INTERCHANGED. ONLY THE OPTIONS IX(10) =0 OR =1 APPLY AND
CN      THESE SETS WILL BE IGNORED FOR ALL OTHERS. SEE NZI BELOW.
CN      THERE MAY BE SUBZONES IN THE PROBLEM, BUT THE ROD AND
CN      FOLLOWER NUCLIDES MUST BE ASSIGNED TO AND HANDLED ON A
CN      ZONE BASIS, NOT SUBZONE.
C

```

(CONT)

CN NCR SETS OF ZONE NUMBERS ARE REQUIRED.

C

C-----

C

C

CC THE FOLLOWING RECORDS ARE IN SETS OF TWO, NRPS OF THEM.

C

C-----

C

CF REFERENCE POINT IN HISTORY (40 RECORD)

C

CC

PRESENT IF NCYD .GT. 0

C

CL (PEH(L),L=1,NCYD),NOP,(J1(I),I=1,10)

C

CC

(NCYD*11) = NUMBER OF WORDS.

C

CC

PEH FRACTION OF THE EXPOSURE TIME BETWEEN PEEINGS,
0 MEANS START, 1.0 MEANS END, GT 1.0 IS GARBAGE.

C

CC

NOP OPTION DISCUSSED BELOW.

C

C-----

C

CF REFERENCE SET OF ROD POSITION SPECIFICATIONS (50 RECORD)

C

CC

PRESENT IF NCYD .GT. 0

C

CL

((NZI(J,L),J=1,NCR),L=1,NCYD)

C

CC

(NCR*NCYD) = NUMBER OF WORDS.

C

CC

NZI HAS A MEANING WHICH IS DEPENDENT ON OPTION NOP.

C

C

C

CN

IF NOP IS 0

C

C

CN

NZI IS THE NUMBER OF THE LAST ZONE IN SET J (NRZ ABOVE)

CN

HAVING ROD INSERTION AT POINT L IN THE HISTORY, I.E., ALL

CN

ROD AND FOLLOWER MATERIAL CONCENTRATIONS ARE ZEROED IN ALL

CN

ZONES IN THE SET - THEN ROD MATERIAL (CONCENTRATIONS ADR)

CN

IS INSERTED IN ORDER IN ALL ZONES IN THE SET THROUGH NZI AND

CN

FOLLOWER (CONCENTRATIONS ADP) IS INSERTED IN ORDER FOR ALL

CN

REMAINING ZONES IN THE SET. NOTE THAT ONLY THE NUCLIDES

CN

THAT ARE ASSIGNED TO EACH ZONE, OUT OF THE HNF AND HNP LIST

CN

ABOVE, ARE INVOLVED. THIS OPTION COULD BE USED TO INITIALIZE

CN

THE CONTENTS OF THE ROD ZONES AT SOME POINT IN THE HISTORY.

CN

ROD-FOLLOWER EXPOSURE CANNOT BE FOLLOWED.

CN

IF NZI=0 FOR SOME SET J, NO CHANGES WILL BE MADE IN THAT

CN

SET OF ROD ZONPS.

CN

THIS OPTION WILL BE IGNORED FOR A 'CLOSED-LOOP' SET.

(CONT)

CN IF NOP = 0. 1
 C
 CN NZI IS THE NUMBER OF ZONE MATERIAL INTERCHANGES REQUIRED
 CN FOR SET J AT POINT L IN THE HISTORY TO EFFECT THE DESIRED
 CN ROD WITHDRAWAL (OR INSERTION IF NZI .LT. 0). ROD AND
 CN FOLLOWER NUCLIDE CONCENTRATIONS (IN THE LIST OF ZONES ABOVE)
 CN WILL BE INTERCHANGED IN A PUSH-DOWN SENSE NZI TIMES. FOR
 CN EXAMPLE FOR A NON 'CLOSED-LOOP' SET, IF THE NPZ ZONE
 CN NUMBERS FOR SET J WERE
 CN 3 (M3) 6 (M6) 2 (M2) 7 (M7) 5 (M5)
 CN WHERE THE M'S REPRESENT THE ROD AND/OR FOLLOWER NUCLIDE
 CN CONCENTRATIONS IN THE ZONES AT POINT L IN THE HISTORY, THEN
 CN IF NZI = +2 (ROD WITHDRAWAL) TWO SUCCESSIVE INTERCHANGES
 CN WOULD BE MADE AND THE FINAL CONTENTS OF THE ZONES WOULD BE
 CN 3 (M2) 6 (M7) 2 (M5) 7 (M6) 5 (M3)
 CN WHERE PN REPRESENTS THE CONCENTRATIONS INSERTED IN MAKE-UP
 CN ZONE 5 (SEE OPTION MRW ABOVE). IF NZI HAD BEEN -1 (ROD
 CN INSERTION), THEN THE CONTENTS OF THE ZONES WOULD BE
 CN 3 (PN) 6 (M3) 2 (M6) 7 (M2) 5 (M7)
 CN WHERE PN REPRESENTS THE CONCENTRATIONS INSERTED IN MAKE-UP
 CN ZONE 3 (SEE OPTION MRI ABOVE).
 CN THIS NOP=1 OPTION MUST BE USED IF THE ROD-FOLLOWER EXPOSURE
 CN IS TO BE FOLLOWED.
 C
 CN IF A SET OF ZONES IS A 'CLOSED-LOOP' SET, I.E., THE LAST
 CN ZONE NUMBER EQUAL TO THE FIRST ZONE NUMBER, THEN MATERIAL
 CN IN THE SECOND (OR NEXT TO LAST IF NZI.LT.0) ZONE IS SAVED -
 CN THEN AFTER ALL INTERCHANGES HAVE BEEN MADE, THIS MATERIAL
 CN REPLACES THAT IN THE LAST (OR FIRST) ZONE IN THE LIST. FOR
 CN THE 'CLOSED-LOOP' SET, ALL NUCLIDES IN THE ZONES ARE
 CN INTERCHANGED, NOT JUST THOSE SPECIFIED BY HNR AND HNP.
 CN ALL ZONES IN A 'CLOSED-LOOP' SET MUST HAVE THE SAME NUCLIDES
 CN IN THE SAME ORDER. NORMALLY ONLY ONE INTERCHANGE WOULD BE
 CN SPECIFIED. FOR EXAMPLE IF THE 'CLOSED-LOOP' SET WERE
 CN 3 (M3) 6 (M6) 2 (M2) 7 (M7) 3 (M3)
 CN THEN AFTER ONE INTERCHANGE (NZI=+1) THE ZONES WOULD CONTAIN
 CN 6 (M2) 2 (M7) 7 (M3) 3 (M6)
 CN FOR NZI=-1, THE ZONES WOULD CONTAIN
 CN 3 (M7) 6 (M3) 2 (M6) 7 (M2)
 C
 CN TO CARRY OUT A CORRECT ROD POSITIONING SCHEDULE WITH THE
 CN AUTOMATED PROCEDURE, THE REPOSITIONING MUST INCLUDE EACH
 CN OF THE STEPS (POINTS IN THE HISTORY) IN THIS SET OF
 CN SPECIFICATIONS IF THEY ARE UNIQUE. (COMPLICATED
 CN SPECIFICATIONS CAN BE USED WHICH REQUIRE SELECTED
 CN APPLICATIONS, ONE OR MORE, TO CAUSE A PROPER SCHEDULE OF
 CN CONTROL ROD REMOVAL).
 CN THE OPTION NOP=0 IS GENERALLY MORE FLEXIBLE REGARDING THE
 CN POINTS IN THE HISTORY WHICH CAN BE USED FOR THE EXPOSURE
 CN THAN NOP=1, I.E., POINTS IN THE HISTORY MAY BE SKIPPED AND
 CN PROPER POSITIONING STILL BE ACCOMPLISHED.
 C

(CONT)

CN FOR BOTH THE ABOVE OPTIONS FOR NON 'CLOSED-LOCP' SETS, ONLY
 CN THOSE NUCLIDES HSR AND HNF THAT ARE ASSIGNED TO THE ZONES
 CN ARE INVOLVED. GENERALLY THE SAME ROD AND/OR FOLLOWER
 CN NUCLIDES MUST BE ASSIGNED TO ALL ZONES OF A SET J (NRZ
 CD ABOVE), BUT NOT NECESSARILY IN THE SAME ORDER. CONSISTANT
 CN NUCLIDE-ZONE-CROSS SECTION REFERENCING IS ESSENTIAL.

C
 C
 CN

IF NOF .EQ. 2

C
 CN

NZI IS PARTS PER 1000, EQUAL TO THE FRACTION OF ROD
 CN INSERTION WHEN THE ROD ZONES ARE NOT REPRESENTED
 CN EXPLICITLY, IE., FOR TWO-DIMENSIONAL CALCULATIONS.
 CN LET $X = NZI(J,L)/1000$. THEN FIRST, ALL ROD AND FOLLOWER
 CN CONCENTRATIONS ARE ZEROED IN THE ZONES NPZ IN SET J AT THIS
 CN POINT IN THE HISTORY. THEN THE ROD CONCENTRATIONS ARE
 CN INSERTED AS $N = X*ADR$, THEN THE FOLLOWER CONCENTRATIONS
 CN ARE ADDED, $N = N + (1-X)*ADP$.
 CN *****NOTE THAT IF THE FULL ROD INSERTION (WITHDRAWAL) DATA
 CN IS PRESENT (NSE.GT. 0), THEN THE DATA NZR, ADR, AND APD IS
 CN USED INSTEAD OF THE DATA NRZ, ADR, ADP. THE FULL ROD
 CN INSERTION OPTION FOR DOES NOT APPLY. IN THIS CASE ONLY THE
 CN NZI(J=1,L) DATA IS USED TO APPLY TO THE 1 SET OF ZONES NZR.
 CN FOR ANY SET J FOR WHICH NZI.LT.0, NO CHANGES IN THE ZONES
 CN IN THAT SET WILL BE MADE.

C
 C

CF SPECIAL FULL ROD INSERTION (WITHDRAWAL) DATA (6D RECORD)

C

CC PRESENT IF NSE.GT.0

C

CL (NZR(I), I=1, NSE)

C

CW (NSE) = NUMBER OF WORDS.

C

CD NZR NUMBER OF ROD ZONE.

C

CF SPECIAL FULL ROD INSERTION (WITHDRAWAL) DATA (7D RECORDS)

C

CC PRESENT IF NSE.GT.0

C

C

CL (ARD(J), J=1, NCRN), (APD(K), K=1, NFRN) ----SEE STRUCTURE BELOW----

C

CL DO 1 N = 1, NSE

CL 1 READ(N) *LIST AS ABOVE*

C

CW (NCRN+NFRN) = NUMBER OF WORDS.

C

(CONT)

CE ARD ATOM DENSITY OF ROD NUCLIDE.
 C
 CD RPD ATCH DENSITY OF FOLLOWER NUCLIDE.
 C
 C-----

C-----
 CE SPECIAL SHUT-DOWN ROD DATA (8D RECORD)
 C
 CC PRESENT IF NSH.GT.0
 C
 CL (NSH(I),I=1,NSH)
 C
 CW (NSR) = NUMBER OF WORDS.
 C
 CD NSH NUMBER OF ROD ZONE.
 C
 C-----

C-----
 CE SPECIAL SHUT-DOWN ROD DATA (9D RECORDS)
 C
 CC PRESENT IF NSH.GT.0
 C
 C
 CL (SHR(J),J=1,NCRN) ---- SEE STRUCTURE BELOW ----
 C
 CL DO 1 N = 1,NSH
 CI 1 READ(N) *LIST AS ABOVE*
 C
 CW (NCPN) = NUMBER OF WORDS.
 C
 CD SHR ATOM DENSITY OF ROD NUCLIDE.
 C
 C
 C-----

C-----
 CE INTEGER SAVE DATA (10D RECORD)
 C
 CC PRESENT IF ISV.GT.0
 C
 CL (IR(I),I=1,100)
 C
 CW (100) = NUMBER OF WORDS.
 C
 CD IR INTEGER SAVE DATA - INITIALIZE ZERO.
 C
 CD IR(1) COUNT OF C.R.P. ACCESSES.
 CD IR(2) CYCLE NUMBER OF LAST C.R.P. ACCESS.
 CD IR(3) C.R.P. OPTION (IX(10)='RODINS') OF LAST ACCESS.
 CD IR(4) MEMORY REQUIRED FOR LAST C.R.P. ACCESS.
 CD IR(5) PCINT IN HISTORY OF LAST ACCESS.
 C
 C-----

(CONT)

```

C-----
CF      REAL SAVE DATA  (11D RECORD)
C
CC      PRESENT IF ISV.GT.6
C
CL      (XR(I),I=1,100)
C
CW      (100) = NUMBER OF WORDS.
C
CD      XR      REAL SAVE DATA - INITIALIZE ZERO.
C
CD      XR(1)    TOTAL CYCLE TIME (XR(1)-'RODINS') OF LAST ACCESS.
CE      XR(2)    TIME INTO CYCLE (TIME-'ZBATDN') OF LAST ACCESS.
CD      XR(3)    FRACTION TIME INTO CYCLE OF LAST ACCESS.
C
CW      INFORMATION IS PLACED IN THESE TWO RECORDS BY THE CODE
CW      WHICH IS NEEDED FOR AUTOMATION OF SOC POSITIONING AND
CW      VERIFICATION TESTING. DATA NOT SPECIFIED HERE IS RESERVED
CW      FOR CODE INTERNAL USE AND SHOULD NOT BE SUPPLIED BY THE
CW      USER, BUT MAY BE RECOVERED FROM A FILE WRITTEN IN A
CW      PREVIOUS RUN TO CONTINUE A CALCULATION. THE USER SHOULD NOT
CW      SPECIFY THIS DATA AS A NORMAL INPUT.
C-----
CEOF

```

insertion condition. It may be desirable to supply special repositioning specifications to effect a new schedule. But it should be possible to treat many situations directly with a simple set of initial specifications and code instructions. There are limitations and special considerations which should be understood to permit reliable application. However, the application of this procedure should be considered to reduce the amount of special instructions required.

With the automated procedure, the rod insertion condition is made dependent on the fractional exposure time for that cycle or on the count of repositionings which have been done previously. When based on the count of previous repositionings, this count is reinitialized to start over whenever any special action is taken or if the cycle number changes, allowing multi-cycle application through more than one fueling.

D. Application Considerations

We emphasize that care must be taken in application to effect the desired state of control rod insertion at any point in a reactor history. There must be consistency between the data files used by the code modules. Here we note some considerations and emphasize limitations due to implemented procedures in the code modules.

Each zone in a problem is assigned a set of unique nuclide identification labels (user names). A single set of identification labels is used to define nuclides associated with control rods and another set to define nuclides associated with control rod follower. Different nuclides and individual concentrations may be associated with different control rods through the flexibility of assigning nuclide names to zones. This is done in the data for the neutronics code, not in the special data needed to describe control rod positioning action. Incorrect assignment of nuclide names to zones could cause all rods to be inserted everywhere there are rods, or none at all! Note that control rods and follower are treated on the zone scale, not the subzone scale, although there may be subzones.

There are certain limitations in application of the specifications which may not be obvious to the reader. The specifications for control rod insertion/withdrawal were written to allow considerable flexibility and yet have a simple form. Simple situations are easy to model. It may not be possible to model complicated situations without making compromises.

Exposure may be treated for the control rod and follower nuclides (if the exposure code module is so instructed). However, this is not possible when the internal black absorber zone treatment is done (on a macroscopic scale without calculation of the flux level in black energy groups), nor is it possible with the fractional rod insertion specifications. No exposure occurs in false zones which are used to model certain situations.

Simple rod and follower specifications do not allow variation for different control rods. Again explicit rod positioning may be required to treat many situations. False zones may be required to satisfy the needs,

for example, to store nuclide concentrations during rod removal if later reinsertion is to be done and exposure effects accounted for.

With the nuclides assigned unique names, each associated with a unique set of microscopic cross sections, there is no provision for cross section changes to occur upon repositioning. (An extension to the capability would be the use of absolute nuclide names for identification and unique labels associated with zones.)

Consider that the local coolant volume fraction changes upon rod positioning, as when the follower enters a zone. This may be accounted for directly by including the coolant nuclide(s) with the control rod and follower nuclides, but there can be limitations, especially if the rods are not represented explicitly and if other data is used from thermal, hydraulic calculations to account for coolant density and temperature. These remarks may also apply to structural material and fixed moderator.

Considerable flexibility is admitted by the use of special data for the nuclides involved, such as two nuclides and associated cross sections which represent control material or coolant. These may have identical microscopic cross sections. This would allow the separate specification of additional coolant to be associated with a control rod follower, for example. It allows treating quite different control rods directly, and indeed mixtures of different rods when homogenized into zones containing fuel.

There are limitations when some rods are represented explicitly and assigned black absorber conditions and others are not. With application of full rod insertion specifications, either all rod zones are assigned the black absorber condition, or none are, on option. Repositioning will properly move the black absorber conditions only if the option to do so is exercised.

Control rods could be inserted by one of five methods:

- 1) Special rod insertion data, zones arbitrary,
- 2) Partial insertion to a zone in each zone set,

- 3) Fractional insertion by zone sets,
- 4) Repositioning data, and
- 5) Recovery of data saved from an earlier point in the history,

plus there is capability for applying two sets of specifications. Some of these obviously have special applications. The choice of method to use depends on the situation to be modeled, the repositioning scheme(s) to be used, and the requirements for repositioning. The requirements and action to be taken should be carefully analyzed.

Consider the automated positioning scheme based on exposure time. There are two ways to specify explicit positioning data. One way defines specific interchanges to be made at points in the history which are fractions of the cycle time (not based on access count). These must generally be fully carried out to effect a desired history. Skipping one would eliminate a step of positioning. The other scheme defines end rod positions so that desired positions are effected independently of the number of times rods are to be positioned. The former requires proper actions to be carried out, the latter is more flexible. With the latter, specifications for many positions can be given, the end of the rod in each zone along the rod path, for example, and selection from these possibilities is then done at each time of repositioning based on fractional cycle time. The latter type of specification is the more general one and may find the most use.

We found it desirable to permit more than one set of positioning specifications to apply at a specific point in time. This capability was implemented, but little study has been made of the ramifications and limitations associated with this procedure. We strongly recommend the testing of complicated procedures before actual use, as by examining the nuclide density changes effected by a set of specifications with a simple test problem or by treating an actual case without doing neutronics and exposure calculations. We have not found practical applications for control rod withdrawal paths which cross or otherwise involve the same zones, nor for the use of the closed loop interchange specification for control rods (useful for rotating fuel elements perhaps).

Finally we note that the control rod positioning specifications consider discrete zones in a geometric description, capability directed at solving three-dimensional problems. There is no provision for adjusting the geometric mesh nor smearing the end of the control rod. Our past experience showed that adjusting the control rod position to effect a critical state in the process of solving the neutronics problem is usually not practical. Either a relatively long zone would have to be used for smearing the rod end or the search procedure tended to cause excessive rod movement and was difficult to converge. We recognize that schemes are in use to selectively position control rods to reduce power density peaking during a history of operation and even negative time exposure from the end of history. We do not condone the calculation of a reactor operating history at a non-critical state. Still it does appear that an explicit control rod positioning schedule is most attractive for design level analysis with automated procedures used to calculate a history and then recalculate it with adjusted initial enrichments and a retuned rod positioning schedule. We expect to add a sophisticated control module to this code system to enhance the capability to effect desired conditions using the RODMOD code and data files defined in this report. Clearly all the data interfacing requirements have not been satisfied for such enhanced capability requiring future extensions.

E. System Control Requirements

The job control instructions required to execute RODMOD are similar to those shown in section 8 of reference 3 and will not be repeated here. The user-supplied job control instructions are discussed under Sample Problems below.

F. Sample Problems

Three sample problems are given here. The first is a fictitious problem with no neutronics calculations used to demonstrate rod positioning by specifying various options. The second is a fast reactor two-dimensional problem with neutronics solutions obtained for each of several rod positions without exposure calculations. The third problem treats an exposure history between successive fuelings using the automated procedure for control

rod positioning. Figure 5 shows the job control instructions for the problems and Figure 6 shows selected output from the problems.

1. Problem 1

Figure 3 shows the placement of the zones in a simple two-dimensional mesh with the nuclides assigned to the zones and their initial concentrations. The zones 2 through 10, 12 through 20, and 22 through 30 are sets of rod zones. Figure 4 shows the contents of the zones after each access of RODMOD. Shaded rod zones indicate which zones contain rod material, and the numbers in zones 1, 11, 21, and 31 are the nuclide concentrations.

Each access of RODMOD was preceded by an access to the special processor DUTLIN in order to change the instruction in the record RODINS. Referring to Figure 1, Figure 2, Figure 4, and the input instructions shown in Figure 5, the first access specifies full rod insertion with RODINS option IX(10) = -2. The full rod insertion option NSE in RODSET specifies that the material "ADR" is to be used. For the second access, point 1 in the history (out of the 5 that are given in RODSET) the rods are to be withdrawn (the NZI data) 4 positions for the first set of rod zones, 2 positions for the second set, and 6 positions for the third set. Also one "closed-loop" interchange is to be made for the fourth set of zones. The third access further withdraws the rods using point 2 in the history and another "closed-loop" interchange is made.

The second and third accesses use the second NSRPS set of data with option NOP = 1 as specified by RODINS option IX(8) = 2. The fourth access specifies that the first set of NSRPS data is to be used, NOP = 0, and the NZI data at point 3 in the history specifies that rod material is to be inserted in zones 2 through 5, 12 through 16, and 22 through 27. Follower is to be inserted in all other zones in the sets. The fifth access again uses the second NSRPS set of data at point 4 in the history to insert rods in the zones and do another "closed-loop" interchange. The option MRI = 3 in RODSET specifies that rod nuclide concentrations are to be zeroed and follower nuclide concentrations ADF are to be inserted in the zones 2, 12, and 22, (as was done for the zones 10, 20, and 30 (MRW = 0) in the second

and third accesses). The sixth access specifies further insertion and one more "closed-loop" interchange which returns the concentration in zones 1, 11, 21, and 31 to their initial values.

Figure 3. Placement of Zones for Sample Problem 1

Rod Set 1		Rod Set 2		Rod Set 3		
Z1	Z2	Z11	Z12	Z21	Z22	Z31
	Z3		Z13		Z23	
	Z4		Z14		Z24	
	Z5		Z15		Z25	
	Z6		Z16		Z26	
	Z7		Z17		Z27	
	Z8		Z18		Z28	
	Z9		Z19		Z29	
	Z10		Z20		Z30	

Nuclides	Fuel1	Rods1	Fuel1	Rods2	Fuel1	Rods3	Fuel1
	Struc	Fol11	Struc	Fol12	Struc	Fol13	Struc
	Allzn	Allzn	Allzn	Allzn	Allzn	Allzn	Allzn
Initial Concentrations	1	0	11	0	21	0	31
	10	0	110	0	210	0	310
	0	0	0	0	0	0	0

Figure 4. Contents of Zones After Each RODMOD Access

	Z2		Z12		Z22	
1	Z3	11	Z13	21	Z23	31
10	Z4	110	Z14	210	Z24	310
0	Z5	0	Z15	0	Z25	0
	Z6		Z16		Z26	
Z1	Z7	Z11	Z17	Z21	Z27	Z31
	Z8		Z18		Z28	
	Z9		Z19		Z29	
	Z10		Z20		Z30	

Access 1

	Z2		Z12		Z22	
11	Z3	21	Z13	31	Z23	1
110	Z4	210	Z14	310	Z24	10
0	Z5	0	Z15	0	Z25	0
	Z6		Z16		Z26	
Z1	Z7	Z11	Z17	Z21	Z27	Z31
	Z8		Z18		Z28	
	Z9		Z19		Z29	
	Z10		Z20		Z30	

Access 2

	Z2		Z12		Z22	
21	Z3	31	Z13	1	Z23	11
210	Z4	310	Z14	10	Z24	110
0	Z5	0	Z15	0	Z25	0
	Z6		Z16		Z26	
Z1	Z7	Z11	Z17	Z21	Z27	Z31
	Z8		Z18		Z28	
	Z9		Z19		Z29	
	Z10		Z20		Z30	

Access 3

	Z2		Z12		Z22	
21	Z3	31	Z13	1	Z23	11
210	Z4	310	Z14	10	Z24	110
0	Z5	0	Z15	0	Z25	0
	Z6		Z16		Z26	
Z1	Z7	Z11	Z17	Z21	Z27	Z31
	Z8		Z18		Z28	
	Z9		Z19		Z29	
	Z10		Z20		Z30	

Access 4

	Z2		Z12		Z22	
31	Z3	1	Z13	11	Z23	21
310	Z4	10	Z14	110	Z24	210
0	Z5	0	Z15	0	Z25	0
	Z6		Z16		Z26	
Z1	Z7	Z11	Z17	Z21	Z27	Z31
	Z8		Z18		Z28	
	Z9		Z19		Z29	
	Z10		Z20		Z30	

Access 5

	Z2		Z12		Z22	
1	Z3	11	Z13	21	Z23	31
10	Z4	110	Z14	210	Z24	310
0	Z5	0	Z15	0	Z25	0
	Z6		Z16		Z26	
Z1	Z7	Z11	Z17	Z21	Z27	Z31
	Z8		Z18		Z28	
	Z9		Z19		Z29	
	Z10		Z20		Z30	

Access 6

2. Problem 2

This problem is a two-dimensional large core fast breeder reactor benchmark problem which is described in reference 5. Referring to the layout for this problem shown in Figure 6 (page 78), the control rod zones are numbered 12 through 14, with control rod zone 11 designed as a shut-down rod.

In order to move material from one rod zone to another (which would be the case for a three-dimensional problem), four zones, 7 through 10, are identified as having concentrations assigned, but these are false zones not in the mesh. Zone 7 contains follower material (all rod out), zone 8 contains nuclide concentrations for 1/4 rod insertion, zone 9 contains nuclide concentrations for 1/2 rod insertion, and zone 10 contains nuclide concentrations for 3/4 rod insertion. These nuclide concentrations are shown in Figure 6 for the control rod nuclides MAT40, MAT50, MAT60, MAT112, MAT176, MAT224, and MAT352.

A description of the control rod positioning as specified by the RODINS record in file CONTRL and the RODSET file shown in Figure 5 follows with specific references to the six accesses of the control rod positioning code RODMOD.

- 1) The first access of RODMOD before any neutronics calculations are made is to cause full rod insertion condition in control rod zones 13 and 14. This is done by using the first NSRPS set of data which specifies NOP = 0. The initial nuclide concentrations in the shutdown zone specify the all rod out condition and the initial nuclide concentrations in zone 12 specify full rod insertion.
- 2) The second access specifies one material interchange (rod withdrawal) for one set of zones 12, 10, 9, 8, 7 which results in zone 12 containing 3/4 rod insertion, zone 10 containing 1/2 rod insertion, zone 9 containing 1/4 rod insertion, and zone 8 containing all rod out. The concentration of the rod nuclides in zones 13 and 14 are changed by "fractional" rod insertion (typically used for two-dimensional calculations), resulting in 1/2 rod insertion for zone 13 and 3/4 rod insertion for zone 14. The second and third NSRPS sets of data are used to accomplish the positioning specifying NOP = 1 and NOP = 2.

- 3) The third, fourth and fifth accesses of RODMOD are similar to the second one resulting in 1/2, 1/4, and 0 rod insertion in zone 12; 1/4, 0, and 0 for zone 13; and 1/2, 1/4, and 0 for zone 14.
- 4) The sixth access specifies full rod insertion in zones 12 through 14 (as was done in the first access), except using point 6 in the history ($IX(10) = 6$) and full insertion of the shutdown rod zone 11.
- 5) The last access of RODMOD retrieves the nuclide concentrations as they existed prior to the shutdown rod insertion. This results in the rod zones 11, 12, 13, and 14 containing the same nuclide concentration as the first access, since the control rods were then fully inserted. (The result of this action is that without exposure calculations the first and last neutronics problems are identical. If the shutdown insertion and worth calculation had been done before the end of the fueling cycle, or perhaps even at the end, then likely option $IX(11)$ would have been made 2 on the previous access for the shutdown insertion state, instead of 1, to store the data for recovery at the desired state of insertion.)

3. Problem 3

The third sample problem is a thermal reactor problem with two sets of control rods. Referring to the mesh edit in Figure 6 (page 97), zones 6 through 10 and zone 16 comprise the first set of rod zones. The second set of rod zones is 19 through 24, with zones 19 through 22 initially designated as "black absorber" zones, and zone 23 initially containing follower material. As shown in the file RODSET, the rod nuclides are defined as ROD1 and ROD3, and the follower nuclides are ROD2 and ROD4.

The following describes the actions taken by the module accesses after the necessary data files have been generated with input processors (and the GRUPXS file generated):

- 1) Full rod insertion in zones 6 through 10, without applying black absorber specifications (causes a warning message because there are black zones).
- 2) Criticality search flux calculation to adjust the fuel loading.
- 3) Exposure.

- 4) Withdraw rods in first set 2 positions and second set 1 position.
- 5) Flux calculation, determines k_{eff} .
- 6) Exposure.
- 7) Further rod withdrawal, 2 positions for the first set, 1 position for the second set.
- 8) Flux calculation, determines k_{eff} .
- 9) Exposure.
- 10) Rod withdrawal, 1 position for set 1 and 2 positions for set 2 resulting in the condition of all rods out of the core.
- 11) Flux calculation, determines k_{eff} .
- 12) Recovery of initial condition of both sets of rods inserted.
- 13) Flux calculation, determines k_{eff} , solves the adjoint problem and produces perturbation integrals.
- 14) Reaction rate calculation.
- 15) Refueling is simulated by specifying new nuclide concentrations using the module DENMAN.
- 16) Criticality search flux calculation to adjust the fuel loading.
- 17) Exposure through the second cycle is effected with successive calculations involving access to BURNER, RODMOD, and VENTURE.
- 18) Flux calculation after recovery of initial rod insertion data.

The automated procedure was specified ($IX(10) = 0$ in RODINS) for the first cycle for each access of the rod positioning code, except the first and the last. Rod withdrawal with this automated procedure uses the time after each exposure step relative to the cycle time to determine the action of repositioning to apply. Note that as the rods are repositioned, follower material comes into the zones from which rods have been removed. During the operating history, exposure of the rod nuclide ROD3 and followers ROD2 and ROD4 is accounted for. (Exposure effects could not be determined when the black absorber approximation is used (applied on a macroscopic basis), nor

with fractional insertion.) For the second cycle after refueling, the critical state is established by adjusting the fuel loading. Then the automated procedure is used to effect rod insertion based on access count (not based on fractional cycle time as was done for the first cycle).

A summary of the results for the reactor history is shown in Table 1.

Table 1. Summary of the Reactor History for Sample Problem 3

Point in Time (Days)	Reference Control Rod Condition	Peak Power Density (w_{th}/cc)	Fissile Inventory (kgm)	Reaction Rate Conversion Ratio (Uncorrected)	k_{eff}
0	Inserted	7.473	60.88	.3762	1.0
100	Partial Insertion	8.162	56.81	.3883	.9876
200	Partial Insertion	6.626	52.83	.3980	1.0100
300	Removed	6.287	48.95	.4130	1.0029
300	Inserted	7.199	48.95	.4443	.8771
300	(Refueling Simulated)	7.233	61.01	.3783	1.0
385	Partial Insertion	9.240	60.53	.3926	.9863
470	Partial Insertion	8.308	55.89	.4067	.9876
555	Removed	6.911	48.22	.4168	.9936
555	Inserted	7.940	48.22	.4483	.8781

FIGURE 5. JOB CONTROL INSTRUCTIONS FOR SAMPLE PROBLEMS.

```

//ESPRID JOB (CHARG), 'USER ADDRESS - NAME',
//MSGLEVEL=(1,1)
//*CLASS CPU95=16R, REGION=0450K, IO=05C, LINES=19, CAPDS=00
//STEP EXEC BOLDVENT,
// N2=20, N3=20, N4=20, N5=20, N6=20, N7=20, N8=20, N9=20, N10=20, N11=20,
// N12=20, N13=20, N14=20, N15=20, N16=20,
// GOSIZE=450K
//GC.SYSIN DD *
=CONTROL1
BCINOD SAMPLE PROBLEM 1. ROD POSITIONING ONLY - NO NEUTRONICS.
10000 0 1
1 2 12 2 12 2 12 2 12 2 12 2 12 0
END
*****INPUT PROCESSOR*****
CV RODSET
1C
3 3 4 36 2 5 0 3R 0 3 0 9R
2C
*RODS1 RODS2 RODS3 *
*POLL1 POLL2 POLL3 *
1.0 2.0 3.0
10.0 20.0 30.0
3C
2 3 4 5 6 7 8 9 10 0
12 13 14 15 16 17 18 19 20 0
22 23 24 25 26 27 28 29 30 0
31 1 11 21 31 0
4C
0.0 5P 0 0 10R
5C
0 4R 0 4R 5 16 27 0 0 4R 0 4R
6C
0.0 5P 1 0 10R
5E
4 2 6 1 5 7 3 1 0 4R -2 -2 -2 1 -3 -2 -2 1
CV NDISRP
1C
9 4 3 9 31 C
2C
*ALIGN STROU FUEL1 RODS1 RODS2 RODS3 POLL1 POLL2 POLL3 NUC1 *
*NUC2 NUC3 NUC4 NUC5 NUC6 NUC7 NUC8 NUC9 *
0.0 18R 0 9R 3 0 3R 3 0 3R 3 0 3R 3 0 3R 3 2 1 4 7 1 5
8 1 6 9 1 3 2 1 0 6R 3 0 2R 1 0 2R 2 0 2R 3 0 3R 1
0 4R 2 0 3 0 4R 1 0 2R 2
3R
9.0 1.0 9R 9.0 1.0 9R 9.0 1.0 9R 9.0 1.0 31R
1 2 9R 1 3 9R 1 4 9R 1
OV ZWATDW
1D
10.0 1 31 3 1
2C
1.0 10.0 0.0 28R 11.0 110.0 0.0 28R 21.0 210.0 0.0 28R 31.0
310.0 0.0

```

(CONT)

```

CV GEODST
1E 1 6 31 53 4 7 9 1 7 9
    1 2 4B 0 28 1 6 1 0 25
    1 0 5B
3E /
0.0 1.00000D 00 2.00000D 00 3.00000D 00 4.00000D 00
5.00000D 00 6.00000D 00 7.00000D 00 0.0 1.00000D 00
2.00000D 00 3.00000D 00 4.00000D 00 5.00000D 00 6.00000D 00
7.00000D 00 8.00000D 00 9.00000D 00
1 16B
5D 1.00000E 00 63B 0.0 4.69200E-01 4E
1.00000E 30 2E 4.69200E-01
    1 2 9B 1 3 9B 1 2 9B
    1 2B 2 11 12 21 27 31 1 3
    11 13 21 23 31 1 4 11 14 21
    24 31 1 5 11 15 21 25 31 1
    6 11 16 21 26 31 1 7 11 17
    21 27 31 1 8 11 12 21 28 31
    1 9 11 19 21 29 31 1 10 11
    20 21 30 31
7E 1 2 3 4 5 6 7 8 9
    10 11 12 13 14 15 16 17 18 19
    20 21 22 23 24 25 26 27 28 29
    30 31 32 33 34 35 36 37 38 39
    40 41 42 43 44 45 46 47 48 49
    50 51 52 53 54 55 56 57 58 59
    60 61 62 63
STOP
ENC
CUTLIN
FCEINS 0 2 0 12
0.0 0.0
C C 1 0 0 0 0 0 0 -2 0 0
BLANK
END
CUTLIN
RODINS 0 2 0 12
C.C 0.0
0 0 1 0 0 0 0 2 0 1 0 0
BLANK
ENC
CUTLIN
FCEINS 0 2 0 12
0.0 0.0
0 0 1 0 0 0 0 2 0 2 0 0
BLANK
END
CUTLIN
RODINS 0 2 0 12
0.0 0.0
0 0 1 0 0 0 0 1 0 3 0 0
BLANK
ENC

```

(CONT)

```

FUTLIN
FODINS      0  2  0 12
C.L.C      0.0
  0  0  1  0  0  0  0  2  0  0  0  0
ELANK
END
FUTLIN
FODINS      0  2  0 12
C.L.C      0.0
  0  0  1  0  0  0  0  2  0  5  0  0
ELANK
END

```

```

=CONTROL 1
FODMOD SAMPLE PROBLEM 2  2-D ROD POSITIONING AND FRACTIONAL INSERTION.
C06000
  1  2  6  2  2 12  7  2 12  7 -3  6  9  0

```

```

END
INPUT PROCESSOR DATA FOLLOWS

```

```

OV FODSET

```

```

1D
  7  7  3 10  3  6  0  0  0  0  0  1  0 8R

```

```

2C
  *MAT 40*  *MAT 50*  *MAT 60*  *MAT112*  *MAT176*  *MAT220*  *MAT352*
  *MAT 40*  *MAT 50*  *MAT 60*  *MAT112*  *MAT176*  *MAT220*  *MAT352*
  7.64E-3  1.147E-2  4.78E-3  1.453E-2  6.26E-3  0.0  0.0
  0.0  0.0  0.0  0.0  0.0  1.832E-2  6.26E-3

```

```

3D
  12 10  9  8  7  0  13  0  14  0

```

```

4E
  0.0 6P  0  0 10R

```

```

5E
  0 13 14  0 12R  12 13 14

```

```

6E
  0.0 6R  1  0 10R

```

```

7E
  0 3R  1 0 0  1 0 0  1 0 0  1 0 0  0 3R

```

```

8E
  0.0 6R  2  0 10R

```

```

9E
  0 2R  -1 500 750  -1 250 500  -1 0 250  -1 0 0  0 3R

```

```

ED
  11

```

```

9E
  7.64E-3  1.147E-2  4.78E-3  1.453E-2  6.26E-3  0.0  0.0

```

```

OV ISOTXS  ***CROSS SECTIONS***

```

```

1D  0  30  0  0  1  1  1  0

```

```

2D * LARGE CORE X-SECTIONS

```

```

*
  6HHAT 10  6HHAT 11  6HHAT 12  6HHAT 13  6HHAT 14  6HHAT 15
  6HHAT 16  6HHAT 28  6HHAT 40  6HHAT 44  6HHAT 50  6HHAT 56
  6HHAT 60  6HHAT 88  6HHAT112  6HHAT135  6HHAT138  6HHAT139

```

(CONT)

6HHA1140	6HHA1141	6HHA1142	6HHA1176	6HHA1224	6HHA1238
6HHA1239	6HHA1240	6HHA1242	6HHA1335	6HHA1338	6HHA1352
7.59691E-01	2.37146E-01	3.12704E-03	3.56784E-05		
1.87602E+09	5.56731E+08	1.58760E+08	4.29811E+07	1.64900E+07	
9.20800E+05	4.08700E+04	2.03500E+03	1.00000E-05		
0 6	12 18	24 30	36 42	48 54	60 66
72 78	84 90	96 102	108 114	120 126	132 138
144 150	156 162	168 174			
4D 6HCR	6HENDFB3	6H 2400			
5.19000E+01	0.	0.	7.54100E+02	0.	
2.98000E-03					
5 0	0 0	0 0	0 0	0 0	0 0
1 1	2 3	2 1	1 1	1 1	
5D 2.33235E+00	3.54714E+00	7.75291E+00	5.44459E+00	4.50048E-03	
6.33641E-03	4.11306E-02	1.05545E-01			
7D 1.88266E+00					
7D 3.46467E+00	4.44267E-01				
7D 7.67668E+00	7.61311E-02	9.15585E-04			
7D 5.33905E+00	3.50577E-02				
4D 6HFE	6HENDFB3	6H 2600			
5.58000E+01	0.	0.	7.54100E+02	0.	
6.20000E-03					
5 0	0 0	0 1	0 0	0 0	0 0
1 1	2 3	2 1	1 1	1 1	
5D 2.24952E+00	3.15437E+00	7.30377E+00	8.94202E+00	7.50050E-03	
6.25554E-03	1.36236E-02	9.30693E-02	1.03797E-04	0.	
0.					
7D 1.86991E+00					
7D 3.10804E+00	3.62014E-01				
7D 7.25592E+00	4.40735E-02	4.20349E-03			
7D 8.84895E+00	3.42184E-02				
4D 6HFI	6HENDFB3	6H 2800			
5.87000E+01	0.	0.	7.54100E+02	0.	
5.26000E-03					
5 0	0 0	0 0	0 0	0 0	0 0
1 1	2 3	2 1	1 1	1 1	
5D 2.54869E+00	4.75729E+00	1.90691E+01	1.68520E+01	8.64997E-02	
1.22271E-02	4.95660E-02	2.60255E-02			
7D 2.10394E+00					
7D 4.62772E+00	3.57451E-01				
7D 1.89444E+01	5.73395E-02	7.94368E-04			
7D 1.68260E+01	7.11062E-02				
4D 6HFO	6HENDFB3	6H 4200			
9.54000E+01	0.	0.	7.54100E+02	0.	
2.60000E-04					
5 0	0 0	0 1	0 0	0 0	0 0
1 1	2 3	2 1	1 1	1 1	
5D 3.54254E+00	6.90495E+00	8.38855E+00	1.18955E+01	1.81308E-02	
5.51863E-02	3.04344E-01	1.33673E+00	2.77422E-03	0.	
0.					
7D 2.65566E+00					
7D 6.79867E+00	8.62723E-01				
7D 8.05587E+00	4.70868E-02	2.80074E-03			
7D 1.05588E+01	2.83314E-02				

(CONT)

```

4D 6HNA      6HENDFB3  6H  1100
2.20000E+01  0.      0.      7.33000E+02  G.
8.00000E-03
   6   0   0   0   1   0   0   0   1   0   0
   1   1   2   3   2   1   1   1   1   1   1
5D  1.88299E+00  3.790E3E+C0  5.69793E+00  5.06238E+00  2.54849E-03
9.15280E-04  4.73260E-03  1.23878E-02  2.87633E-06  C.
0.      0.
7D  1.46E73E+00
7C  3.68117E+00  4.13709E-01
7E  5.43E19E+00  1.08752E-C1  4.49804E-07
7D  5.05000E+00  2.55000E-01
4C 6HFP      6HENDFB3  6H  9999
1.00000E+02  0.      C.      7.54100E+02  C.
2.40000E-04
   4   0   0   0   0   0   0   0   0   1   0   0
   1   1   2   3   2   1   1   1   1   1   1   1
5D  7.61564E+00  1.18709E+01  1.63518E+01  2.32574E+C1  5.17349E-02
2.25078E-01  8.72613E-01  3.62165E+00
7C  5.69712E+00
7D  1.15739E+01  1.85852E+00
7C  1.54380E+01  7.18E14E-C2  8.26870E-03
7C  7.96357E+01  4.11351E-C2
4C 6 0      6HENDFB3  6H  80
1.60000E+01  0.      C.      7.54100E+02  C.
0.
   0   0   0   0   0   0   0   0   0   1   0   0
   1   1   2   3   2   1   1   1   1   1   1   1
5D  1.84106E+00  3.37143E+00  3.55431E+00  3.54834E+00  7.60674E-03
7.03775E-08  2.46771E-07  9.11535E-07
7C  1.25201E+00
7D  3.24373E+00  5.81445E-C1
7D  3.50740E+00  1.27702E-C1  0.
7C  3.54834E+00  4.69054E-02
4C 6HNA      6HENDFB3  6H  1100
2.29000E+01  0.      0.      7.33000E+02  0.
2.40000E-04
   6   0   0   0   1   0   0   0   1   0   0
   1   1   2   3   2   1   1   1   1   1   1
5D  1.88126E+00  3.78723E+00  5.61962E+00  5.15836E+00  2.58715E-03
8.59325E-04  4.59006E-03  1.26002E-02  2.91533E-06  C.
0.      0.
7D  1.48151E+00
7C  3.68432E+00  3.97157E-01
7D  5.37318E+00  1.02011E-01  4.56092E-07
7D  5.14576E+00  2.41849E-01
4C 6H-10     6HENDFB3  6H  510
1.00000E+01  0.      C.      7.33000E+02  0.
7.64000E-03
   7   0   0   0   0   0   0   0   1   0   0
   1   1   2   3   2   1   1   1   1   1   1
5D  1.77863E+00  4.33870E+00  6.61554E+00  1.98988E+C1  3.91142E-01
1.48332E+00  4.80291E+00  1.80004E+01
7D  9.49931E-01

```

(CONT)

```

7D 2.72928E+00 4.37556E-C1
7D 1.79179E+00 1.26102E-01 1.91998E-06
7D 1.89836E+00 2.08453E-02
4D 6HFE 6HENDFB3 6H 2600
5.5E000E+01 0. 0. 7.54100E+02 C.
4.04000E-03
5 0 0 0 0 0 0 0 C 1 0 0
1 1 2 3 2 1 1 1
5E 2.26052E+00 3.3E777E+00 7.85045E+00 9.35125E+00 7.36585E-03
6.45551E-03 1.38873E-02 9.58798E-02 1.00434E-04 0.
0. 0.
7D 1.83629E+00
7E 3.32210E+00 4.131C3E-01
7D 7.79560E+00 5.92151E-02 3.86137E-03
7D 9.25537E+00 4.09641E-02
4D 6H-11 6HENDFB3 6H 511
1.10000E+01 0. 0. 7.33000E+02 0.
1.14700E-02
7 0 0 0 0 0 0 0 C 1 0 0
1 1 2 3 2 1 1 1
5E 1.73615E+00 3.42551E+00 4.78647E+00 4.72473E+00 5.57323E-05
3.05045E-06 1.13341E-04 2.38576E-05
7E 1.23197E+00
7D 3.20508E+00 5.04120E-01
7E 4.74088E+00 2.20429E-01 3.36695E-07
7E 4.72471E+00 4.54811E-02
4D 6HWA 6HENDFB3 6H 1100
2.29000E+01 0. 0. 7.33000E+02 0.
6.07000E-03
6 0 0 0 0 1 0 0 C 1 0 0
1 1 2 3 2 1 1 1
5E 1.86462E+00 3.85E74E+00 6.54646E+00 4.61370E+00 2.50659E-03
1.02756E-03 5.91149E-03 1.15346E-02 2.78311E-06 0.
0. 0.
7D 1.33353E+00
7E 3.71173E+00 5.28590E-C1
7D 6.22384E+00 1.45983E-01 4.36968E-07
7D 4.60216E+00 3.16701E-01
4E 6HFP 6HENDFB3 6H 600
1.20000E+01 0. 0. 7.33040E+02 0.
4.78000E-03
7 0 0 0 0 0 0 0 C 1 0 0
1 1 2 3 2 1 1 1
5E 1.74016E+00 3.52596E+00 4.39388E+00 4.47585E+00 8.434P1E-04
0. 1.72470E-07 1.62503E-05
7D 1.28945E+00
7D 3.23175E+00 4.49861E-01
7E 4.35264E+00 1.94213E-C1 2.57901E-08
7D 4.47583E+00 4.124C8E-02
4D 6HFE 6HENDFB3 6H 2600
5.58000E+01 0. 0. 7.59100E+02 0.
3.53700E-02
5 0 0 0 1 0 0 0 C 1 0 0
1 1 2 3 2 1 1 1

```

(CONT)

5D 2.22801E+00 2.84999E+00 5.92953E+00 9.86922E+00 5.61198E-03
 6.33207E-03 1.17788E-02 6.22297E-02 6.66970E-05 C.
 0. 0.
 7L 1.52382E+00
 7D 2.77493E+00 6.95159E-01
 7E 5.83354E+00 6.87290E-02 2.98328E-03
 7D 9.80679E+00 8.42155E-02
 4C 6ENA 6HENDFB3 6H 1100
 2.29000E+01 0. C. 7.33006E+02 0.
 1.4530CF-02
 6 0 0 C 0 1 0 0 0 0 0
 1 1 2 3 2 1 1 1 1
 5D 1.85180E+00 3.71570E+00 4.83263E+00 5.49786E+00 2.58604E-03
 6.45660E-04 3.31712E-03 1.33330E-02 2.75148E-06 C.
 0. 0.
 7D 1.46410E+00
 7E 3.61371E+00 4.25317E-01
 7D 4.68210E+00 1.01135E-01 4.28348E-07
 7D 5.48453E+00 1.47209E-01
 4C 6HU-235 6HENDFB3 6H 9235
 2.35000E+02 0. C. 1.29240E+03 0.
 1.90000E-05
 1 0 1 0 0 1 0 0 0 1 0 0
 1 1 2 3 3 1 1 1 1
 5D 4.66474E+00 8.29209E+00 1.44278E+01 2.47463E+01 5.83333E-02
 3.51060E-01 1.04574E+00 4.07153E+00 1.24073E+00 1.46579E+00
 2.89339E+00 9.07953E+00 2.68931E+00 2.44889E+00 2.42468E+00
 2.42311E+00 1.08886E-02 C. 0. 0.
 7D 2.66045E+00
 7E 6.42257E+00 7.31972E-01
 7D 1.04759E+01 5.26434E-02 4.14506E-03
 7D 1.15952E+01 1.28007E-02 3.23548E-05
 4C 6HU-238 6HENDFB3 6H 9238
 2.38000E+02 0. C. 1.29240E+03 0.
 7.69000E-03
 2 0 1 0 0 1 0 0 0 1 0 0
 1 1 2 3 3 1 1 1 1
 5D 4.72115E+00 8.54519E+00 1.33366E+01 1.25213E+01 6.39481E-02
 1.79014E-01 6.16305E-01 1.41179E+00 3.70183E-01 3.48353E-04
 4.84479E-05 3.93085E-04 2.77311E+00 2.41872E+00 2.32700E+00
 2.32700E+00 1.87891E-02 C. 0. 0.
 7D 2.58307E+00
 7E 8.3043E+00 1.71294E+00
 7D 1.27041E+01 6.14318E-02 9.84888E-03
 7D 1.11091E+01 1.61137E-02 8.48086E-05
 4C 6HPU-239 6HENDFB3 6H 9439
 2.39000E+02 0. C. 1.29240E+03 0.
 7.60000E-04
 1 0 1 0 0 1 0 0 0 1 0 0
 1 1 2 3 3 1 1 1 1
 5D 4.69324E+00 8.19171E+00 1.39951E+01 2.30947E+01 1.16223E-02
 2.04450E-01 1.05720E+00 4.91931E+00 1.89780E+00 1.59197E+00
 1.96675E+00 5.74588E+00 3.18890E+00 2.91595E+00 2.88218E+00
 2.88011E+00 2.32297E-03 C. 0. 0.

(CONT)

7D 1.95618E+00
 7D 6.34695E+00 7.84199E-01
 7D 1.09426E+01 4.83271E-02 5.76564E-03
 7D 1.24295E+01 2.85659E-02 1.81555E-05
 4D 6HPU-240 6HENDFB3 6H 9440
 2.40000E+02 0. 0. 1.29240E+03 0.
 2.90000E-04
 2 0 1 0 0 1 0 0 0 1 0 0
 1 1 2 3 3 1 1 1 1
 5D 4.75812E+00 8.03104E+00 1.38680E+01 2.21745E+01 6.04094E-02
 2.23054E-01 7.36510E-01 3.41123E+00 1.50403E+00 2.51700E-01
 1.00587E-01 2.05348E-01 3.11872E+00 2.94155E+00 2.89171E+00
 2.89012E+00 6.33798E-03 0. 0. 0.
 7D 2.49341E+00
 7D 7.45556E+00 7.03193E-01
 7D 1.30158E+01 9.63796E-02 3.42027E-03
 7D 1.85580E+01 1.50681E-02 3.51853E-04
 4D 6HPU-241 6HENDFB3 6H 9441
 2.41000E+02 0. 0. 1.29240E+03 0.
 1.40000E-04
 1 0 1 0 0 1 0 0 0 1 0 0
 1 1 2 3 3 1 1 1 1
 5D 4.65262E+00 8.69088E+00 1.47979E+01 2.63804E+01 8.71624E-02
 2.71861E-01 7.77532E-01 2.95514E+00 1.64303E+00 1.52557E+00
 3.36957E+00 1.11019E+01 3.25761E+00 2.97067E+00 2.53821E+00
 2.93614E+00 1.75066E-02 0. 0. 0.
 7D 2.14922E+00
 7D 6.40867E+00 7.83679E-01
 7D 1.06377E+01 8.46050E-02 7.03386E-03
 7D 1.23233E+01 1.30478E-02 1.79024E-04
 4D 6HPU-242 6HENDFB3 6H 9442
 2.42000E+02 0. 0. 1.29240E+03 0.
 8.00000E-05
 0 0 1 0 0 1 0 0 0 1 0 0
 1 1 2 3 3 1 1 1 1
 5D 4.43459E+00 7.85891E+00 1.61521E+01 3.33309E+01 3.86613E-02
 1.57409E-01 6.30532E-01 3.48330E+00 1.46922E+00 1.60931E-01
 3.75722E-02 0. 3.15128E+00 2.89001E+00 2.81119E+00
 0. 7.01546E-03 0. 0. 0.
 7D 2.32603E+00
 7D 7.46940E+00 6.02578E-01
 7D 1.54570E+01 7.11672E-02 4.71878E-03
 7D 2.98476E+01 2.69626E-02 2.82795E-06
 4D 6HFE 6HENDFB3 6H 2600
 5.58000E+01 0. 0. 7.54100E+02 0.
 6.26000E-03
 5 0 0 0 1 0 0 0 1 0 0
 1 1 2 3 1 1 1 1
 5D 2.25038E+00 3.16307E+00 7.39224E+00 8.74893E+00 7.13862E-03
 6.22619E-03 1.36146E-02 9.10613E-02 9.92917E-05 0.
 0.
 7D 1.86546E+00
 7D 3.11507E+00 3.74033E-01
 7D 7.35902E+00 4.17796E-02 3.84292E-03

(CONT)

```

7D 8.65787E+00 1.96008E-02 0.
4D 6HNA 6HENDFB3 6H 1100
2 29000E+01 0. 0. 7.33000E+02 1.83200E-02
6.26000E-02
  6 0 0 0 0 1 0 0 0 1 0 0
  1 1 2 3 3 1 1 1 1
5D 1.91211E+00 3.66470E+00 4.87979E+00 4.53246E+00 2.34797E-03
8.00667E-04 3.64182E-03 1.17056E-02 2.67263E-06 0.
0.
7E 1.46651E+00
7D 3.55405E+00 4.43247E-01
7E 4.64145E+00 1.09849E-01 4.16718E-07
7D 4.52075E+00 2.34691E-01 0.
4D 6HPU-239 6HENDFB3 6H 9238
2.38000E+02 0. 0. 1.29240E+03
7.23000E-03
  2 0 1 0 0 1 0 0 0 1 0 0
  1 1 2 3 3 1 1 1 1
5D 4.71790E+00 8.47037E+00 1.33625E+01 1.26739E+01 6.37775E-02
1.76722E-01 6.14084E-01 1.43077E+00 3.70720E-01 3.59312E-04
4.90293E-05 3.81712E-04 2.77541E+00 2.41907E+00 2.32700E+00
2.32700E+00 1.90889E-02 0. 0. 0.
7E 2.58424E+00
7D 8.23485E+00 1.70837E+00
7E 1.27330E+01 5.83547E-02 9.89101E-03
7E 1.12427E+01 1.53333E-02 7.97368E-05
4D 6HPU-239 6HENDFB3 6H 9439
2.39000E+02 0. 0. 1.29240E+03 0.
1.01000E-02
  1 0 1 0 0 1 0 0 0 1 0 0
  1 1 2 3 3 1 1 1 1
5D 4.69169E+00 8.11945E+00 1.39570E+01 2.24568E+01 1.15952E-02
2.01419E-01 1.04271E+00 4.73989E+00 1.89707E+00 1.59081E+00
1.95960E+00 5.52732E+00 3.19035E+00 2.91682E+00 2.88221E+00
2.88013E+00 2.36028E-03 0. 0. 2.98023E-07
7E 1.95608E+00
7D 6.28148E+00 7.83536E-01
7E 1.09272E+01 4.57164E-02 5.76496E-03
7E 1.21896E+01 2.75043E-02 1.72659E-05
4D 6HPU-240 6HENDFB3 6H 9440
2.40000E+02 0. 0. 1.29240E+03 0.
4.10000E-04
  2 0 1 0 0 1 0 0 0 1 0 0
  1 1 2 3 3 1 1 1 1
5D 4.75598E+00 7.95748E+00 1.38110E+01 2.15603E+01 6.02559E-02
2.20485E-01 7.29371E-01 3.26456E+00 1.50417E+00 2.57590E-01
1.00331E-01 2.04446E-01 3.11971E+00 2.94206E+00 2.89173E+00
2.89013E+00 6.43E41E-03 0. 0. 0.
7E 2.49128E+00
7D 7.38749E+00 7.03257E-01
7E 1.29671E+01 9.15838E-02 3.45118E-03
7E 1.80913E+01 1.41961E-02 3.30811E-04
4D 6HPU-242 6HENDFB3 6H 9442
2.42000E+02 0. 0. 1.29240E+03 0.

```

(CONT)

```

1.12000E-04
  0 0 1 0 0 1 0 0 0 1 0 0
  1 1 2 3 3 1 1 1 1 1 1 1
5D 4.43405E+00 7.78332E+00 1.60967E+01 3.30550E+01 3.85623E-02
1.55429E-01 6.24791E-01 3.39261E+00 1.47067E+00 1.65483E-01
3.79382E-02 0. 3.15289E+00 2.89051E+00 2.81120E+00
0. 7.12688E-C3 0. 0. 0.
7D 2.32653E+00
7E 7.39477E+00 6.00700E-C1
7F 1.54085E+01 6.76346E-C2 4.71148E-03
7D 2.96624E+01 2.54621E-02 2.65883E-06
4C 6HU-235 6HENDFB3 6H 5235
2.35000E+02 0. 0. 1.29240E+03 0.
4.20000E-05
  1 0 1 0 0 1 0 0 0 1 0 0
  1 1 2 3 3 1 1 1 1 1 1 1
5D 4.68293E+00 8.63408E+00 1.46030E+01 2.79653E+01 5.75815E-02
3.86684E-01 1.07410E+00 5.12103E+00 1.24297E+00 1.50987E+00
2.97315E+00 1.11518E+01 2.68902E+00 2.44610E+00 2.42457E+00
2.42308E+00 1.07322E-C2 0. 0. 0.
7D 2.65663E+00
7E 5.67934E+00 7.32276E-C1
7D 1.05406E+01 6.41510E-02 4.20327E-03
7D 1.16524E+01 1.51799E-02 4.20589E-05
4C 6HU-238 6HENDFB3 6H 9238
2.38000E+02 0. 0. 1.29240E+03 0.
1.40100E-02
  2 0 1 0 0 1 0 0 0 1 0 0
  1 1 2 3 3 1 1 1 1 1 1 1
5D 4.71980E+00 8.85015E+00 1.30441E+01 1.13609E+01 6.28782E-02
1.90045E-01 6.14909E-01 1.22303E+00 3.78375E-01 3.09668E-04
4.63034E-05 3.82781E-C4 2.76659E+00 2.41733E+00 2.32700E+00
2.32700E+00 1.85889E-02 0. 0. 0.
7D 2.54269E+00
7E 8.58263E+00 1.74491E+00
7D 1.24115E+01 7.70606E-C2 9.52718E-03
7D 1.01375E+01 1.76742E-02 1.10245E-04
4C 6HPE 6HENDFB3 6H 2600
5.58000E+01 0. 0. 7.54100E+02 0.
6.26000E-03
  5 0 0 0 0 1 0 0 0 1 0 0
  1 1 2 3 3 1 1 1 1 1 1 1
5D 2.24227E+00 3.07496E+00 6.49763E+00 9.98309E+00 7.11246E-03
6.23925E-03 1.32693E-02 7.89989E-02 9.64467E-05 0.
0. 0.
7D 1.85187E+00
7E 3.02225E+00 3.79213E-01
7E 6.44904E+00 4.64676E-C2 4.16895E-03
7D 9.00409E+00 3.53218E-02 0.
STOP
END

```

(CONT)

DUTLIN
 MCPINS 0 0 0 8
 0 0 0 1 0 0 1 2
 ELANK
 END
 EVENTR
 CC1

3.085 +9 1.0 1.547 -3

0.00 -0
 1 0 0 0
 1 1 0 0 1
 CC3 0 20 1
 9 1 2 1 2 1 1
 5
 004
 2 8.019395 14 56.13576 8 32.07758 10 40.09698 16 64.15516
 1 8.019395 7 56.13576 4 32.07758 5 40.09698 8 64.15516

005
 1 1 2 2 4
 1 1 2 2 4
 2 2 2 3 5
 2 2 3 4 5
 4 4 5 5 5

006
 2
 16 16 8 8 1 1
 1
 17 22 1 1 1 1 17 23 2 3 1 1 17 22 4 4 1 1
 17 21 5 5 1 1 17 17 6 6 1 1 1 10 9 10 1 1
 1 9 11 11 1 1 3 5 12 12 1 1 11 11 9 9 1 1
 24 24 2 2 1 1
 3
 25 43 1 1 1 1 34 42 2 2 1 1 33 41 3 3 1 1
 32 40 4 4 1 1 31 39 5 5 1 1 3 32 6 6 1 1
 29 37 7 7 1 1 28 36 8 8 1 1 1 16 18 18 1 1
 1 13 19 19 1 1 1 9 20 20 1 1 1 5 21 21 1 1
 1 1 22 22 1 1 24 24 9 9 1 1 23 24 10 10 1 1
 22 24 11 11 1 1 18 24 12 12 1 1 35 35 9 9 1 1
 16 27 14 14 1 1 12 16 15 15 1 1 8 16 16 16 1 1
 4 16 17 17 1 1 25 28 13 13 1 1 17 17 18 18 1 1

4
 17 25 19 19 1 1 17 21 20 20 1 1 17 17 21 21 1 1
 34 39 11 11 1 1 30 38 12 12 1 1 18 29 18 18 1 1
 36 41 9 9 1 1 35 40 10 10 1 1 35 37 13 13 1 1
 35 36 14 14 1 1 24 35 15 15 1 1 23 34 16 16 1 1
 22 33 17 17 1 1
 5
 50 50 1 1 1 1 49 50 2 2 1 1 48 50 3 3 1 1
 47 50 4 4 1 1 46 50 5 5 1 1 45 50 6 6 1 1
 44 50 7 7 1 1 43 50 8 8 1 1 42 50 9 9 1 1
 41 50 10 10 1 1 40 50 11 11 1 1 39 50 12 12 1 1
 38 50 13 13 1 1 37 50 14 14 1 1 36 50 15 15 1 1

(CONT)

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35 50 16 16 1 1 34 50 17 17 1 1 30 50 18 18 1 1
26 50 19 19 1 1 22 50 20 20 1 1 18 50 21 21 1 1
18 50 22 22 1 1 10 50 23 23 1 1 6 50 24 24 1 1
2 50 25 25 1 1
11
1 1 1 1 1 1
12
1 2 6 6 1 1 1 1 7 7 1 1 11 13 1 1 1 1
13
23 25 1 1 1 1 1 2 12 12 1 1 1 1 13 13 1 1
18
18 16 7 7 1 1 13 15 8 8 1 1

```

0

012

0

```

1 1 1 1 1.0
2 2 1 2 1.0
3 3 1 3 1.0
4 4 1 4 1.0
5 5 1 5 1.0
6 10 1 6 1.0

```

013

020

030

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MAT 10MAT 11MAT 12MAT 13MAT 14MAT 15MAT 16MAT 28MAT 40MAT 44MAT 50MAT 56
MAT 60MAT 88MAT 112MAT 135MAT 138MAT 139MAT 140MAT 141MAT 142MAT 176MAT 224MAT 238
MAT 239MAT 240MAT 242MAT 335MAT 338MAT 352

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020

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1 1
MAT139 7.6 -4MAT140 2.9 -4MAT141 1.4 -4MAT142 8. -5
MAT138 7.69 -3MAT135 1.9 -5MAT 10 2.98 -3MAT 11 6.26 -3
MAT 12 5.26 -3MAT 13 2.6 -4MAT 14 8.08 -3MAT 16 1.804 -2
MAT 15 2.4 -4
2 2
MAT239 10.1 -4MAT240 4.1 -4MAT141 1.9 -4MAT242 1.12 -4
MAT238 7.23 -3MAT135 1.8 -5MAT 10 2.98 -3MAT 11 6.26 -3
MAT 12 5.26 -3MAT 13 2.6 -4MAT 28 8.08 -3MAT 16 1.804 -2
MAT 15 2.4 -4
3 3
MAT338 1.401 -2MAT335 4.2 -5MAT 10 1.73 -3MAT 44 4.04 -3
MAT 12 3.84 -3MAT 13 1.9 -4MAT 56 6.07 -3MAT 16 2.802 -2
4 4
MAT 10 1.516 -2MAT 88 3.537 -2MAT 12 3.368 -2MAT 13 1.47 -3
5 5
MAT 10 0.0
6 6
MAT 10 0.0
7 7
MAT176 0.0 MAT352 6.26 -3MAT112 0.0 MAT224 1.832 -2

```

(CONT)

MAT 40 0.0										MAT 50 0.0										MAT 60 0.0									
MAT 176 1.565										-3MAT 352 4.695										-3MAT 112 3.6325									
MAT 40 1.91										-3MAT 50 2.8675										-3MAT 60 1.195									
MAT 176 3.13										-3MAT 352 3.13										-3MAT 112 7.265									
MAT 40 3.82										-3MAT 50 5.735										-3MAT 60 2.39									
MAT 176 4.695										-3MAT 352 1.565										-3MAT 112 1.08975									
MAT 40 5.73										-3MAT 50 8.6025										-3MAT 60 3.585									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 6.26									
MAT 13 2.6										-4MAT 112 0.0										MAT 224 1.832									
MAT 50 0.0										MAT 60 0.0										-3MAT 12 5.26									
MAT 10 2.98										-3MAT 176 6.26										-3MAT 352 0.0									
MAT 13 2.6										-4MAT 112 1.453										-2MAT 224 0.0									
MAT 50 1.147										-2MAT 60 4.78										-3MAT 12 5.26									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 0.0									
MAT 13 2.6										-4MAT 112 0.0										MAT 224 0.0									
MAT 50 0.0										MAT 60 0.0										MAT 12 5.26									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 0.0									
MAT 13 2.6										-4MAT 112 0.0										MAT 224 0.0									
MAT 50 0.0										MAT 60 0.0										MAT 12 5.26									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 0.0									
MAT 13 2.6										-4MAT 112 0.0										MAT 224 0.0									
MAT 50 0.0										MAT 60 0.0										MAT 12 5.26									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 0.0									
MAT 13 2.6										-4MAT 112 0.0										MAT 224 0.0									
MAT 50 0.0										MAT 60 0.0										MAT 12 5.26									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 0.0									
MAT 13 2.6										-4MAT 112 0.0										MAT 224 0.0									
MAT 50 0.0										MAT 60 0.0										MAT 12 5.26									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 0.0									
MAT 13 2.6										-4MAT 112 0.0										MAT 224 0.0									
MAT 50 0.0										MAT 60 0.0										MAT 12 5.26									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 0.0									
MAT 13 2.6										-4MAT 112 0.0										MAT 224 0.0									
MAT 50 0.0										MAT 60 0.0										MAT 12 5.26									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 0.0									
MAT 13 2.6										-4MAT 112 0.0										MAT 224 0.0									
MAT 50 0.0										MAT 60 0.0										MAT 12 5.26									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 0.0									
MAT 13 2.6										-4MAT 112 0.0										MAT 224 0.0									
MAT 50 0.0										MAT 60 0.0										MAT 12 5.26									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 0.0									
MAT 13 2.6										-4MAT 112 0.0										MAT 224 0.0									
MAT 50 0.0										MAT 60 0.0										MAT 12 5.26									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 0.0									
MAT 13 2.6										-4MAT 112 0.0										MAT 224 0.0									
MAT 50 0.0										MAT 60 0.0										MAT 12 5.26									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 0.0									
MAT 13 2.6										-4MAT 112 0.0										MAT 224 0.0									
MAT 50 0.0										MAT 60 0.0										MAT 12 5.26									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 0.0									
MAT 13 2.6										-4MAT 112 0.0										MAT 224 0.0									
MAT 50 0.0										MAT 60 0.0										MAT 12 5.26									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 0.0									
MAT 13 2.6										-4MAT 112 0.0										MAT 224 0.0									
MAT 50 0.0										MAT 60 0.0										MAT 12 5.26									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 0.0									
MAT 13 2.6										-4MAT 112 0.0										MAT 224 0.0									
MAT 50 0.0										MAT 60 0.0										MAT 12 5.26									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 0.0									
MAT 13 2.6										-4MAT 112 0.0										MAT 224 0.0									
MAT 50 0.0										MAT 60 0.0										MAT 12 5.26									
MAT 10 2.98										-3MAT 176 0.0										MAT 352 0.0									
MAT 13 2.6																													

(CONT)

```

CUTLIN
RODINS      0 2 0 14
0.0         0.0
1           2 3 4 0 0 0 0
BLANK
END
CUTLIN
RODINS      0 2 0 14
0.0         0.0
1           2 3 5 0 0 0 0
BLANK
END
CUTLIN
RODINS      0 2 0 14
0.0         0.0
1           1 0 6 1 0 0 0
BLANK
END
CUTLIN
RODINS      0 2 0 14
0.0         0.0
1           0 0 -3 0 0 1 0
DTININS     0 18 0 72
0.0         0.0          0.0          3.085      E+9 1.0          1.547      E-3
0.0         0.0          0.0          0.0          1.0          E-6 5.0          E-5
4.44      E-4 0.0          0.0          0.0          0.0          0.0
0 0 0 0 0 0 1 0 0 0 2 0 0 0 0 0 0 0 0 0 0 0 20 0 0 0 0
0 0 0 0 0 0 0 1 1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
BLANK
END

```

=CCNTROL1

RODHOD SAMPLE PROBLEM 3. ROD POSITIONING AND 2-CYCLE DEPLETION.

13500

1 2 6 2 2 12 7 2 13 12 7 -3 3 2 12 7 9 99 1 2 7 2 13 12
7 -3 3 2 12 7 9 0

END

INPUT PROCESSOR

OV RODSET

1D

2 2 2 14 2 4 5 0 0 0 0 0 0 0 8R

2E

* ROD1 * * ROD3 *

* ROD2 * * ROD4 *

2.0E-4 1.0E-4

5.0E-8 1.0E-8

3E

16 6 7 8 9 10 0

24 19 20 21 22 23 0

4D

0.0 0.33 0.67 1.0 1 0 10R

(CONT)


```

5E  0 0      2 1      2 1      1 2
4D  0.0  0.0  0.0  0.0      1  0 10R
5E  2 1      1 1      2 2      0 0
6F  E 7 E 9 10
7E  2.0E-8      1.0E-8      5.0E-8      1.0E-8
7E  2.0E-8      1.0E-8      5.0E-8      1.0E-8
7E  2.0E-8      1.0E-8      5.0E-8      1.0E-8
7D  2.0E-8      1.0E-8      5.0E-8      1.0E-8
7E  2.0E-8      1.0E-8      5.0E-8      1.0E-8
0V ISCTXS
1D  50      0      3      2R      1      1
2D /
  *XSICMPH - GAS COOLED THERMAL REACTOR DATA, 4 GEORG, C/HH 250*
  *      HE C  RD-147 I-135 O  RECVEI SI YE-135*
  *CS-133CS-134CS-135PH-147FH148HPPH-148SH-149SH-151EU-153 U-236*
  *PD-242AH-243 PP2  PE1 TH-232 U-233 U-234 U-235HF-239*
  *PH-149 XR-82 KR-E3RH-103RH-105AG-109XE-131XE-133HE-143HD-145*
  *SH-150SH-152EU-154EU-155PA-233 U-238PU-239PU-240PU-241*
  * RCD1 RCD2 RCD3 RCD4 *
9.67248E-01 3.27532E-02 5.14448E-09 8.91987E-13 1.14293E 09 1.05116E 08
6.24906E 06 5.20079E 05 1.49183E 07 1.83155E 05 5.82947E 02 1.65540E 00
5.00000E-03
  0      6      12      18      24      30      32      3E      40      46
  4E      54      60      62      64      70      76      82      88      94
  100     102     104     110     116     122     128     134     140     146
  148     154     160     162     168     170     176     182     188     194
  200     206     212     218     224     230     232     234     236     240
8E /
  *00000 AMFX 0000 *
C.C      3R      9.00000E 02 0.0      2R
  0      4P      1      C      3R      1      2R      C      2R      1
  2      3      1      5R      2      3R      1      2      3R      1
  2      3R      1      2      3R      1      16R
5E  2.57810E 00 6.67762E-01 6.06730E-01 8.36310E-01 3.14580E 00
7.25986E-01 7.24252E-01 7.88974E-01 0.0      2E  2.78643E-05
2.93440E-03 1.19341E-06 1.33243E-05 2.15008E-04 0.0
7D  2.97592E 00 6.75043E-01 1.69855E-01 6.77825E-01 5.09245E-02
7.86021E-01 4.61832E-02
7D  1.70303E 00 3.12825E-01-2.15962E-01 3.93942E-01-3.25585E-02
0.0      -2.94199E-02
7E  2.49017E 00 2.36066E-02 4.47904E-02 6.11222E-02-1.64663E-02
0.0      -1.49762E-02
7D  1.45394E 00-4.22392E-03 7.66402E-04 1.68972E-03-1.96502E-03
C.C      -1.83696E-03
8E /

```

(CONT)

```

*00000 AMPX 0C00 *
C.C      3P      9.00000E 02 0.0      2P
      0      3P      1      0      4P      1      2P      C      2P      1
      2      3      1      5P      2      3      4      1      2      3P
      1      2      3P      1      2      3P      1      16P
5D 2.46577E 00 4.35174E 00 4.50136E 00 5.24803E 00 2.80674E 00
7.63303E 00 4.75412E 00 4.75942E 00 7.71512E-07 8.39331E-06 1.41177E-05
1.69276E-03 1.57685E-C4 0.C      3P
7D 2.61199E 00 4.50573E 00 1.94566E-01 4.64181E 00 1.23259E-01
2.55316E-07 4.75749E 00 1.12136E-01 0.0      6.33316E-10
7C 1.02292E 00 9.47132E-01-1.61438E-01 8.96944E-01-1.09149E-01
0.0      -9.93541E-C2
7D 4.55871E-01 5.67507E-02-3.07904E-02 4.56869E-02-1.35393E-02
C.C      -1.21912E-02
7C 6.22019E-02 9.5852E-C4-2.05099E-03 1.62201E-04-6.26003E-04
0.0      -7.67064E-C4
4D /
*00000 AMPX 0000 *
0.0      3P      9.00000E 02 0.0      2P
      0      3P      1      0      4P      1      2P      C      2P      1
      2      3      1      5P      2      3      4      1      2      3P
      1      2      3P      1      2      3P      1      16P
5D 2.46577E 00 4.35174E 00 4.50137E 00 5.24805E 00 2.80674E 00
4.63303E 00 4.75414E 00 4.75944E 00 7.71513E-07 8.39332E-06 1.41177E-05
1.69276E-03 1.57686E-C4 0.C      3P
7C 2.61198E 00 4.50575E 00 1.94566E-01 4.64185E 00 1.23259E-01
2.55318E-07 4.75739E 00 1.12137E-01 0.0      6.33316E-10
7C 1.02292E 00 9.47135E-01-1.61438E-01 8.96943E-01-1.09149E-01
0.0      -9.93541E-C2
7C 4.55866E-01 5.67507E-02-3.07904E-02 4.56869E-02-1.35393E-02
C.C      -1.21912E-02
7C 6.22015E-02 9.58506E-C4-2.05099E-03 1.61959E-04-6.26003E-C4
0.0      -7.67055E-C4
4D /
*00000 AMPX 0C0C *
0.0      3P      9.00000E 02 0.0      2P
      0      3P      1      2P      0      3P      1      2P      4P      1
      1      2      3      1      5P      2      3      4      1      2
      2      3P      1      2      3P      1      2      3P      1      16P
5D 3.13309E 00 3.49224E 00 3.56285E 00 4.26410E 00 3.57519E 00
3.59199E 00 3.71039E 00 3.84786E 00-1.31110E-10 1.84405E-07 9.41494E-05
7.66246E-05 2.3605E-C3 0.C      3P      4.14379E-C6
0.0      3P
7D 3.44047E 00 3.51956E 00 1.36327E-01 3.64299E 00 7.24298E-C2
E.00388E-09 3.84754E 00 6.73772E-02 0.0      7.08456E-11
7C 1.33831E 00 3.93622E-01-1.47502E-01 5.26805E-01-6.62835E-02
0.0      -6.16085E-02
7D 2.00461E 00 8.77776E-03 1.06890E-02 2.27779E-02-5.93402E-03
C.C      -5.56677E-03
7C 3.46623E-01-3.3864CE-03 6.08069E-04-3.33343E-03-2.93148E-04
0.0      -3.68735E-04
4D /
*00000 AMPX 0G00 *
0.0      3P      9.00000E 02 0.0      2P

```

(CONT)

```

      0      3R      1      2F      0      3R      1      2F      0      2R
      1      2      3      1      5P      2      3      4      1
      2      3R      1      2      3R      1      2      3F      1      16R
5D  3.12309E 00 3.49224E 00 3.56285E 00 4.29819E 00 3.57919E 00
3.59199E 00 3.71039E 00 3.88196E 00-1.31110E-10 1.84405E-07 9.43394E-06
7.66246E-05 2.36058E-03 0.0      3R      4.14379E-06
0.0      3R
7D  3.44047E 00 3.51956E 00 1.36327E-01 3.64299E 00 7.24290E-02
E.C03F8E-C8 3.88160E 00 6.73772E-02 0.0      7.0E456E-11
7C  1.32831E 00 3.93622E-01-1.47502E-01 5.26805E-01-6.62835E-02
0.0      -6.16085E-C2
7E  2.00461E 00 8.77776E-03 1.06890E-02 2.27774E-02-5.53502E-03
C.C      -5.56677E-03
7E  3.48623E-01-3.3840CE-03 6.08068E-04-3.33343E-03-2.99138E-04
0.0      -3.68735E-08
4D /
*00000 AMPX 0000 *
0.0      3R      9.00000E 02 0.0      2R
      0      8P      1      2F      0      41R
5C  1.92891E-04 2.09843E-03 3.52984E-02 4.23190E-01 1.92891E-04
2.09843E-03 3.52984E-C2 4.23190E-01 1.92891E-04 2.09843E-03 3.52984E-02
4.23190E-01
4E /
*00001 AMPX 0000 *
C.C      3R      9.00000E 02 0.0      2R
      0      4R      1      C      3R      1      2R      C      2R      1
      2      3      1      5R      2      3      2      1      2      3R
      3      2      3R      1      2      3R      1      16R
5E  3.10707E 00 1.99226E 00 2.22252E 00 2.00551E 00 3.90666E 00
2.01736E 00 2.27274E 01 1.78903E 00 3.43629E-04 7.98C12E-04 5.48613E-03
6.77105E-C2 2.72171E-03 0.0      3R
7D  3.6E014E 00 1.98929E 00 2.23210E-01 2.24384E 00 2.72673E-02
9.46638E-09 1.72126E 00 2.34059E-02
7E  2.39878E 00 2.03120E-01-1.99809E-01 1.83595E-01-2.59151E-02
0.0      -2.23351E-C2
7D  1.01503E 00 1.02172E-02-2.96172E-02 -2.21143E-03-1.24702E-03
C.C      -8.97234E-04
7E  2.16732E-01-2.08337E-04 3.75275E-03-5.75056E-04 2.68899E-05
0.0      -7.20301E-04
4D /
*00000 AMPX 0000 *
0.0      3R      9.00000E 02 0.0      2R
      0      8R      1      2R      0      41R
5E  0.0      1.56276E-05 3.57801E 01 1.07966E 06 0.0
1.56276E-05 3.57801E 01 1.07966E 06 0.0      1.56276E-05 3.57801E 01
1.07966E 06
4E /
*00007 AMPX 0000 *
0.0      3R      9.00000E 02 0.0      2R
      0      5R      1      0      2R      1      2R      C      2R      1
      2      3      1      5R      2      3      2      1      2      3R
      1      2      3R      1      2      3R      1      16R
5C  5.24162E 00 9.31629E 00 7.13421E 01 1.27999E 01 6.24122E 00
9.35787E 00 7.140E0E 01 1.24574E 01 5.31251E-02 1.42214E 00 5.71515E 01

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(CONT)

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1.24574E 01 3.51442E-04 0.0          3P
7E 5.93460E 00 7.91014E 00 2.49621E-01 1.42398E 01 2.53890E-02
3.76348E-06 0.0          1.69701E-02
7D 2.59879E 00 1.43312E-01-2.90191E-02 2.30140E-01-2.46417E-02
C.C -1.70032E-02
7E 2.27862E 00 1.47069E-02-8.47828E-05 2.76750E-02 8.58402E-04
0.0 2.77598E-04
7D 8.41830E-01-1.60520E-03 4.75265E-05-2.29431E-03 4.50956E-04
C.C -7.59291E-04
4E /
*00CC7 AMFX 0000 *
5.55000E-09 0.0          2R 9.00000E 02 0.0          2R
0 8R 1 2R 0 41R
5E 0.0 2.15756E-01 4.72939E 00 5.67074E 01 0.0
2.15756E-01 4.72939E 00 5.67074E 01 0.0 2.15756E-01 4.72939E 00
5.67074E 01
4E /
*00C07 AMFX 0000 *
C.C 3R 9.00000E 02 0.0          2R
0 5F 1 C 2R 1 2R C 2R 1
2 3 1 5R 2 3 2 1 2 3R
1 2 3R 1 2 3P 1 16R
5E 6.18843E 00 8.32041E 00 1.36523E 01 4.01527E 00 6.22222E 00
8.35925E 00 1.36904E 01 3.68175E 00 3.06232E-02 5.40004E-01 5.50085E 00
3.68175E 00 3.51442E-04 0.0          3R
7D 5.94195E 00 7.79764E 00 2.49753E-01 8.17298E 00 2.14128E-02
3.76348E-06 0.0 1.65217E-02
7E 1.01339E-01 1.34757E-01-2.85773E-02 1.37047E-01-1.78794E-02
0.0 -1.65595E-02
7D 5.14828E-02 8.83294E-02 5.33364E-04 9.45985E-02 3.80371E-03
C.C 2.74138E-04
7E -2.91081E-03-4.95141E-03 1.03676E-03-4.55822E-03 2.38560E-03
0.0 -7.36116E-04
4E /
*00003 AMFX 0000 *
8.28900E-09 0.0          2R 9.00000E 02 0.0          2R
0 5R 1 C 2R 1 2R C 2R 1
2 3 1 5R 2 3 2 1 2 3R
1 2 3R 1 2 3P 1 16R
5E 6.33908E 00 2.24004E 01 4.54016E 02 1.00232E 02 6.37148E 00
2.24761E 01 4.54530E 02 1.00011E 02 2.64508E-01 6.32716E 00 3.41069E 02
1.00011E 02 3.09277E-04 0.0          3R
7D 6.00760E 00 1.61217E 01 9.94738E-02 1.13450E 02 2.72138E-02
1.05456E-06 0.0 1.09210E-02
7E 9.71876E-02 2.42104E-01-2.38718E-02 1.56823E 00-2.01749E-02
0.0 -1.09988E-02
7D 5.70041E-02 1.93006E-01 9.50392E-04 1.36635E 00 8.63032E-04
C.C 2.40188E-04
7E -2.07657E-03-1.92486E-02 3.58812E-04-5.79909E-02 1.18086E-02
0.0 -4.92957E-04
4D /
*00003 AMFX 0000 *
1.97600E-07 0.0          2R 9.00000E 02 0.0          2R
0 8R 1 2F 0 41R

```

(CONT)

5D 5.20537E 00 4.33614E 02 4.55179E 03 1.14261E 04 5.20537E 00
 4.33615E 02 4.55179E 03 1.14261E 04 5.20537E 00 4.33615E 02 4.55179E 03
 1.14261E 04

4E /

*00000 AMPX 0000 *

1.459905E-06 0.0 2F 9.00000E 02 0.0 2R
 0 0F 1 2P 0 41R

5D 1.34949E-01 8.01017E 02 7.49024E 03 6.34784E 02 1.34949E-01
 8.01017E 02 7.49024E 03 6.34785E 02 1.34949E-01 8.01017E 02 7.49024E 03
 6.34785E 02

4E /

*00000 AMPX 0000 *

0.0 3F 9.00000E 02 0.0 2R
 0 3F 1 3R 0 2R 1 2F 0 2R
 1 2 2 1 5R 2 3 2F 1
 2 3F 1 2 3R 1 2 3F 1 16R

5D 6.20074E 00 2.17072E 01 2.19597E 02 3.44371E 04 7.29523E 00
 2.16945E 01 2.19992E 02 3.44367E 04 2.04403E-01 4.71294E 00 1.47411E 02
 3.42374E 04 4.13097E-05 0.0 3R 4.13097E-05

0.0 3F 2.86234E-03 0.0 3R

7D 6.75284E 00 1.68954E 01 3.40324E-01 7.25592E 01 8.20986E-02
 3.67340E-05 1.99297E 02 2.26299E-02 9.62057E-09

7D 3.28337E 00-1.41980E-02-3.75784E-02 1.28732E 00-E.12057E-02

0.0 -2.23973E-02

7D 7.91340E 00 2.21054E-01 1.47339E-02-8.00660E-02-E.61421E-04

0.0 -1.05192E-04

7D 4.37595E 00-2.91617E-02-7.16833E-03-2.07294E-01 5.93021E-06

0.0 -2.76467E-04

4E /

*00000 AMPX 0000 *

0.0 3F 9.00000E 02 0.0 2R
 0 0F 1 2R 0 2R 1 2 3
 1 5R 2 3 2 1 2 3F 1
 2 3R 1 2 3R 1 16R

5D 5.17872E 00 1.80737E 01 2.72966E 02 3.18407E 03 7.39374E 00
 1.84782E 01 2.73055E 02 3.18403E 03 6.28214E-01 8.71855E 00 2.54678E 02
 2.15168E 03

7D 8.41092E 00 9.75213E 00 3.81949E-01 1.82724E 01 1.66622E-02

7.10325E-06 7.14922E 00 8.42998E-03

7D 6.64503E 00 1.22365E 00-1.56397E-02 2.91084E-01-1.85020E-02

1.42986E 01-8.16182E-03

7D 5.13624E 00 6.69608E-01-3.33777E-03 8.20015E-03-1.65438E-04

2.12490E 01-2.72105E-04

7D 2.02271E 00 1.13157E-02-4.36026E-03-9.67857E-02-E.50939E-06

2.15074E 01-8.51800E-06

4E /

*00000 AMPX 0000 *

0.0 3R 9.00000E 02 0.0 2R
 0 3R 1 3R 0 2R 1 2F 0 2R
 1 2 3 1 5R 2 3 2F 1
 2 3R 1 2 3R 1 2 3R 1 16R

5D 6.43328E 00 1.99577E 01 2.28357E 02 1.67382E 02 7.66708E 00
 1.99525E 01 2.28415E 02 1.67306E 02 2.03612E-01 7.56329E 00 2.10903E 02
 1.62896E 02 1.68900E-05 0.0 3R 1.68900E-05

(CONT)

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0.0          3R  5.01556E-04 0.0          3R
7D  6.71117E 00 1.23507E 01 7.52275E-01 1.75076E 01 3.83416E-02
5.39714E-05 4.41000E 00 3.67161E-03 1.08223E-07
7C  3.76139E 00 5.48719E-03-3.30522E-02 2.19920E-01-3.79096E-02
0.0          -3.77208E-03
7D  8.16598E 00 2.27800E-01 1.35739E-02-4.94580E-03-3.48340E-04
C.0          1.23598E-04
7C  4.81413E 00-2.47680E-02-7.20481E-03-3.22149E-02-6.61833E-06
0.0          -4.91887E-05
4D /
*00009 AMPX 0000 *
0.0          3R  9.00000E 02 0.0          2R
    0          1          2R          0          2R          1          0          2R          1          2R
    0          2R          1          2          3          1          5R          2          3          2
    1          2          3R          1          2          3R          1          2          3R
    1          16R
5D  6.45586E 00 1.61186E 01 7.27862E 01 1.22416E 01 6.59692E 00
1.64254E 01 7.30195E 01 1.20177E 01 2.33187E-01 1.57847E 00 4.77629E 01
7.64308E 00 3.35210E-01 0.0          3R  2.67206E 00
0.0          3R  9.67491E-01 3.25084E-02 0.0          2R
1.90945E-03 0.0          3R
7C  7.80409E 00 1.48011E 01 2.25700E-01 2.52455E 01 4.57651E-02
6.62910E-08 9.37453E 00 1.11661E-02
7D  6.42319E 00 9.31659E-01-1.80039E-02 7.57510E-01-4.54688E-02
C.0          1.11195E-02
7C  5.81012E 00 1.70488E-01-3.25139E-03-1.39644E-01-2.86181E-04
0.0          3.04443E-05
7D  5.45636E 00 6.93176E-02-7.53554E-04 1.37019E 00-1.31381E-05
0.0          -1.43035E-04
4E /
*00C09 AMPX 0000 *
0.0          3R  9.00000E 02 0.0          2R
    0          1          2R          0          2R          1          0          2R          1          2R
    0          2R          1          2          3          1          5R          2          3          2R
    1          2          3R          1          2          3R          1          2          3R
    1          16R
5D  5.44358E 00 1.94787E 01 2.00038E 02 2.32353E 01 7.85647E 00
1.99951E 01 2.00312E 02 2.31615E 01 7.98010E-02 1.11950E 00 1.64991E 02
1.41430E 01 8.34542E-01 2.24458E-02 0.0          2R  3.07068E 00
2.81523E 00 0.0          2R  9.69033E-01 3.09656E-02
0.0          2R  1.46746E-03 0.0          3R
7C  6.82342E 00 1.88045E 01 1.19961E-01 3.53170E 01 4.85461E-02
6.56151E-09 9.01828E 00 3.51854E-03 3.33390E-10
7C  7.23867E 00 1.55623E 00-1.09447E-02 8.82458E-01-4.82193E-02
0.0          -3.66491E-03
7D  7.06463E 00 3.40057E-01-4.78900E-03 1.87070E-01-3.18601E-04
C.0          1.71562E-04
7C  5.33400E 00 2.06200E-02-2.40470E-03 1.87323E 00 1.59671E-05
0.0          -4.67490E-05
4D /
*00007 AMPX 0000 *
0.0          3R  9.00000E 02 0.0          2R
    0          1          2R          0          5R          1          2R          0          2R          1
    2          3          1          5R          2          3          2          1          2          3R

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(CONT)

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      1      2      3R      1      2      3R      1      16R
5E 5.93956E 00 1.32942E 01 5.93667E 01 1.35758E 02 8.04658E 00
1.25523E 01 5.84008E 01 1.35326E 02 1.12334E-01 2.67491E 00 4.58648E 01
1.27963E 02 6.44305E-01 1.02001E-03 0.0 2F 3.30417E 00
3.04801E 00 0.0 2F 9.69033E-01 3.09656E-C2
0.0 2R
7D 6.69642E 00 1.08592E 01 5.9281 -01 1.25143E 01 1.65820E-02
1.10489E-05 7.36343E 00 2.16152E-02
7E 6.32104E 00 7.81957E-01 -1.21445E-02 1.23811E-01 -1.68822E-02
-2.18441E-02
7 5.52038E 00 3.25379E-01 -2.97654E-01 1.22263E-03 -5.22973E-05
0.0 -3.45947E-05
7E 4.50197E 00 -6.21486E-02 -2.99034E-03 1.00879E-02 -3.47239E-06
0.0 -2.67024E-04
4D /
*00000 AMPX 0000 *
0.0 3R 9.00000E 02 0.0 2R
0 8R 1 2F 0 41R
5E 1.97097E-02 2.43223E-01 1.01818E 00 4.70164E-01 1.57088E-02
2.43223E-01 1.01818E 00 4.70164E-01 1.97088E-02 2.43223E-01 1.01818E 00
4.70164E-01
4E /
*00000 AMPX 0000 *
0.0 3R 9.00000E 02 0.0 2R
0 8R 1 2F 0 41R
5E 6.86530E-02 7.07719E-01 1.12908E 01 6.08930E 00 6.86530E-02
7.07719E-01 1.12908E 01 6.08930E 00 6.86530E-02 7.07719E-01 1.12908E 01
6.08930E 00
4E /
*00012 AMPX 0000 *
0.0 3R 9.00000E 02 0.0 2R
0 1 2R 0 2R 1 0 2F 1 2R
0 2F 1 2 3 1 5R 2 3 2
1 2 3R 1 2 3R 1 2 3R
1 16R
5E 6.74856E 00 1.46992E 01 2.48454E 01 1.58112E 01 7.78346E 00
1.48474E 01 2.48898E 01 1.54954E 01 1.32977E-01 1.03964E 00 5.75569E 00
2.97429E 00 3.65722E-02 0.0 3R 2.38780E 00
0.0 3R 9.66726E-01 3.32735E-02 0.0 2R
4.92255E-03 0.0 3R
7D 7.39894E 00 1.37701E 01 2.19276E-01 1.91184E 01 3.76054E-02
3.46252E-06 1.25210E 01 1.55893E-02
7E 3.10469E 00 4.58310E-01 -2.15478E-02 1.78416E-01 -3.56998E-02
0.0 -1.56823E-02
7D 2.87748E 00 1.38050E-01 -1.12006E-03 2.68831E-02 2.55768E-03
0.0 3.25100E-04
7E 2.08293E 00 4.00112E-02 1.20162E-04 -4.65141E-03 2.84648E-03
0.0 -1.02151E-04
4D /
*00012 AMPX 0000 *
0.0 3R 9.00000E 02 0.0 2R
0 1 2R 0 2R 1 0 2R 1 2R
0 2R 1 2 3 1 5R 2 3 2
1 2 3R 1 2 3R 1 2 3R

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(CONT)

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      1      16R
5D  5.75028E 00 1.61560E 01 9.43845E 01 2.79501E 02 7.58843E 00
1.66293E 01 9.44175E 01 2.75182E 02 9.99478E-02 7.25030E-01 1.54036E 01
2.47907E 01 1.99346E 00 5.87426E 00 6.71102E 01 2.41667E 02 2.60400E 00
2.50295E 00 2.50290E 00 2.50299E 00 9.66726E-01 3.32735E-02
0.0      2F  2.21576E-03 0.0      3R
7D  5.34481E 00 1.00132E 01 1.51973E-01 1.18878E 01 1.67610E-02
3.49101E-06 1.25241E 01 1.57526E-02
7D  5.51442E 00 1.42429E 00-7.14977E-03 1.14311E-01-1.52453E-02
0.0      -1.58610E-02
7D  4.77002E 00 3.55422E-01-2.98031E-03 3.33175E-02 3.32814E-03
0.0      3.47680E-04
7D  4.31733E 00 5.69439E-02-1.73968E-03-2.96212E-03 1.14748E-03
0.0      -7.03976E-04
4D /
*00000 AMPX 0000 *
0.0      3F  9.00000E 02 0.0      2R
      0      1      2R      0      2F      1      0      2R      1      2R
      0      2R      1      2      3      1      5R      2      3      2
      1      2      3R      1      2      3R      1      2      3R
      1      16R
5D  5.47982E 00 1.22924E 01 1.35029E 02 4.43509E 01 7.60091E 00
1.26942E 01 1.35128E 02 4.40870E 01 1.45126E-01 1.44091E 00 9.88326E 01
3.50719E 01 8.83819E-01 6.24363E-03 0.0      2R  2.68880E 00
2.51198E 00 0.0      2R  9.67491E-01 3.25084E-02
0.0      2F  7.16556E-04 0.0      3R
7D  6.60242E 00 1.12280E 01 1.69992E-01 3.62822E 01 1.90349E-02
2.67754E-06 9.01482E 00 1.30360E-02
7D  6.96326E 00 1.21325E 00-1.22502E-02 3.19377E-01-1.69973E-02
0.0      -1.31063E-02
7D  7.08505E 00 3.16437E-02-8.62192E-03 7.36011E-02 4.38370E-04
0.0      2.65308E-04
7D  5.01930E 00 1.50977E-03 6.29727E-04-8.51338E-03 3.51208E-03
0.0      -5.85347E-04
4E /
*00000 AMPX 0000 *
0.0      3F  9.00000E 02 0.0      2R
      0      1      2R      0      2F      1      0      2F      1      2R
      0      2R      1      2      3      1      5R      2      3      4
      1      2      3R      1      2      3R      1      2      3R
      1      16R
5D  5.72185E 00 1.63125E 01 6.30657E 01 2.68703E 02 7.75384E 00
1.68246E 01 6.30578E 01 2.68359E 02 1.34089E-01 1.84846E 00 2.04299E 01
4.03853E 01 1.23606E 00 4.13846E 00 3.09010E 01 2.15453E 02 2.57171E 00
2.44355E 00 2.44200E 00 2.43012E 00 9.67491E-01 3.25084E-02
0.0      2R  2.70964E-03 0.0      3R
7D  6.22461E 00 1.08206E 01 1.61595E-01 1.17497E 01 1.69681E-02
3.02970E-05 1.25206E 01 1.70005E-02 1.19351E-08 1.97803E-07
7D  6.09595E 00 1.54120E 00-7.69936E-03 1.12872E-01-1.31008E-02
0.0      -1.71003E-02
7D  5.32394E 00 4.32141E-01-3.06619E-03 6.19511E-02 2.38017E-03
0.0      3.44318E-04
7D  4.85991E 00 6.98981E-02-7.04002E-04-9.34332E-03 7.24864E-03
0.0      -7.59242E-04

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(CONT)


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4C /
*00010 AMPX 0000 *
3.45700E-06 0.0      2F  9.06000E 02 0.0      2R
  0      1      2P      0      2F      1      C      2F      1      2R
  0      2P      1      2      3      1      5F      2      3      2
  1      2      3F      1      2      3P      1      2      3R
  1      16P
5E  5.97489E 00 1.50915E 01 8.62385E 01 3.31360E 01 8.04925E 00
1.55964E 01 8.62794E 01 3.36713E 01 1.77083E 01 4.83773E 00 7.20297E 01
2.26523E 01 9.80260E 01 9.55752E 04 0.0      2R  2.68716E 00
2.01399E 00 0.0      2F  9.67563E 01 3.24364E 02
0.0      2P  3.01236E 03 0.0      3R
7E  6.45546E 00 1.07375E 01 4.34725E 01 1.62366E 01 1.99716E 02
8.83168E 06 1.00190E 01 1.30912E 02
7E  6.22309E 00 1.52013E 00 8.55754E 03 1.46541E 01 1.88945E 02
0.0      -1.31456E 02
7E  5.26965E 00 3.71457E 01 4.01183E 03 2.27852E 02 1.62258E 03
0.0      2.41786E 04
7E  4.63858E 00 5.23997E 02 2.54121E 03 3.56983E 03 1.22167E 03
0.0      -5.80562E 04
4C /
*00003 AMPX 0000 *
0.0      3F  9.00000E 02 0.0      2R
  0      3P      1      2F      0      3R      1      2F      0      2R
  1      2      3      1      5R      2      3R      1      2      3R
  1      2      3R      1      2      3R      1      16F
5E  2.93731E 00 3.39643E 00 3.55474E 00 4.06611E 00 3.72023E 00
3.57505E 00 3.70057E 00 3.65880E 00 5.03087E 09 0.0      2R
7.53278E 05 3.15954E 03 0.0      3R  4.47109E 06
0.0      3R
7E  3.55890E 00 3.50259E 00 1.18149E 01 3.63478E 00 7.24595E 02
3.65850E 00 6.57908E 02
7E  2.34876E 00 5.94923E 01 9.23489E 02 5.21436E 01 6.60665E 02
0.0      -6.02873E 02
7E  2.05045E 00 7.87484E 02 2.18193E 02 4.26137E 02 5.37991E 03
0.0      -5.06450E 03
7E  6.48976E 01 2.79185E 02 5.70892E 04 3.62524E 03 4.66359E 04
0.0      -1.52534E 03
4C /
*00006 AMPX 0000 *
0.0      3R  9.00000E 02 0.0      2R
  0      8P      1      2F      0      41R
5E  9.94162E 03 1.08602E 01 3.28963E 01 1.90435E 01 9.94163E 03
1.08602E 01 3.28963E 01 1.90436E 01 9.94163E 03 1.08602E 01 3.28963E 01
1.90436E 01
4C /
*00006 AMPX 0000 *
0.0      3R  9.00000E 02 0.0      2R
  0      5R      1      0      2R      1      2R      C      2R      1
  2      3      1      5R      2      3      2      1      2      3R
  1      2      3R      1      2      3R      1      16R
5E  5.64750E 00 7.85334E 00 4.09491E 01 8.41827E 01 5.70347E 00
7.90555E 00 4.10588E 01 8.37370E 01 6.93716E 02 1.12270E 00 2.67663E 01
8.37370E 01 1.87653E 05 0.0      3R

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(CONT)

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7D 5.55103E 00 6.75556E 00 8.29551E-02 1.42702E 01 2.69587E-02
4.34618E-07 0.0 2.22314E-02
7D 1.67884E-01 1.86625E-01-4.69091E-02 3.60467E-01-2.51713E-02
0.0 -2.21289E-02
7D 4.90403E-02 7.41765E-02 1.76921E-04 1.62118E-01 2.61674E-03
0.0 2.19271E-04
7D -2.61216E-03-4.86018E-03 4.42034E-05-8.89209E-03 1.08375E-03
0.0 -5.81394E-04
4D /
*00004 AMPX 0000 *
0.0 2F 9.00000E 02 0.0 2P
0 5R 1 0 2F 1 2F C 2R 1
2 3 1 5F 2 3 2 1 2 3R
1 2 3R 1 2 3R 1 16F
5D 6.46065E 00 8.81232E 00 1.12843E 01 1.63412E 02 6.51050E 00
8.85721E 00 1.13227E 01 1.63009E 02 1.60869E-01 1.34826E 00 5.03467E 00
1.63009E 02 1.59176E-04 0.0 3R
7D 6.21639E 00 7.48525E 00 1.33066E-01 6.26756E 00 1.96753E-02
1.21871E-06 0.0 2.04534E-02
7D 1.49536E-01 1.63087E-01-4.44511E-02 1.37354E-01-1.75742E-02
0.0 -2.03222E-02
7D 5.45415E-02 8.51728E-02 7.10626E-04 7.21563E-02 1.62007E-03
0.0 1.58697E-04
7D -2.52007E-03-7.33451E-03 1.76629E-04-6.35866E-03 3.53144E-03
0.0 -8.93161E-04
4D /
*00004 AMPX 0000 *
5.36300E-06 0.0 2R 9.00000E 02 0.0 2F
0 8R 1 2F C 41R
5D 2.79681E 00 3.04901E 01 5.13419E 02 6.34785E 03 2.79681E 00
3.04901E 01 5.13419E 02 6.34785E 03 2.79681E 00 3.04901E 01 5.13419E 02
6.34785E 03
4E /
*00006 AMPX 0000 *
0.0 3P 9.00000E 02 0.0 2R
0 5R 1 0 2R 1 2R C 2R 1
2 3 1 5R 2 3 2 1 2 3R
1 2 3R 1 2 3R 1 16F
5D 6.36386E 00 8.59750E 00 2.39025E 02 3.98383E 01 6.40733E 00
8.63389E 00 2.39175E 02 3.95088E 01 3.52660E-01 2.73574E 00 2.13352E 02
3.95088E 01 2.21664E-04 0.0 3R
7D 5.89610E 00 5.86708E 00 1.58649E-01 2.58112E 01 2.70430E-02
1.79201E-06 0.0 1.63642E-02
7D 1.30396E-01 1.33310E-01-3.77832E-02 4.92576E-01-2.43954E-02
0.0 -1.63628E-02
7D 5.12228E-02 6.46015E-02 4.19351E-04 3.00602E-01 3.55648E-03
0.0 2.40273E-04
7D -2.74995E-03-6.32217E-03 5.22240E-04-1.33833E-02 3.79223E-03
0.0 -7.32702E-04
4D /
*00009 AMPX 0000 *
0.0 3R 9.00000E 02 0.0 2R
0 5R 1 0 2P 1 2R C 2R 1
2 3 1 5F 2 3 2 1 2 3R

```

(CONT)

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      1      2      3R      1      2      3R      1      16R
SD 6.28735E 00 6.65566E 00 4.84552E 02 5.09277E 01 6.32362E 00
6.72194E 00 8.86391E 02 5.04041E 01 7.39120E-02 1.04382E 00 1.23911E 02
5.04041E 01 3.82401E-04 0.0 3R
7D 6.12473E 00 5.66605E 00 1.25024E-01 3.62453E 02 1.20166E-02
1.43069E-06 0.0 2.59006E-02
7D 1.08775E-01 9.63374E-02-2.73708E-02 5.52636E 00-1.01702E-02
0.0 -2.59941E-02
7D 5.71200E-02 6.45940E-02 3.12367E-04 4.30893E 00 2.29527E-03
0.0 4.66426E-04
7D -3.40406E-03-2.89431E-03 1.20025E-03-1.14937E-01 1.06121E-03
0.0 -1.15968E-03
4D /
*00004 AMPX 0000 *
1.52200E-06 0.0 2R 9.00000E 02 0.0 2R
0 8R 1 2R 0 41R
SD 0.0 3.08424E-01 6.63567E 00 8.04060E 01 0.0
3.08424E-01 6.63568E 00 8.04061E 01 0.0 3.08424E-01 6.63568E 00
8.04061E 01
4D /
*00049 AMPX 0000 *
0.0 3R 9.00000E 02 0.0 2R
0 5R 1 C 2R 1 2R C 2R 1
2 3 1 5R 2 3 2 1 2 3R
1 2 3R 1 2 3R 1 16R
SD 6.40169E 00 6.61783E 00 2.20055E 01 1.32340E 02 6.43672E 00
6.64188E 00 2.20714E 01 1.30839E 02 4.54899E-02 9.80563E-01 1.07566E 01
1.30839E 02 1.02870E-03 0.0 3R
7D 6.30354E 00 5.64873E 00 8.83660E-02 1.12403E 01 1.25653E-02
6.73470E-07 0.0 7.45080E-02
7D 1.05084E-01 8.82105E-02-2.51143E-02 2.09371E-01-9.24855E-03
0.0 -7.45357E-02
7D 6.10857E-02 6.73261E-02 1.03337E-03 1.35330E-01 1.63552E-04
0.0 1.12524E-03
7D -2.12353E-03-8.07065E-03 3.03717E-04-3.57817E-02 5.42428E-03
0.0 -3.30308E-03
4D /
*00016 AMPX 0000 *
0.0 3R 9.00000E 02 0.0 2R
0 5R 1 0 2R 1 2R C 2R 1
2 3 1 5R 2 3 2 1 2 3R
1 2 3R 1 2 3R 1 16R
SD 6.37774E 00 2.15276E 01 9.12412E 01 2.59673E 01 6.41262E 00
2.16265E 01 9.14355E 01 2.53044E 01 4.16074E-02 9.08093E-01 4.85425E 01
2.53044E 01 1.02870E-03 0.0 3R
7D 6.28275E 00 2.06821E 01 8.89675E-02 4.28602E 01 3.63785E-02
6.73470E-07 0.0 3.28264E-02
7D 1.04598E-01 3.13102E-01-2.56717E-02 6.16604E-01-2.69029E-02
0.0 -3.29162E-02
7D 6.09676E-02 2.47910E-01 1.04156E-03 5.16048E-01 9.15888E-04
0.0 5.67261E-04
7D -2.17245E-03-2.54231E-02 3.47912E-04-3.47091E-02 1.57622E-02
0.0 -1.46683E-03
4D /

```

(CONT)

```

*00007 AMPX 0000 *
C.C      3R      9.00000E 02 0.0      2R
  0      5R      1      C      2R      1      2R      C      2F      1
  2      3      1      5R      2      3      2      1      2      3F
  1      2      3F      1      2      3R      1      16F
5D 5.27307E 00 1.24737E 01 8.79815E 01 3.62520E 01 7.17288E 00
1.26682E 01 8.81259E 01 3.59712E 01 4.55395E-02 6.99828E-01 4.60940E 01
3.59712E 01 2.78935E-03 0.0      3R
7D 6.93347E 00 1.18660E 01 1.96112E-01 4.20182E 01 1.02196E-01
2.68707E-06 0.0      1.38944E-02
7E 5.69941E 00 5.57458E-01-2.19302E-02 5.55057E-01-9.60404E-02
0.0      -1.39359E-02
7D 4.09825E 00 2.38175E-01-2.47245E-03 1.66354E 00 4.25466E-03
C.0      2.47655E-04
7E 1.27797E 00-4.96275E-03-2.54616E-03-6.27631E-02 1.00911E-02
0.0      -6.25710E-04
4D /
*00007 AMPX 0000 *
O.C      3F      9.00000E 02 0.0      2R
  0      5R      1      0      2R      1      2R      C      2R      1
  2      3      1      5F      2      3      2      1      2      3R
  1      2      3R      1      2      3R      1      16F
5D 5.27400E 00 1.24592E 01 7.91620E 02 9.20072E 01 7.17381E 00
1.26537E 01 7.93542E 02 9.15903E 01 4.64753E-02 6.85335E-01 3.41502E 02
9.15903E 01 2.78935E-03 0.0      3R
7D 6.93347E 00 1.18660E 01 1.96112E-01 4.52020E 02 1.02196E-01
2.68707E-06 0.0      2.05690E-02
7E 5.69941E 00 5.57458E-01-2.19302E-02 5.88960E 00-9.60404E-02
0.0      -2.07012E-02
7D 4.09825E 00 2.38175E-01-2.47245E-03 2.21883E 01 4.25466E-03
C.0      4.29899E-04
7E 1.27797E 00-4.96275E-03-2.54616E-03-8.17499E-01 1.00911E-02
0.0      -9.30030E-04
4D /
*00005 AMPX 0000 *
1.37300E-09 0.0      2R      9.00000E 02 0.0      2F
  0      5R      1      0      2R      1      2R      0      2R      1
  2      3      1      5F      2      3      2      1      2      3R
  1      2      3R      1      2      3R      1      16F
5D 7.27314E 00 1.35254E 01 1.03007E 02 6.34979E 02 7.30553E 00
1.35491E 01 1.03029E 02 6.34785E 02 4.74272E-01 7.57814E 00 9.77429E 01
6.34785E 02 4.42918E-04 0.0      3R
7D 6.61205E 00 5.95870E 00 2.19208E-01 5.27657E 00 1.21223E-02
3.21523E-06 0.0      9.66173E-03
7E 9.71366E-02 8.67796E-02-2.47913E-02 7.63807E-02-9.20216E-03
0.0      -9.69378E-03
7D 6.08140E-02 6.98152E-02 2.18195E-04 6.26326E-02 1.27327E-03
C.0      1.73381E-04
7E -3.90999E-03-7.45956E-03 1.74831E-03-6.25710E-03 5.23340E-03
0.0      -4.34716E-04
4D /
*00008 AMPX 0000 *
1.15700E-08 0.0      2R      9.00000E 02 0.0      2R
  0      5R      1      0      2R      1      2R      0      2R      1

```

(CONT)

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      2      2      1      5F      2      3      2      1      2      3R
      1      2      3R      1      2      3R      1      16F
5E 7.1219CE 00 1.08471E 01 5.05458E 02 5.92497E 03 7.15593E 00
1.08758E 01 5.05489E 02 5.92466E 03 1.67817E-01 3.87567E 00 4.98378E 02
5.92466E 03 4.3377CE-04 0.0 3R
7D 6.77998E 00 6.98462E 00 2.08004E-01 7.09576E 00 1.54828E-02
2.91294E-06 0.0 1.53591E-02
7C 1.02066E-01 1.03449E-01-2.68299E-02 1.05287E-01-1.17234E-02
0.0 -1.54260E-02
7D 6.25481E-02 8.20782E-02 4.09974E-04 8.41342E-02 1.48230E-03
0.0 3.03749E-04
7E -3.73660E-03-9.40157E-03 1.57649E-03-9.64761E-03 6.70320E-03
0.0 -7.28085E-04
4D /
*00000 AMPX 1119 *
0.0 3R 5.00000E 02 0.0 2R
      0      1      2R      0      2R      1      0      2R      1      2R
      0      2R      1      2      3      1      5R      2      3      4
      1      2      3R      1      2      3R      1      2      3R
      1      16F
5E 5.93884E 00 1.41084E 01 7.19178E 01 6.84727E 01 7.66722E 00
1.43391E 01 7.19902E 01 6.81406E 01 2.36799E-01 3.47652E 00 6.07536E 01
5.97616E 01 2.33417E-01 0.0 3R 2.59735E 00
0.0 3R 9.64562E-01 3.54358E-02 6.89751E-06 7.00056E-11
5.92723E-04 0.0 3F
7C 6.26200E 00 1.0845EE 01 9.34801E-01 1.12199E 01 1.5E413E-02
2.39481E-05 8.37894E 00 1.67420E-02 1.78845E-09 4.05463E-11
7C 5.18513E 00 7.00471E-01-1.32397E-02 2.36872E-01-1.54665E-02
0.0 -1.64872E-02
7C 4.86398E 00 1.25156E-01-2.39894E-03 1.60922E-01-8.85167E-05
0.0 -2.48765E-04
7D 4.68015E 00 3.80234E-02-5.00780E-04 2.81563E-01-1.20024E-06
0.0 -6.28105E-06
4C /
*92238 AMPX 1262 *
2.36006E 02 3.16200E-11 7.60000E-13 9.00000E 02 0.0 2R
      0      1      2R      0      2R      1      0      2F      1      2R
      0      2R      1      2      3      1      5R      2      3      2R
      1      2      3F      1      2      3R      1      2      3R
      1      16R
5E 5.90067E 00 1.56772E 01 7.18103E 01 1.03150E 01 8.23846E 00
1.60283E 01 7.13120E 01 1.00976E 01 9.53068E-02 9.80202E-01 3.65434E 01
1.17998E 00 1.50259E-01 1.27308E-04 2.27981E-08 3.98E13E-09 2.73506E 00
2.32169E 00 2.31952E 00 2.31951E 00 9.65345E-01 3.46541E-02 6.74445E-06
1.21590E-09 3.96899E-03 0.0 3R
7C 7.79106E 00 1.50330E 01 2.05065E-01 3.47577E 01 1.48498E-02
1.59677E-06 8.91753E 00 1.08541E-02 3.12371E-09
7D 7.01333E 00 1.06210E 00-1.40582E-02-1.47983E 00-1.19377E-02
0.0 -1.07923E-02
7D 6.85172E 00-6.62846E-02-2.82480E-03 2.05343E 01-2.65298E-03
0.0 -5.98486E-05
7C 5.51166E 00 1.13388E-01-3.10318E-03 6.47393E-01-4.33298E-04
0.0 -2.88015E-06
4D /

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(CONT)

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*98239 AMPX 1268 *
2.36995E 02 3.28300E-11 1.03000E-12 9.00000E 02 0.0 2R
0 1 2R 0 2F 1 0 2F 1 2R
0 2R 1 2 3 1 5R 2 3 2R
1 2 3R 1 2 3R 1 2 3R
1 16R
SD 5.10599E 00 1.56283E 01 7.36096E 01 1.30692E 03 E.C2580E 00
1.59784E 01 7.35731E 01 1.30668E 03 7.41659E-02 1.78538E 00 2.60668E 01
4.E9306E 02 1.69830E 00 2.68207E 00 3.46199E 01 9.0E477E 02 3.05237E 00
2.87627E 00 2.87331E 00 2.87331E 00 9.66769E-01 3.3213E-02 6.45228E-06
1.16323E-09 8.3076E-04 0.0 3R
7D 6.10646E 00 1.14780E 01 1.47208E-01 1.28743E 01 2.89027E-02
2.25928E-06 8.89587E 00 1.21391E-02 1.57768E-09
7E 6.35941E 00 1.05629E 00-9.37277E-03-7.31860E-02-2.86332E-02
0.0 -1.20665E-02
7D 5.55733E 00 4.07280E-01-3.36739E-03 5.27314E-01-1.13838E-04
0.0 -7.27708E-05
7E 5.23507E 00 5.51753E-02-2.89320E-03 6.00552E-01 6.40717E-06
0.0 2.36079E-06
4E /
*98280 AMPX 1265 *
2.37992E 02 3.28300E-11 8.70000E-13 9.00000E 02 0.0 2R
0 1 2R 0 2R 1 0 2F 1 2R
0 2R 1 2 3 1 5R 2 3 2R
1 2 3R 1 2 3R 1 2 3R
1 16R
SD 5.83562E 00 1.61076E 01 5.27045E 01 9.87087E 02 7.55779E 00
1.66674E 01 5.38593E 01 9.86382E 02 1.16752E-01 1.63604E 00 2.55253E 01
9.22008E 02 9.78413E-01 1.35146E-01 1.94363E-01 1.77161E-01 3.11853E 00
2.87265E 00 2.86981E 00 2.86979E 00 9.66450E-01 3.35582E-02 6.51945E-06
1.17535E-09 3.34475E-04 0.0 3R
7E 6.72076E 00 1.48E27E 01 1.41838E-01 2.81041E 01 1.34148E-02
7.15483E-07 6.41943E 01 3.545E7E-02 2.29467E-10
7D 6.36649E 00 1.68591E 00-9.90483E-03 3.48050E 00-1.28014E-02
0.0 -3.50509E-02
7E 5.52546E 00 6.93724E-01-3.73440E-03 4.33453E 00-7.89994E-04
0.0 -4.08440E-04
7D 5.09720E 00 1.11934E-01-3.40170E-03 2.16000E 00 1.25460E-04
0.0 7.01705E-06
4E /
*98241 AMPX 1266 *
2.3E978E 02 3.30500E-11 1.00000E-12 9.00000E 02 0.0 2R
0 1 2R 0 2R 1 0 2F 1 2R
0 2R 1 2 3 1 5R 2 3 2
1 2 3R 1 2 3R 1 2 3R
1 16R
SD 6.03566E 00 1.73595E 01 1.10233E 02 9.71900E 02 8.89639E 00
1.79953E 01 1.10265E 02 9.71688E 02 1.32591E-01 1.32619E 00 1.73739E 01
2.54714E 02 1.62660E 00 5.12068E 00 8.06643E 01 7.05573E 02 7.10284E 00
2.93457E 00 2.93252E 00 2.93229E 00 9.65702E-01 3.42565E-02 6.67079E-06
1.20263E-09 5.86765E-03 0.0 3R
7D 6.86353E 00 1.15305E 01 2.79438E-01 1.22165E 01 1.78676E-02
1.55570E-06 1.10020E 01 1.06619E-02
7E 8.58215E 00 1.91021E 00-4.64423E-03 1.19356E-01-1.77490E-02

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(CONT)

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C.C      -1.05993E-02
7E 7.57275E 00 2.63161E-01-7.80889E-03 4.03605E-02-1.01149E-04
0.C      -6.17877E-C5
7E 5.75026E 00-4.50323E-02-2.22363E-03-8.02521E-02-4.52271E-06
C.C      -2.80946E-06
#E /
*00000 AMPX 0000 *
C.C      3P 9.00000E 02 0.0 2R
0 8P 1 2P 0 #1R
5E 1.92891E-00 2.09843E+01 3.52984E+02 4.23190E+03 1.92891E-00
2.09843E+01 3.52984E+02 4.23190E+03 1.92891E-00 2.09843E+01 3.52984E+02
4.23190E+03
#E /
*00000 AMPX 0000 *
C.C      3P 9.00000E 02 0.0 2R
0 8P 1 2R 0 #1R
5E 1.92891E-02 2.09843E-01 3.52984E-00 4.23190E+01 1.92891E-02
2.09843E-01 3.52984E+00 4.23190E+01 1.92891E-02 2.09843E-01 3.52984E+00
4.23190E+01
#E /
*00000 AMPX 0000 *
C.C      3P 9.00000E 02 0.0 2R
0 8P 1 2R 0 #1R
5E 1.92891E-02 2.09843E-01 3.52984E-00 4.23190E+01 1.92891E-02
2.09843E-01 3.52984E+00 4.23190E+01 1.92891E-02 2.09843E-01 3.52984E+00
4.23190E+01
#E /
*00000 AMPX 0000 *
C.C      3P 9.00000E 02 0.0 2R
0 8P 1 2R 0 #1R
5E 1.92891E-03 2.09843E-02 3.52984E-01 4.23190E+00 1.92891E-03
2.09843E-02 3.52984E-01 4.23190E+00 1.92891E-03 2.09843E-02 3.52984E-01
4.23190E+00
0V EXPOSE / EXPOSURE DATA FOR PBR, U-235, 238, TH, DV 11-29-77
1E 13028 44 0 1 0 6 19 16 0 0 0 0 0 127 0 0 0 0 0
2D 60R (U-235, 238, TH) BDNFNF BASIC CHAIN EXPOSURE DATA (DV-7-77)
12H
60RTH-232PA-233 U-233 U-234 U-235 U-236 U-238HE-239PU-239PU-240
60RPU-241PU-242AH-243 I-135XE-135PR-147PR-148PR148RPR-149SN-149
18RND-143 PF1 PF2
60R KR-82 KR-83RH-103RH-105AG-107XE-131XE-133CS-133CS-134CS-135
48RND-145EU-152EU-154EU-155ND-147SN-150SN-151SN-152
14R PCD3 FCC4 RCE2
3C 0. 1 3 5 7 9 11 14 15 19 21 22 23 24 25 26 27 28 29 30 34 35
37 38 40 41 2 8 11 14 15 16 17 18 19 27 30 32 36 37 38 40 /
4D 2.93E-7 3.41-6 1.68-9 /
2.87E-5 2.09E-5 8.29E-9 1.49E-6 1.98E-7 3.63E-6 /
5.36E-6 1.52E-6 9.55E-9 1.37E-9 1.16E-8 7.23E-7 2.75E-10 /
5E .0539 .0562 .0617 .0578 .0693 .0626 /
.0021 .0022 .0024 .0022 .0027 .0024 /
.00945 .0077 .0113 .021 .013 .012 /
.08 .0591 .0603 .048 .046 .056 /
.301 .209 .298 .275 .324 .324 /
1.137 1.119 1.26 1.426 1.456 1.456 /

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(CONT)

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.01 .0069 .0028 .0005 .0017 .0007 /
.0199 .0118 .00588 .0009 .0029 .001 /
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.037 .0588 .0659 .052 .069 .06 /
.066 .0338 .0396 .039 .031 .036 /
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.00009 .0003 .00033 .0013 .0016 .001 /
.0382 .0193 .0236 .028 .0205 .022 /
.002 .0035 .0088 .009 .008 .005 /
.00085 .0022 .00281 .006 .006 .003 /
BC 1 +2 2 +1 3 +2 4 +2 5 +2 6 0 /
1 +2 2 +2 -4 +2 -5 +2 -6 0
7 +2 8 +1 9 +2 10 +2 11 +2 12 +2 13 0 /
7 +2 8 +2 -10 +2 -11 +2 -12 +2 -13 0 /
14 +1 15 +1 16 0 /
38 +1 16 +530002 17 +2 19 +1 20 +2 36 +2 80 +2 81 0 /
38 +1 16 +470002 18 +2 -19 +1 -20 +2 -39 +2 -80 +2 -81 0 /
-41 +2 35 +2 36 +2 37 0 /
24 +2 25 0 26 0 27 0 28 0 29 0 /
21 0 22 +2 23 0 30 +1 31 +2 32 0 34 0 42 +2 43 0 44 0 0

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SICF

END

DCPSFR CROSS SECTION PROCESSING

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1 1 50 1 1
C C 12. 5
I-135 I-135 135. 4
XE-135XE-135 135. 4
FE-147PH-147 147. 4
PE-148PH-148 148. 4
FE-148PH-148 148. 4
SH-149SH-149 149. 4
U-236 U-236 236. 3.26 -11 3
FC-242PH-242 242. 3.38 -11 3
FM-243AH-243 243. 3.39 -11 3
FF2 FF2 116. 4
FE1 FE1 116. 4
TH-232TH-232 232. 3.18 -11 2
PA-233PA-233 233. 3.19 -11 1
U-233 U-233 233. 3.19 -11 1
U-234 U-234 234. 3.19 -11 2
U-235 U-235 235. 3.21 -11 1
WF-239WF-239 239. 3.27 -11 1
FE-149FE-149 149. 4
UC-143UC-143 143. 4
U-238 U-238 238. 3.31 -11 2
PU-239PU-239 239. 3.34 -11 1
FH-240PH-240 240. 3.36 -11 2
FO-241PH-241 241. 3.37 -11 1
HE HE 4. 5
UC-147UC-147 147. 4

```

(CONT)

C	E.	
RECVELRECVEL		5
SI SI	10.	5
CS-133CS-133	133.	8
CS-134CS-134	134.	8
CS-135CS-135	135.	4
SH-151SH-151	151.	8
EU-153EU-153	153.	8
KP-82 KP-82	82.	8
KP-83 KP-83	83.	8
FR-103FR-103	103.	8
FE-105FE-105	105.	8
AG-109AG-109	109.	8
XE-131XE-131	131.	8
XE-133XE-133	133.	8
HE-145HE-145	145.	8
SH-150SH-150	150.	8
SH-152SH-152	152.	8
EU-154EU-154	154.	8
EU-155EU-155	155.	8
FCE1 BCE1	10.	7
BCD2 BCE2	10.	7
BCD3 BCE3	10.	7
FCE4 BCE4	10.	7
EST		
EVENTR TWO DIMENSIONAL NEUTRONICS		
001		
	50.	+6 .9E 1.0 -0002
0		
1 1 -1	50	
1 1 1		2 1
003		
7 1 2 2 2	4 4	
0.0 0.0	0.0 0.4692	
19 20 21 22		
004		
1 1.0 2 4.	8 67. 4 30. 3 23. 1 6.	
3 24.		
1 24. 1 6.	2 40. 2 40. 2 40. 2 40.	
2 40. 1 6.	1 24.	
005		
24 17 17 16 17 17 17		
24 17 17 16 17 17 17		
19 1 1 6 11 18 18		
20 2 2 7 12 18 18		
21 3 3 8 13 18 18		
22 4 4 9 14 18 18		
23 5 5 10 15 18 18		
17 17 17 17 17 17 17		
17 17 17 17 17 17 17		
012		
1 16 1 1 0.61		

17 18 1 2 1.0
19 24 2 3 1.0

C13

00

00

TR-232FA-233 U-233 U-234 U-235 U-236VP-239PU-242AM-243 U-238FO-239PU-240
FC-241 C I-135XE-135PM-147PM-148PM-148PM-149SM-149ND-143 PP1 PP2
KE-82 KE-83RH-103RH-105AG-109XE-131XE-133CS-133CS-134CS-135ND-145EU-153
EU-154EU-155ND-147SM-150SM-151SM-152 C SI RECVEL HE ROD3 ROD4
00

TR-232PA-233 U-233 U-234 U-235 U-236NP-239EU-242AM-243 U-238PU-239PU-240
PU-241 C I-135XE-135PM-147PM-148PM-148PM-149SM-149ND-143 PP1 PP2
KE-82 KE-83RH-103RH-105AG-109XE-131XE-133CS-133CS-134CS-135ND-145EU-153
EU-154EU-155ND-147SM-150SM-151SM-152 O SI RECVEL HE ROD1 ROD2

20

1 15

EE 2.1 -4 SI 4. -8 0 6.4 -4RECVEL 5. -5
C .08

1 5

U-235 2. -5 U-238 .10526-5TH-232 3.2 -4

6 10

U-235 2.4 -5 U-238 .11579-5TH-232 3.2 -4

11 15

U-235 2.8 -5 U-238 .12631-5TH-232 3.2 -4

16 17

C .15 HE 1. -5

18 18

C .1 HE 2.5 -5

19 22

HE 1.05 -4 C .03 ROD1 2. -4

23 23

HE 1. -4 C .06 ROD2 5. -6

24 24

C .12 HE 1. -4RECVEL 1. -3

C28

1

9

2 1

1 15

U-235 2. -5 U-238 .10526 -5

END

CUTLIN

ECDIWS 0 1 0 14

300.0

0 0 1 0 0 0 0 1 0 -2 0 0 0 0

EXFINS

0 6 0 24

100.0

0 0 1 2

ELANK

END

(CONT)

```

PUTLIN
RCDINS      0 1 0 14
300.0
C 0 1 0 0 0 0 1 0 0 0 0 0 1
LYNINS      0 6 0 72
                    50.  +6  -9-  50  1.0
C              2
                    1
                    1

```

```

BLANK
END
PUTLIN
RCDINS      0 1 0 14
300.0
C 0 1 0 0 0 0 1 0 -4 0 0 0 1
ETNINS      0 6 0 72
                    50.  +6  -98  50  1.0
C              1 2
                    1 1
                    1 1 2
1
1
1

```

```

BLANK
END
DENMAN
18
1 0 0 0 0 0
C20
1 10
PA-233 0.0      U-233 0.0      U-234 0.0      U-236 0.0
NP-239 0.0      PU-242 0.0      AH-243 0.0      PU-239 0.0
FO-241 0.0      I-135 0.0      XE-135 0.0      FR-147 0.0
EM-148 0.0      PH148W 0.0      PH-149 0.0      SR-149 0.0
ND-143 0.0      PF1 0.0      PF2 0.0      KR-82 0.0
KR-83 0.0      RH-103 0.0      RH-105 0.0      AG-109 0.0
XE-131 0.0      XE-133 0.0      CS-133 0.0      CS-134 0.0
CS-135 0.0      WD-145 0.0      PU-153 0.0      PU-154 0.0
EU-155 0.0      WD-147 0.0      SH-150 0.0      SH-151 0.0
SM-152 0.0      PU-240 0.0
1 5
C-235      2. -5 U-238      .10526-5TH-232 3.2      -4
6 10
U-235      2.4 -5 U-238      .11579-5TH-232 3.2      -4
0 0

```

```

END
INFUT PROCESSOR
OV SEARCH
10
1 0 19R
20
1.0 0.0 5.0E-5 1.0E-3 0.0 0.0 5R
9 0 0 0 0 0 2 1 0 0 0 0 19R
50
1 10 * U-235* * U-238* 2.0E-5 1.0526E-6
10
-1 0 19R

```

(CONT)

STOP
END
CUTLIN
DTNINS

	0	6	0	72		50.	+6	.9E		1.0
C	1			2	1		1		50	
			1				1			

RODINS
C.C

	0	1	0	12						
0 0	1	0	0	0	2	0	0	0	0	1
EXPINS	0	6	0	24						
85.0										
	0	0	1	2						

ELANK
END

CUTLIN
DTNINS

	0	6	0	72		50.	+6	.9E		1.0
C				2			1		50	
			0				1			

ELANK
END

CUTLIN
RODINS

	0	1	0	12						
C.C										
0 0	1	0	0	0	0	2	0	-0	0	1

ELANK
END

/*
//

0900 VICTIM'S VEHICLE RAN AT SPEED OF APPROXIMATELY 60 MPH INTO THE CONTROL WALL AND STOPPED. DATE/TIME OF CRASH: 11/28/80 TIME: 11:24:40 J. PLANE: 107A

1. *Journal of the American Medical Association*, 1997; 277: 1039-1043.

[illegible][illegible]

1	2	12	3	43	5	43	2	12	3	12	1	15
---	---	----	---	----	---	----	---	----	---	----	---	----

FILE NUMBER	DATE	TIME	BY
10	10/10/50	10:00	1

HEAD DATA FOR A SPECIAL DECOMPOSE - CONTAINING 12% 47,12, 500 MIN 0.9

ACCESS DELETED ROUTINE - CONTAINING 1701 A7, 10, 203 MINS 2, 16

DEAD INQUIRY CASE ONLY (LOOK-ALIKE) - CONTINUING 1201 44,00, 100 MINE 1, 10

ACCESS MODES 1 2 3 4 5 = REMAINING I/O = 47,934 CPU MINS = 10.40

2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 2681, 26

ACCESS POINTS TO ROUTING - REMAINING 17" = 47.44, CRU MIN = 7.40

READ INPUT DATA ONLY (FLOW-AM-AD) - REMAINING 1/27 46.40, CPU TIME 0.74

```

***** REMAINING I/Os: 44,44, CPU MINS: 2.7M
***** CPU OF M101: 0.00% TIME: 1.1 CYCLE, BRAC-IN CYCLE: 1

```

ADDRESS: BOSTON OFFICE	REMAINING LOTS: 11-34 CPU TIME: 0.78
------------------------	--------------------------------------

CYCLE, CNT, DT, IN HIST, CYCLE TIME, TIME IN CYCLE, FRAC IN CYCLE, I

APPROX DEPRESSION ROUTE IN 1 REMAINING 1705 47.03, 00U MIN 1.70

DEAD INDIY DATA ONLY (LOOK-AHEAD) = REMAINING I/O- 45.73, CPU 1148 3.64

ACCESS MODULES 11 2 6 0 0 * REMAINING 1403 A5.89, CPU MIN 4.67

CYCLE, DD%, DT%, IN HIST, CYCLE TIME, TIME IN CYCLE, FRAC, IN CYCLE= 1

ACCESS COMPLETION OUTPUT IN: - REMAINING I/O: 15.7%, CPU MIN: 9.4%

OFAD INPUT DATA ONLY (LOOK-AHEAD) - REMAINING I/Os 45.62, CPU MINUS 2.63

ACCESS MODULES 12 0 0 0 - REMAINING 1/0s 88.44, CPU MIN 9.62

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1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 26

CLF, DPT, PT, IN HIST, CYCLE TIME, TIME IN CYCLE, PRAC, IN CYCLE- 1

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62

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FIGURE 6. SELECTED OUTPUT FOR THE SAMPLE PROBLEMS

1. The first step is to identify the problem or question that needs to be addressed. This involves understanding the context and the specific requirements of the task.

[illegible]

THE UNIVERSITY OF CHICAGO

5:14:14 PM - A few individuals were noticed at home.

21 2 21 2 21 2 21 2 1

NUMBER IN THE APPROXIMATE PERIOD

Journal of the Management Academy

5767 NAME: 2100118 000

[illegible]

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DATE 08-09-2001 BY SP-6 BTJ/KJS

[illegible]

THE

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APPROXIMATELY 12,000 REMAINING IN THE AREA - REMAINING IN THE AREA - REMAINING IN THE AREA

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[illegible]

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FEDERAL BUREAU OF INVESTIGATION
WASHINGTON, D.C. 20535

U.S. DEPARTMENT OF JUSTICE
FEDERAL BUREAU OF INVESTIGATION
WASHINGTON, D.C. 20535

100-443887-100

44-38861-1000

RE: ENIN NDJ 19240 EULI GININWAM - (USAMV-NOU) AML WAS ALMOI WASE

ACCESS NUMBER 12 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040

1. The first step is to identify the problem or goal. This involves understanding the current situation, identifying the problem, and setting a clear goal. For example, if the goal is to increase sales, the first step would be to identify the current sales level and the factors that are affecting it.

WATER RESOURCES DIVISION
- DAMAGING FLOODS -
MINIMUM 100,000,000

SECRET - (UNCLASSIFIED) AND NOT FOR DISTRIBUTION OUTSIDE THE COMINT DIVISION

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===== 1 0 0 0 - remaining 1/0= 49.89 CPU time 9.67
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1 -27222 MI 07004 ' 27222 MI 4MI4 '4MI4 27222 '451M MI'00 '000 '07242

ACCUSEE CONFESSING TO THE CRIME - 9,440

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AVCCT, WBY, 07,14 M197, CYCLO TIME, TIME IN CYCLES, ROAD IN CYCLES - 1

DATE	DESCRIPTION	AMOUNT	BALANCE
10-1-58	100.00	100.00	100.00
10-2-58	100.00	200.00	200.00
10-3-58	100.00	300.00	300.00
10-4-58	100.00	400.00	400.00
10-5-58	100.00	500.00	500.00
10-6-58	100.00	600.00	600.00
10-7-58	100.00	700.00	700.00
10-8-58	100.00	800.00	800.00
10-9-58	100.00	900.00	900.00
10-10-58	100.00	1000.00	1000.00
10-11-58	100.00	1100.00	1100.00
10-12-58	100.00	1200.00	1200.00
10-13-58	100.00	1300.00	1300.00
10-14-58	100.00	1400.00	1400.00
10-15-58	100.00	1500.00	1500.00
10-16-58	100.00	1600.00	1600.00
10-17-58	100.00	1700.00	1700.00
10-18-58	100.00	1800.00	1800.00
10-19-58	100.00	1900.00	1900.00
10-20-58	100.00	2000.00	2000.00
10-21-58	100.00	2100.00	2100.00
10-22-58	100.00	2200.00	2200.00
10-23-58	100.00	2300.00	2300.00
10-24-58	100.00	2400.00	2400.00
10-25-58	100.00	2500.00	2500.00
10-26-58	100.00	2600.00	2600.00
10-27-58	100.00	2700.00	2700.00
10-28-58	100.00	2800.00	2800.00
10-29-58	100.00	2900.00	2900.00
10-30-58	100.00	3000.00	3000.00
10-31-58	100.00	3100.00	3100.00
11-1-58	100.00	3200.00	3200.00
11-2-58	100.00	3300.00	3300.00
11-3-58	100.00	3400.00	3400.00
11-4-58	100.00	3500.00	3500.00
11-5-58	100.00	3600.00	3600.00
11-6-58	100.00	3700.00	3700.00
11-7-58	100.00	3800.00	3800.00
11-8-58	100.00	3900.00	3900.00
11-9-58	100.00	4000.00	4000.00
11-10-58	100.00	4100.00	4100.00
11-11-58	100.00	4200.00	4200.00
11-12-58	100.00	4300.00	4300.00
11-13-58	100.00	4400.00	4400.00
11-14-58	100.00	4500.00	4500.00
11-15-58	100.00	4600.00	4600.00
11-16-58	100.00	4700.00	4700.00
11-17-58	100.00	4800.00	4800.00
11-18-58	100.00	4900.00	4900.00
11-19-58	100.00	5000.00	5000.00
11-20-58	100.00	5100.00	5100.00
11-21-58	100.00	5200.00	5200.00
11-22-58	100.00	5300.00	5300.00
11-23-58	100.00	5400.00	5400.00
11-24-58	100.00	5500.00	5500.00
11-25-58	100.00	5600.00	5600.00
11-26-58	100.00	5700.00	5700.00
11-27-58	100.00	5800.00	5800.00
11-28-58	100.00	5900.00	5900.00
11-29-58	100.00	6000.00	6000.00
11-30-58	100.00	6100.00	6100.00
12-1-58	100.00	6200.00	6200.00
12-2-58	100.00	6300.00	6300.00
12-3-58	100.00	6400.00	6400.00
12-4-58	100.00	6500.00	6500.00
12-5-58	100.00	6600.00	6600.00
12-6-58	100.00	6700.00	6700.00
12-7-58	100.00	6800.00	6800.00
12-8-58	100.00	6900.00	6900.00
12-9-58			

DATE	TIME	LOCATION	WIND	WAVE	SEA	TEMP	WIND	WAVE	SEA	TEMP
12	00	0	0	0	0	0	0	0	0	0
13	00	0	0	0	0	0	0	0	0	0
14	00	0	0	0	0	0	0	0	0	0
15	00	0	0	0	0	0	0	0	0	0
16	00	0	0	0	0	0	0	0	0	0
17	00	0	0	0	0	0	0	0	0	0
18	00	0	0	0	0	0	0	0	0	0
19	00	0	0	0	0	0	0	0	0	0
20	00	0	0	0	0	0	0	0	0	0
21	00	0	0	0	0	0	0	0	0	0
22	00	0	0	0	0	0	0	0	0	0
23	00	0	0	0	0	0	0	0	0	0
24	00	0	0	0	0	0	0	0	0	0
25	00	0	0	0	0	0	0	0	0	0
26	00	0	0	0	0	0	0	0	0	0
27	00	0	0	0	0	0	0	0	0	0
28	00	0	0	0	0	0	0	0	0	0
29	00	0	0	0	0	0	0	0	0	0
30	00	0	0	0	0	0	0	0	0	0
31	00	0	0	0	0	0	0	0	0	0
32	00	0	0	0	0	0	0	0	0	0
33	00	0	0	0	0	0	0	0	0	0
34	00	0	0	0	0	0	0	0	0	0
35	00	0	0	0	0	0	0	0	0	0
36	00	0	0	0	0	0	0	0	0	0
37	00	0	0	0	0	0	0	0	0	0
38	00	0	0	0	0	0	0	0	0	0
39	00	0	0	0	0	0	0	0	0	0
40	00	0	0	0	0	0	0	0	0	0
41	00	0	0	0	0	0	0	0	0	0
42	00	0	0	0	0	0	0	0	0	0
43	00	0	0	0	0	0	0	0	0	0
44	00	0	0	0	0	0	0	0	0	0
45	00	0	0	0	0	0	0	0	0	0
46	00	0	0	0	0	0	0	0	0	0
47	00	0	0	0	0	0	0	0	0	0
48	00	0	0	0	0	0	0	0	0	0
49	00	0	0	0	0	0	0	0	0	0
50	00	0	0	0	0	0	0	0	0	0
51	00	0	0	0	0	0	0	0	0	0
52	00	0	0	0	0	0	0	0	0	0
53	00	0	0	0	0	0	0	0	0	0
54	00	0	0	0	0	0	0	0	0	0
55	00	0	0	0	0	0	0	0	0	0
56	00	0	0	0	0	0	0	0	0	0
57	00	0	0	0	0	0	0	0	0	0
58	00	0	0	0						

CYCLE, NOV, 27, IN MIST, CYCLE TIME, TIME IN CYCLE, 0000. IN CYCLE-

FINAL 1971 MANAGEMENT TABLES

 

ACCESS MODULES 12 7 0 0 0 - REMAINING I/O= 35.00, CPU MIN= 7.01
CYCLE, OPT, ST, IN MIST, CYCLE TIME, TIME IN CYCLE, PRAC, IN CYCLE- 1 4 4 0.0
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 10 -4.94280-06 0.0
RELATIVE CONVERSION RATIO, ALSO FOR CRITICAL SYSTEM, FUEL CONSUMPTION(ATOMS/WATT-SEC) - 1.16617 1.16160 3.00920E 10

ACCESS PROCESSOR 'OUTLINE'
- REMAINING I/O= 33.45, CPU MIN= 7.47
BEAN INPUT DATA ONLY (LOOK-AMPA) - REMAINING I/O= 33.40, CPU MIN= 7.45

ACCESS MODULES 12 7 0 0 0 - REMAINING I/O= 33.45, CPU MIN= 7.45
CYCLE, OPT, ST, IN MIST, CYCLE TIME, TIME IN CYCLE, PRAC, IN CYCLE- 1 5 5 0.0
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 10 -1.05780-05 0.0
RELATIVE CONVERSION RATIO, ALSO FOR CRITICAL SYSTEM, FUEL CONSUMPTION(ATOMS/WATT-SEC) - 1.13050 1.20022 3.12000E 10

ACCESS PROCESSOR 'OUTLINE'
- REMAINING I/O= 31.00, CPU MIN= 7.01
BEAN INPUT DATA ONLY (LOOK-AMPA) - REMAINING I/O= 31.03, CPU MIN= 7.00

ACCESS MODULES 12 7 0 0 0 - REMAINING I/O= 31.70, CPU MIN= 6.99
CYCLE, OPT, ST, IN MIST, CYCLE TIME, TIME IN CYCLE, PRAC, IN CYCLE- 1 5 5 0.0
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 10 -4.20020-05 0.0
RELATIVE CONVERSION RATIO, ALSO FOR CRITICAL SYSTEM, FUEL CONSUMPTION(ATOMS/WATT-SEC) - 1.10000 1.02001 3.00000E 10

ACCESS PROCESSOR 'OUTLINE'
- REMAINING I/O= 30.25, CPU MIN= 6.95
BEAN INPUT DATA ONLY (LOOK-AMPA) - REMAINING I/O= 30.15, CPU MIN= 6.94

ACCESS MODULES 12 7 0 0 0 - REMAINING I/O= 30.15, CPU MIN= 6.94
CYCLE, OPT, ST, IN MIST, CYCLE TIME, TIME IN CYCLE, PRAC, IN CYCLE- 1 -3 0 0.0
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 10 -2.46750-05 0.0
RELATIVE CONVERSION RATIO, ALSO FOR CRITICAL SYSTEM, FUEL CONSUMPTION(ATOMS/WATT-SEC) - 1.10000 1.02777 3.00000E 10
ADJUST - ITERATIONS, CONVERGENCE, K - 10 -4.20020-05 0.00000
FUEL CONSUMPTION RATIO, ALSO FOR CRITICAL SYSTEM, FUEL CONSUMPTION RATIO 0.0 K0/W-SEC

FILE NAME: OUTLINE.DAT

FILE NAME	TYPE	UNRECORDED	US D-SPACE	VERSION	WRITTEN
10	CONTROL			1	1
11	PROCESS			1	1
12	ITERATE			1	1
13	SEARCH			1	1
14	CONVGE			1	1
15	UNRECOR			1	1
16	PRACIN			1	1
17	TIMEIN			1	1
18	PEAKPOW			1	1
19	FUELCON			1	1
20	RELCONV			1	1
21	ADJUST			1	1

REMAINING I/O= 30.15, CPU MIN= 6.94, BEAN INPUT DATA ONLY (LOOK-AMPA) - REMAINING I/O= 30.05, CPU MIN= 6.94 - TIME=11.30.7

 

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IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

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1. The first step is to identify the problem or goal. This involves understanding the current situation, the desired outcome, and the constraints. It is important to be clear and specific about what you want to achieve.

1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 26

APR 25 1968

DEAR MURPHY: MAYA WAS A REMAINING 10/25 20.33. CRU MIN = 6.10

[illegible]

SECRET
REF ID: A66544

[illegible]

2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2360 2361 2362 2363 2364 2365 2366 2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379 2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392 2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405 2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444 2445 2446 2447 2448 2449 2450 2451 2452 2453 2454 2455 2456 2457 2458 2459 2460 2461 2462 2463 2464 2465 2466 2467 2468 2469 2470 2471 2472 2473 2474 2475 2476 2477 2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496 2497 2498 2499 2500 2501 2502 2503 2504 2505 2506 2507 2508 2509 2510 2511 2512 2513 2514 2515 2516 2517 2518 2519 2520 2521 2522 2523 2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540 2541 2542 2543 2544 2545 2546 2547 2548 2549 2550 2551 2552 2553 2554 2555 2556 2557 2558 2559 2560 2561 2562 2563 2564 2565 2566 2567 2568 2569 2570 2571 2572 2573 2574 2575 2576 2577 2578 2579 2580 2581 2582 2583 2584 2585 2586 2587 2588 2589 2590 2591 2592 2593 2594 2595 2596 2597 2598 2599 2600 2601 2602 2603 2604 2605 2606 2607 2608 2609 2610 2611 2612 2613 2614 2615 2616 2617 2618 2619 2620 2621 2622 2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638 2639 2640 2641 2642 2643 2644 2645 2646 2647 2648 2649 2650 2651 2652 2653 2654 2655 2656 2657 2658 2659 2660 2661 2662 2663 2664 2665 2666 2667 2668 2669 2670 2671 2672 2673 2674 2675 2676 2677 2678 2679 2680 2681 2682 2683 2684 2685 2686 2687 2688 2689 2690 2691 2692 2693 2694 2695 2696 2697 2698 2699 2700 2701 2702 2703 2704 2705 2706 2707 2708 2709 2710 2711 2712 2713 2714 2715 2716 2717 2718 2719 2720 2721 2722 2723 2724 2725 2726 2727 2728 2729 2730 2731 2732 2733 2734 2735 2736 2737 2738 2739 2740 2741 2742 2743 2744 2745 2746 2747 2748 2749 2750 2751 2752 2753 2754 2755 2756 2757 2758 2759 2760 2761 2762 2763 2764 2765 2766 2767 2768 2769 2770 2771 2772 2773 2774 2775 2776 2777 2778 2779 2780 2781 2782 2783 2784 2785 2786 2787 2788 2789 2790 2791 2792 2793 2794 2795 2796 2797 2798 2799 2800 2801 2802 2803 2804 2805 2806 2807 2808 2809 2810 2811 2812 2813 2814 2815 2816 2817 2818

[illegible][illegible][illegible]

RECEIVED BY THE DIRECTOR OF THE FBI
JAN 20 1961

SECRET
REF ID: A68097

100-44401 - CONTINUING INFO
1931, CONFINED

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access modules 13 0 0 0 - evaluating / no 10.8K CPU min= 6.12  
time above threshold 100.000 days, estimated x 2.03319; fissile inventory 5.48956E+01 kg; conversion ratio(inf) 0.3000
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DATE	TIME	LOCATION	REMARKS
10-11-58	10:00	10-11-58	10:00

[illegible][illegible]

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          - REMAINING I/Os 1769, CPU time
CPU%   MBK, MBKIN MBY, CYCLP TYP, TIM IN CYCLP, PRC IN CYCLP- 1 0 3 3.00000E 02 8.00000E 02 0.66667

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[illegible]

THE ABOVE FIGURES 300,000 OUNCE, ESTIMATED BY C. W. B. & SONS, POSSIBLE INVENTING AGENTS OF THE COMMISSION MATIUM, 1900.

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ACBDDCZ          09 12  7  0  0  0 - REMAINING I/Os 15.06, CPU time 4.81
CYCLE, conv, pr.in mist, cycle time, %imp in cycle, frac.in cycle- 1 0 4 3.00000E 02 3.00000E 02 1.000000

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ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K = 15 -0.004380-05 0.0 0.007992 00 1.0000100
RELATIVE CONVERSION RATIO, ALSO FOR CRITICAL SYSTEM, FUEL CONSUMPTION(ATOMS/WATT-SEC) - 0.01307 0.01883 3.00001E 10

ACCESS PROCESSOR 'DOUTLIN' - REMAINING I/O: 10.00, CPU MIN: 0.27

ACCESS MODULES 12 7 0 0 - REMAINING I/O: 10.00, CPU MIN: 0.25
CYCLE, NET, ST-IN MIST, CYCLE TIME, TIME IN CYCLE, PRAC-IN CYCLE- 1 -4 0 3.000007 02 3.000007 02 1.000000
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K = 15 -0.013120-07 0.0 7.010722 00 0.0770530
RELATIVE CONVERSION RATIO, ALSO FOR CRITICAL SYSTEM, FUEL CONSUMPTION(ATOMS/WATT-SEC) - 0.04434 0.016978 3.01103E 10
ADJOINT - ITERATIONS, CONVERGENCE, K = 13 -0.045620-05 0.0770530
ADJOINT NEUTRON LIFETIME,  $\lambda$ /(INTEGRAL(CMT, MUSEI(PH, PHEI))) - 0.0770530
FISSILE INVENTORY 4.000000E 01 KG, CONVERSION RATIO: 0.41302, FISSILE CONSUMPTION RATE 1.010000E-10 KG/W-SEC

READ DATA AND ACCESS MODULE 99 - REMAINING I/O: 11.07, CPU MIN: 3.00
READ DATA AND ACCESS MODULE 1 - REMAINING I/O: 11.71, CPU MIN: 3.06
READ DATA AND A SPECIAL PROCESSOR - REMAINING I/O: 11.94, CPU MIN: 3.06
ACCESS PROCESSOR 'DOUTLIN' - REMAINING I/O: 11.92, CPU MIN: 3.04
READ INPUT DATA ONLY (LOOK-AHEAD) - REMAINING I/O: 11.00, CPU MIN: 3.03
ACCESS MODULES 7 0 0 0 - REMAINING I/O: 11.30, CPU MIN: 3.02
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K = 26 -3.100000-04 2.36933E-01 0.029958 00 1.0000000
RELATIVE CONVERSION RATIO, ALSO FOR CRITICAL SYSTEM, FUEL CONSUMPTION(ATOMS/WATT-SEC) - 0.37001 0.37001 3.00000E 10
TIME ABOVE THRESHOLD 450.000 DAYS, ESTIMATED K 3.00000, FISSILE INVENTORY 4.143010E 01 KG, CONVERSION RATIO: 0.30000

ACCESS PROCESSOR 'DOUTLIN' - REMAINING I/O: 0.00, CPU MIN: 3.05
READ INPUT DATA ONLY (LOOK-AHEAD) - REMAINING I/O: 0.00, CPU MIN: 3.04
ACCESS MODULES 13 0 0 0 - REMAINING I/O: 0.00, CPU MIN: 3.03
TIME ABOVE THRESHOLD 300.000 DAYS, ESTIMATED K 0.33000, FISSILE INVENTORY 4.000000E 01 KG, CONVERSION RATIO: 0.30000

ACCESS MODULES 12 7 13 0 - REMAINING I/O: 0.00, CPU MIN: 3.00
CYCLE, NET, ST-IN MIST, CYCLE TIME, TIME IN CYCLE, PRAC-IN CYCLE- 1 0 1 0.0 3.000007 02 0.0 0.000007 02 0.0
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K = 16 1.003700-01 0.0 0.000007 02 0.000007 02 0.000007 02
RELATIVE CONVERSION RATIO, ALSO FOR CRITICAL SYSTEM, FUEL CONSUMPTION(ATOMS/WATT-SEC) - 3.00000 0.00000 3.00000E 10
TIME ABOVE THRESHOLD 450.000 DAYS, ESTIMATED K 3.00000, FISSILE INVENTORY 4.143010E 01 KG, CONVERSION RATIO: 0.30000

ACCESS MODULES 12 7 13 0 - REMAINING I/O: 0.00, CPU MIN: 3.00
CYCLE, NET, ST-IN MIST, CYCLE TIME, TIME IN CYCLE, PRAC-IN CYCLE- 1 0 2 0.0 0.000007 02 0.0 0.000007 02 0.0
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K = 17 1.000000-04 0.0 0.000007 02 0.000007 02 0.000007 02
RELATIVE CONVERSION RATIO, ALSO FOR CRITICAL SYSTEM, FUEL CONSUMPTION(ATOMS/WATT-SEC) - 0.00000 0.00000 3.00000E 10
TIME ABOVE THRESHOLD 450.000 DAYS, ESTIMATED K 0.00000, FISSILE INVENTORY 4.000000E 01 KG, CONVERSION RATIO: 0.30000

ACCESS MODULES 12 7 0 0 - REMAINING I/O: 7.10, CPU MIN: 3.11
CYCLE, NET, ST-IN MIST, CYCLE TIME, TIME IN CYCLE, PRAC-IN CYCLE- 1 0 3 0.0 0.000007 02 0.0 0.000007 02 0.0
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K = 18 1.000000-04 0.0 0.000007 02 0.000007 02 0.000007 02
RELATIVE CONVERSION RATIO, ALSO FOR CRITICAL SYSTEM, FUEL CONSUMPTION(ATOMS/WATT-SEC) - 0.00000 0.00000 3.00000E 10
TIME ABOVE THRESHOLD 450.000 DAYS, ESTIMATED K 0.00000, FISSILE INVENTORY 4.000000E 01 KG, CONVERSION RATIO: 0.30000

ACCESS PROCESSOR 'DOUTLIN' - REMAINING I/O: 0.00, CPU MIN: 3.06
ACCESS MODULES 12 7 0 0 - REMAINING I/O: 0.00, CPU MIN: 3.04
CYCLE, NET, ST-IN MIST, CYCLE TIME, TIME IN CYCLE, PRAC-IN CYCLE- 1 -4 0 3.0 0.000007 02 0.0 0.000007 02 0.0
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K = 12 0.000000-04 0.0 0.000007 02 0.000007 02 0.000007 02
RELATIVE CONVERSION RATIO, ALSO FOR CRITICAL SYSTEM, FUEL CONSUMPTION(ATOMS/WATT-SEC) - 0.00000 0.00000 3.00000E 10
FISSILE INVENTORY 4.000000E 01 KG, CONVERSION RATIO: 0.00000, FISSILE CONSUMPTION RATE 1.010000E-10 KG/W-SEC

```

FILE NAME: C:\MS-DOS\SYSTEM\SYSTEM.MAN

FILE NAME: C:\MS-DOS\SYSTEM\SYSTEM.MAN

FILE NAME	TYPE	UNIT	VALUE	UNIT
12	DATA	1	1	1
13	DATA	1	1	1
14	DATA	1	1	1

 
COUNCIL ON
ADULT EDUCATION
WASHINGTON, D.C.

NAME WAS NOT OBTAINED SUCCESSFULLY FROM INTERFACE FILE. CRYSTAL ZMATION AND QUALITY (VERSION 1.0)

THE ABOVE LISTED INFORMATION HAS BEEN OBTAINED FROM THE FOLLOWING SOURCE:

UNITED STATES DEPARTMENT OF JUSTICE
FEDERAL BUREAU OF INVESTIGATION
WASHINGTON, D. C. 20535

STATE OF NEW YORK
IN SENATE
January 11, 1917.

[illegible]

AC-PCS W. CCLP MU. C.O.P. DPT. AT IN HIST. XXXXXXXXXXXXXXXXXXXXXXXX MEMPHYS AUTO

100-90000

1. The first part of the paper discusses the importance of the role of the state in the development of the economy. It argues that the state should play a leading role in the development of the economy, particularly in the areas of infrastructure, education, and health care. The state should also play a role in the development of the private sector, particularly in the areas of research and development, and in the provision of social services.

[illegible][illegible]

2012 - 2013

1. The following information was obtained from the records of the Department of the Interior, Bureau of Land Management, regarding the land owned by the United States in the State of Nevada:

2. Are there any updates on the following issues?

[illegible]

THE INFORMATION HAS NOT YET BEEN RECEIVED FROM THE
NUMBER OF ZONES : 6 (08) JUNE : 3 LAST TIME = 10

02 - JMOZ LSVY P1 - ZMWZ LSVLD 6 - SENCZ JO QZBGRH 2 - LSY RHH BOO HCLJLWZDHL (SWV) WDE *

... AND) INCREASING FOR MAY SEP = 3 NUMBER OF ZONES = 9 FIRST ZONE = 22 LAST ZONE = 36

SAINT JOHN'S COLLEGE, NEW YORK

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0.8	0.8	1.75	6.9	11
1.75	1.75	1.75	6.9	11
6.9	6.9	6.9	6.9	11
11	11	11	11	11

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0.0	1.704	60	200000.1	1

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9 AUGUST 1 105 2PM HI & F

MOD31	1.000000	00	POLL 1	0.0
ZONE 8	IN W02 SET	1	ENTRY 7	
MOD31	1.000000	00	POLL 1	0.0
ZONE 9	IN W02 SET	1	ENTRY 8	
MOD31	1.000000	00	POLL 1	0.0
ZONE 10	IN W02 SET	1	ENTRY 9	
MOD31	1.000000	00	POLL 1	0.0
ZONE 11	IN W02 SET	2	ENTRY 10	
MOD32	2.000000	00	POLL 2	0.0
ZONE 12	IN W02 SET	2	ENTRY 11	
MOD32	2.000000	00	POLL 2	0.0
ZONE 13	IN W02 SET	2	ENTRY 12	
MOD32	2.000000	00	POLL 2	0.0
ZONE 14	IN W02 SET	2	ENTRY 13	
MOD32	2.000000	00	POLL 2	0.0
ZONE 15	IN W02 SET	2	ENTRY 14	
MOD32	2.000000	00	POLL 2	0.0
ZONE 16	IN W02 SET	2	ENTRY 15	
MOD32	2.000000	00	POLL 2	0.0
ZONE 17	IN W02 SET	2	ENTRY 16	
MOD32	2.000000	00	POLL 2	0.0
ZONE 18	IN W02 SET	2	ENTRY 17	
MOD32	2.000000	00	POLL 2	0.0
ZONE 19	IN W02 SET	2	ENTRY 18	
MOD32	2.000000	00	POLL 2	0.0
ZONE 20	IN W02 SET	2	ENTRY 19	
MOD32	2.000000	00	POLL 2	0.0
ZONE 21	IN W02 SET	3	ENTRY 20	
MOD33	3.000000	00	POLL 3	0.0
ZONE 22	IN W02 SET	3	ENTRY 21	
MOD33	3.000000	00	POLL 3	0.0
ZONE 23	IN W02 SET	3	ENTRY 22	
MOD33	3.000000	00	POLL 3	0.0
ZONE 24	IN W02 SET	3	ENTRY 23	
MOD33	3.000000	00	POLL 3	0.0
ZONE 25	IN W02 SET	3	ENTRY 24	
MOD33	3.000000	00	POLL 3	0.0
ZONE 26	IN W02 SET	3	ENTRY 25	
MOD33	3.000000	00	POLL 3	0.0
ZONE 27	IN W02 SET	3	ENTRY 26	
MOD33	3.000000	00	POLL 3	0.0
ZONE 28	IN W02 SET	3	ENTRY 27	
MOD33	3.000000	00	POLL 3	0.0
ZONE 29	IN W02 SET	3	ENTRY 28	
MOD33	3.000000	00	POLL 3	0.0
ZONE 30	IN W02 SET	3	ENTRY 29	
MOD33	3.000000	00	POLL 3	0.0
ZONE 31	IN W02 SET	3	ENTRY 30	
MOD33	3.000000	00	POLL 3	0.0

DETAILED INTERPRETATION DATA FILE SYNTAX HAS BEEN WRITTEN AFTER THIS POSITIONING SPECIFICATION ON UNIT 16

0 TRAVEL - 100%
0 MEALS - 100%
0 LODGING - 100%
0 TRANSPORTATION - 100%
0 OTHER - 100%

[illegible]

DATA HAS BEEN DEVELOPED SUCCESSFULLY FROM INTERFACE FILE	CONTROL	REQUEST	ADDRESS	INMACH	AND METHODS (VERSION 1)
THE FOLLOWING RECORDS ON FILE CONTROL HAVE NOT YET PROCESSED					
CONTAINS NO RECORDS BECAUSE OF NO FILE CONTROL					

(19)X	0	0	0	0	0	0	0	0	0
(8)X	0	0	0	0	0	0	0	0	0
(7)X	0	0	0	0	0	0	0	0	0
(6)X	0	0	0	0	0	0	0	0	0
(5)X	0	0	0	0	0	0	0	0	0
(4)X	0	0	0	0	0	0	0	0	0
(3)X	0	0	0	0	0	0	0	0	0
(2)X	0	0	0	0	0	0	0	0	0
(1)X	0	0	0	0	0	0	0	0	0

[illegible]

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED

2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963	1962	1961	1960	1959	1958	1957	1956	1955	1954	1953	1952	1951	1950	1949	1948	1947	1946	1945	1944	1943	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929	1928	1927	1926	1925	1924	1923	1922	1921	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	1910	1909	1908	1907	1906	1905	1904	1903	1902	1901	1900	1899	1898	1897	1896	1895	1894	1893	1892	1891	1890	1889	1888	1887	1886	1885	1884	1883	1882	1881	1880	1879	1878	1877	1876	1875	1874	1873	1872	1871	1870	1869	1868	1867	1866	1865	1864	1863	1862	1861	1860	1859	1858	1857	1856	1855	1854	1853	1852	1851	1850	1849	1848	1847	1846	1845	1844	1843	1842	1841	1840	1839	1838	1837	1836	1835	1834	1833	1832	1831	1830	1829	1828	1827	1826	1825	1824	1823	1822	1821	1820	1819	1818	1817	1816	1815	1814	1813	1812	1811	1810	1809	1808	1807	1806	1805	1804	1803	1802	1801	1800	1799	1798	1797	1796	1795	1794	1793	1792	1791	1790	1789	1788	1787	1786	1785	1784	1783	1782	1781	1780	1779	1778	1777	1776	1775	1774	1773	1772	1771	1770	1769	1768	1767	1766	1765	1764	1763	1762	1761	1760	1759	1758	1757	1756	1755	1754	1753	1752	1751	1750	1749	1748	1747	1746	1745	1744	1743	1742	1741	1740	1739	1738	1737	1736	1735	1734	1733	1732	1731	1730	1729	1728	1727	1726	1725	1724	1723	1722	1721	1720	1719	1718	1717	1716	1715	1714	1713	1712	1711	1710	1709	1708	1707	1706	1705	1704	1703	1702	1701	1700	1699	1698	1697	1696	1695	1694	1693	1692	1691	1690	1689	1688	1687	1686	1685	1684	1683	1682	1681	1680	1679	1678	1677	1676	1675	1674	1673	1672	1671	1670	1669	1668	1667	1666	1665	1664	1663	1662	1661	1660	1659	1658	1657	1656	1655	1654	1653	1652	1651	1650	1649	1648	1647	1646	1645	1644	1643	1642	1641	1640	1639	1638	1637	1636	1635	1634	1633	1632	1631	1630	1629	1628	1627	1626	1625	1624	1623	1622	1621	1620	1619	1618	1617	1616	1615	1614	1613	1612	1611	1610	1609	1608	1607	1606	1605	1604	1603	1602	1601	1600	1599	1598	1597	1596	1595	15
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15006				00	1700	0.0
5005			1.000000	00		

0-0-0 11000 00 20000-1 15000
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AGENCY 1 445 2004 MI 0

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• SIMULTANEOUSLY WITH THE PREPARATION OF THE

AND HAVE BEEN RECEIVED SUCCESSFULLY FROM INTERFACE FILMS CONTROL PRODUCTS 40X501 ZNATON AND GE 1047 (VERSION 1)

THE FOLLOWING REPORT WILL CONTAIN MANY UNCLASSIFIED
REMARKS FROM THE REPORTING OFFICER'S PERSONAL
EXPERIENCE AND WILL NOT BE USED FOR
ADDITIONAL REPORTING PURPOSES

CONFIDENTIAL - SECURITY INFORMATION

[illegible][illegible]

WELING POSITION IN NO-FOLLOW ZONE

10 30060001	1 1700	0.0	10000
1	Amid	1	25 20000
			2

10 000000 1 1702 000 15000
2 000000 1 000 200 000 1 4000

4 12 402 307 1 PM704 3

4 ADAM 1 405 200 MI 5 0000

W. Adams 1 Add 200 H1 2

9 AMMA 1 435 264 MI - 24004

FROM 2 IN 427 1 ENTRY 7

[illegible]

10	00000000.1	1.7394	0.0	15900
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Z0W 10 14 W02 SET 1 ENTRY 9
W0D51 0.0 POLL 1 1.000000 01

Z0W 12 14 W02 SET 2 ENTRY 11
W0D52 0.0 POLL 2 2.000000 01

Z0W 13 14 W02 SET 2 ENTRY 12
W0D53 0.0 POLL 2 2.000000 01

Z0W 14 14 W02 SET 2 ENTRY 13
W0D54 0.0 POLL 2 2.000000 01

Z0W 15 14 W02 SET 2 ENTRY 14
W0D55 0.0 POLL 2 2.000000 01

Z0W 16 14 W02 SET 2 ENTRY 15
W0D56 0.0 POLL 2 2.000000 01

Z0W 17 14 W02 SET 2 ENTRY 16
W0D57 0.0 POLL 2 2.000000 01

Z0W 18 14 W02 SET 2 ENTRY 17
W0D58 0.0 POLL 2 2.000000 01

Z0W 19 14 W02 SET 2 ENTRY 18
W0D59 0.0 POLL 2 2.000000 01

Z0W 20 14 W02 SET 2 ENTRY 19
W0D60 0.0 POLL 2 2.000000 01

Z0W 21 14 W02 SET 3 ENTRY 21
W0D61 0.0 POLL 3 3.000000 01

Z0W 22 14 W02 SET 3 ENTRY 22
W0D62 0.0 POLL 3 3.000000 01

Z0W 23 14 W02 SET 3 ENTRY 23
W0D63 0.0 POLL 3 3.000000 01

Z0W 24 14 W02 SET 3 ENTRY 24
W0D64 0.0 POLL 3 3.000000 01

Z0W 25 14 W02 SET 3 ENTRY 25
W0D65 0.0 POLL 3 3.000000 01

Z0W 26 14 W02 SET 3 ENTRY 26
W0D66 0.0 POLL 3 3.000000 01

Z0W 27 14 W02 SET 3 ENTRY 27
W0D67 0.0 POLL 3 3.000000 01

Z0W 28 14 W02 SET 3 ENTRY 28
W0D68 0.0 POLL 3 3.000000 01

Z0W 29 14 W02 SET 3 ENTRY 29
W0D69 0.0 POLL 3 3.000000 01

Z0W 30 14 W02 SET 3 ENTRY 30
W0D70 0.0 POLL 3 3.000000 01

Z0W 31 14 W02 SET 4 ENTRY 31 CLOSURE-NOV SET
W0D71 1.000000 01 ST0UC 1.000000 02 ALL 24 3.0

Z0W 32 14 W02 SET 4 ENTRY 32 CLOSURE-NOV SET
W0D72 2.000000 01 ST0UC 2.000000 02 ALL 24 3.0

Z0W 33 14 W02 SET 4 ENTRY 33 CLOSURE-NOV SET
W0D73 3.000000 01 ST0UC 3.000000 02 ALL 24 3.0

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RODNET CONTROL ROD POSITIONING MODULE - VERSION 1 - JULY 1, 1974 - QUALITY ASSURANCE LEVEL 0

RUN TITLE - UNKNOWN SAMPLE PROBLEM 1, ROD POSITIONING ONLY - NO NEUTRONICS.

DATA HAS BEEN RETRIEVED SUCCESSFULLY FROM INTERFACE FILE'S CONTROL RODSET NO.1547 ZNATON AND GRIDSET (VERSION 1)

THE FOLLOWING RECORDS ON FILE CONTROL HAVE BEEN PROCESSED DURING PRELIM. RUNNING

CONTENT OF RUNNING RECORD OF FILE CONTROL

XX(1)	XX(2)	XX(3)	XX(4)	XX(5)	XX(6)	XX(7)	XX(8)	XX(9)
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
XX(1)	XX(2)	XX(3)	XX(4)	XX(5)	XX(6)	XX(7)	XX(8)	XX(9)
0	0	1	0	0	0	1	0	0

LAST ACCESS	ACCESS NO.	CYCLE NO.	C.O.P. SET	OT. IN HIST.	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	MEMORY USED
THIS ACCESS	3	1	2	2	0	0	0	0	704
THIS ACCESS	4	1	3	3	0	0	0	0	704

LAST ACCESS	CYCLE TIME	TIME IN CYCL	PRAC IN CYCL	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
THIS ACCESS	0.0	1.000000 01	0.0	0.0	0.0	0.0	0.0	0.0
THIS ACCESS	0.0	1.000000 01	0.0	0.0	0.0	0.0	0.0	0.0

ROD AND FOLLOWER CONCENTRATIONS BEING ZEROED FOR NRZ SET 1

ROD AND FOLLOWER CONCENTRATIONS BEING ZEROED FOR NRZ SET 2

ROD AND FOLLOWER CONCENTRATIONS BEING ZEROED FOR NRZ SET 3

ROD CONCENTRATIONS INSERTED IN ALL ZONES THROUGH 5 AND FOLLOWER CONCENTRATIONS INSERTED IN REMAINING ZONES FOR NRZ SET 1

ROD CONCENTRATIONS INSERTED IN ALL ZONES THROUGH 14 AND FOLLOWER CONCENTRATIONS INSERTED IN REMAINING ZONES FOR NRZ SET 2

ROD CONCENTRATIONS INSERTED IN ALL ZONES THROUGH 27 AND FOLLOWER CONCENTRATIONS INSERTED IN REMAINING ZONES FOR NRZ SET 3

NUCLEAR DENSITIES IN ROD-FOLLOWER ZONES

ZONE	IN NRZ SET	ENTRY	FOLLOWER
ZONE 2	1.000000 00	ENTRY 1	FOLLOWER 0.0
ZONE 3	1.000000 00	ENTRY 2	FOLLOWER 0.0
ZONE 4	1.000000 00	ENTRY 3	FOLLOWER 0.0
ZONE 5	1.000000 00	ENTRY 4	FOLLOWER 0.0
ZONE 6	0.0	ENTRY 5	FOLLOWER 1.000000 01
ZONE 7	0.0	ENTRY 6	FOLLOWER 1.000000 01
ZONE 8	0.0	ENTRY 7	FOLLOWER 1.000000 01

STANDARD OF WORK - A 100% COMPLIANCE WITH ALL APPLICABLE LAWS - 21.1.1.1

DATA HAS BEEN RECEIVED SUCCESSFULLY FROM INTERFAC FILE	CONTROL	REQUEST NUMBER	AND SERIAL	VERSION (1)
STATIONING RECORDS ON FILE CONTROL HAVE BEEN RECEIVED	STATIONING	400145		
STATIONING RECORDS ON FILE CONTROL HAVE BEEN RECEIVED	STATIONING	400145		

THE UNIVERSITY OF CHICAGO

[illegible][illegible]

WILLIAM HENRY HARRIS IN 1900-1901

[illegible]

ZOMF 10	14	MR2	SET	1	ENTRY	0	
MODS1	0.0				POLL1	1.000000	01
ZOMF 12	14	MR2	SET	2	ENTRY	11	
MODS2	0.0				POLL2	2.000000	01
ZOMF 13	14	MR2	SET	2	ENTRY	12	
MODS2	0.0				POLL2	2.000000	01
ZOMF 14	14	MR2	SET	2	ENTRY	13	
MODS2	2.000000	00			POLL3	0.0	
ZOMF 15	14	MR2	SET	2	ENTRY	14	
MODS2	2.000000	00			POLL2	0.0	
ZOMF 16	14	MR2	SET	2	ENTRY	15	
MODS2	2.000000	00			POLL2	0.0	
ZOMF 17	14	MR2	SET	2	ENTRY	16	
MODS2	2.000000	00			POLL2	0.0	
ZOMF 18	14	MR2	SET	2	ENTRY	17	
MODS2	2.000000	00			POLL2	0.0	
ZOMF 19	14	MR2	SET	2	ENTRY	18	
MODS2	0.0				POLL2	2.000000	01
ZOMF 20	14	MR2	SET	2	ENTRY	19	
MODS2	0.0				POLL2	2.000000	01
ZOMF 22	14	MR2	SET	3	ENTRY	21	
MODS3	0.0				POLL3	1.000000	01
ZOMF 23	14	MR2	SET	3	ENTRY	22	
MODS3	0.0				POLL3	1.000000	01
ZOMF 24	14	MR2	SET	3	ENTRY	23	
MODS3	2.000000	00			POLL3	0.0	
ZOMF 25	14	MR2	SET	3	ENTRY	24	
MODS3	1.000000	00			POLL3	0.0	
ZOMF 26	14	MR2	SET	3	ENTRY	25	
MODS3	1.000000	00			POLL3	0.0	
ZOMF 27	14	MR2	SET	3	ENTRY	26	
MODS3	1.000000	00			POLL3	0.0	
ZOMF 28	14	MR2	SET	3	ENTRY	27	
MODS3	1.000000	00			POLL3	0.0	
ZOMF 29	14	MR2	SET	3	ENTRY	28	
MODS3	1.000000	00			POLL3	0.0	
ZOMF 30	14	MR2	SET	3	ENTRY	29	
MODS3	1.000000	00			POLL3	0.0	
ZOMF 31	14	MR2	SET	3	ENTRY	30	
MODS3	0.0				POLL3	1.000000	01
ZOMF 32	14	MR2	SET	3	ENTRY	31	
MODS3	2.000000	00			POLL3	2.000000	01
ZOMF 33	14	MR2	SET	3	ENTRY	32	
MODS3	1.000000	00			POLL3	1.000000	01
ZOMF 34	14	MR2	SET	3	ENTRY	33	
MODS3	1.000000	00			POLL3	1.000000	01
ZOMF 35	14	MR2	SET	3	ENTRY	34	
MODS3	1.000000	00			POLL3	1.000000	01
ZOMF 36	14	MR2	SET	3	ENTRY	35	
MODS3	1.000000	00			POLL3	1.000000	01
ZOMF 37	14	MR2	SET	3	ENTRY	36	
MODS3	1.000000	00			POLL3	1.000000	01
ZOMF 38	14	MR2	SET	3	ENTRY	37	
MODS3	1.000000	00			POLL3	1.000000	01
ZOMF 39	14	MR2	SET	3	ENTRY	38	
MODS3	1.000000	00			POLL3	1.000000	01
ZOMF 40	14	MR2	SET	3	ENTRY	39	
MODS3	1.000000	00			POLL3	1.000000	01
ZOMF 41	14	MR2	SET	3	ENTRY	40	
MODS3	1.000000	00			POLL3	1.000000	01
ZOMF 42	14	MR2	SET	3	ENTRY	41	
MODS3	1.000000	00			POLL3	1.000000	01
ZOMF 43	14	MR2	SET	3	ENTRY	42	
MODS3	1.000000	00			POLL3	1.000000	01
ZOMF 44	14	MR2	SET	3	ENTRY	43	
MODS3	1.000000	00			POLL3	1.000000	01
ZOMF 45	14	MR2	SET	3	ENTRY	44	
MODS3	1.000000	00			POLL3	1.000000	01
ZOMF 46	14	MR2	SET	3	ENTRY	45	
MODS3	1.000000	00			POLL3	1.000000	01
ZOMF 47	14	MR2	SET	3	ENTRY	46	
MODS3	1.000000	00			POLL3	1.000000	01
ZOMF 48	14	MR2	SET	3	ENTRY	47	
MODS3	1.000000	00			POLL3	1.000000	01
ZOMF 49	14	MR2	SET	3	ENTRY	48	
MODS3	1.000000	00			POLL3	1.000000	01
ZOMF 50	14	MR2	SET	3	ENTRY	49	
MODS3	1.000000	00			POLL3	1.000000	01

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INPUT SECTION 13
MAY 30

MEMORY REQUIRED 3044

TITLE FROM CROSS SECTION FILE / LARGE CODE X-SECTIONS

MAXIMUM 30 FOR SEV 1
MAY 10 MAY 11 MAY 12 MAY 13 MAY 14 MAY 15 MAY 16 MAY 20 MAY 24 MAY 26 MAY 28 MAY 30
MAY 40 MAY 48 MAY 112 MAY 135 MAY 136 MAY 138 MAY 140 MAY 141 MAY 142 MAY 176 MAY 224 MAY 238
MAY 236 MAY 240 MAY 242 MAY 336 MAY 338 MAY 352

INPUT SECTION 20

NOPE 10 NCYS 0 11 15 0.0

1	1	MAY 10	7.400000E-04	MAY 140	2.800000E-04	MAY 141	1.400000E-04	MAY 142	8.000000E-05
		MAY 11	7.400000E-03	MAY 135	1.400000E-04	MAY 10	2.800000E-03	MAY 11	6.250000E-03
		MAY 12	5.250000E-03	MAY 13	2.500000E-04	MAY 14	8.070000E-13	MAY 16	1.800000E-02
		MAY 14	2.400000E-04		0.0		0.0		0.0
2	2	MAY 236	1.010000E-33	MAY 240	4.000000E-04	MAY 141	1.400000E-04	MAY 242	1.120000E-04
		MAY 238	7.200000E-03	MAY 135	1.700000E-03	MAY 10	2.900000E-03	MAY 11	6.250000E-03
		MAY 12	4.250000E-03	MAY 13	2.500000E-04	MAY 20	8.070000E-03	MAY 16	1.800000E-02
		MAY 14	2.400000E-04		0.0		0.0		0.0
3	3	MAY 336	1.401070E-02	MAY 338	4.200000E-02	MAY 13	1.730000E-03	MAY 44	4.010000E-03
		MAY 12	3.840000E-03	MAY 13	1.900000E-04	MAY 44	8.000000E-03	MAY 16	2.802000E-02
			0.0		0.0		0.0		0.0
4	4	MAY 10	1.410000E-02	MAY 48	3.537000E-02	MAY 12	3.360000E-02	MAY 13	1.470000E-03
			0.0		0.0		0.0		0.0
5	5	MAY 14	0.0		0.0		0.0		0.0
6	6	MAY 10	0.0		0.0		0.0		0.0
7	7	MAY 176	0.0	MAY 352	4.250000E-13	MAY 112	0.0	MAY 224	1.432000E-02
		MAY 40	0.0	MAY 40	0.0	MAY 40	0.0		0.0
8	8	MAY 176	1.700000E-03	MAY 352	4.600000E-03	MAY 112	3.432500E-03	MAY 224	1.374000E-02
		MAY 40	1.010000E-03	MAY 40	2.800000E-03	MAY 40	1.100000E-03		0.0
9	9	MAY 176	3.130000E-03	MAY 352	3.130000E-03	MAY 112	7.200000E-03	MAY 224	9.150000E-03
		MAY 40	1.020000E-03	MAY 40	1.730000E-03	MAY 40	2.000000E-03		0.0
10	10	MAY 176	4.800000E-03	MAY 352	1.700000E-03	MAY 112	1.000000E-03	MAY 224	6.570000E-03
		MAY 40	4.700000E-03	MAY 40	4.000000E-03	MAY 40	3.400000E-03		0.0
11	11	MAY 10	2.400000E-03	MAY 176	0.0	MAY 352	4.250000E-03	MAY 12	4.250000E-03
		MAY 13	2.500000E-04	MAY 112	0.0	MAY 224	1.432000E-02	MAY 40	0.0
		MAY 40	0.0	MAY 40	0.0		0.0		0.0

CONFIDENTIAL - SECURITY INFORMATION 24 (2-1) DOMESTIC AND FOREIGN INFORMATION

DATA WAS OBTAINED SUCCESSFULLY FROM INTERFACE FILE. COUNT: 60057. LOST: 2 AND 6. (1ST INVERSION 1)

THE INITIAL IDENTITY FILE NUMBER WAS OPEN CLEARED ON JAN 1967 17

CONTENTS OF THIS CONTAINER
SHOULD BE OPENED BY THE USER
AT THE USER'S OWN RISK

[illegible]

RECEIVED: 12/10/57. DATA: 12/10/57. ANALYSIS: 12/10/57. NO. OF DISSEMINATIONS: 17

LAST ACCESS	ACCESS NO.	COUNT	PRIM	WAST	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	MONDAY USED
1	1	1	1	1	0	0	0	0
2	1	1	1	1	0	0	0	0
3	1	1	1	1	0	0	0	0
4	1	1	1	1	0	0	0	0
5	1	1	1	1	0	0	0	0
6	1	1	1	1	0	0	0	0
7	1	1	1	1	0	0	0	0
8	1	1	1	1	0	0	0	0
9	1	1	1	1	0	0	0	0
10	1	1	1	1	0	0	0	0
11	1	1	1	1	0	0	0	0
12	1	1	1	1	0	0	0	0
13	1	1	1	1	0	0	0	0
14	1	1	1	1	0	0	0	0
15	1	1	1	1	0	0	0	0
16	1	1	1	1	0	0	0	0
17	1	1	1	1	0	0	0	0
18	1	1	1	1	0	0	0	0
19	1	1	1	1	0	0	0	0
20	1	1	1	1	0	0	0	0
21	1	1	1	1	0	0	0	0
22	1	1	1	1	0	0	0	0
23	1	1	1	1	0	0	0	0
24	1	1	1	1	0	0	0	0
25	1	1	1	1	0	0	0	0
26	1	1	1	1	0	0	0	0
27	1	1	1	1	0	0	0	0
28	1	1	1	1	0	0	0	0
29	1	1	1	1	0	0	0	0
30	1	1	1	1	0	0	0	0
31	1	1	1	1	0	0	0	0
32	1	1	1	1	0	0	0	0
33	1	1	1	1	0	0	0	0
34	1	1	1	1	0	0	0	0
35	1	1	1	1	0	0	0	0
36	1	1	1	1	0	0	0	0
37	1	1	1	1	0	0	0	0
38	1	1	1	1	0	0	0	0
39	1	1	1	1	0	0	0	0
40	1	1	1	1	0	0	0	0
41	1	1	1	1	0	0	0	0
42	1	1	1	1	0	0	0	0
43	1	1	1	1	0	0	0	0
44	1	1	1	1	0	0	0	0
45	1	1	1	1	0	0	0	0
46	1	1	1	1	0	0	0	0
47	1	1	1	1	0	0	0	0
48	1	1	1	1	0	0	0	0
49	1	1	1	1	0	0	0	0
50	1	1	1	1	0	0	0	0
51	1	1	1	1	0	0	0	0
52	1	1	1	1	0	0	0	0
53	1	1	1	1	0	0	0	0
54	1	1	1	1	0	0	0	0
55	1	1	1	1	0	0	0	0
56	1	1	1	1	0	0	0	0
57	1	1	1					

[illegible]

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ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED
DATE 08-11-2010 BY 60322 UCBAW

135 700 000 GROSS INVESTED IN MINING AND CONCENTRATION OF HIGHLY TAXED 11% IN ZONES 2 AND 3 OF THE

• 2022 040704-006 41 20110000 20110000

[illegible][illegible][illegible][illegible][illegible]

RUN TITLE - ROOMOD SAMPLE PROBLEM 2. 2-D ROD POSITIONING AND FRACTIONAL INSERTION.

REFERENCE REAL TIME FROM ZNATON INTERFACE FILE = 0.0 DAYS

SOLUTION BY FINITE-DIFFERENCE DIFFUSION THEORY
EIGENVALUE PROBLEM
GEOMETRY NO. 9 2-D TRIANGULAR
TRIANGULAR OPTION 1 PARALLELOGRAM - 60 DEGREE
NUMBER OF ENERGY GROUPS 4
NUMBER OF UPSCATTER GROUPS (MAX) 0
NUMBER OF DOWNSCATTER GROUPS (MAX) 4
NUMBER OF INTERVALS IN DIMENSION 1 (COLUMNS) 50
NUMBER OF INTERVALS IN DIMENSION 2 (ROWS) 25
NUMBER OF INTERVALS IN DIMENSION 3 (PLANES) 1
NUMBER OF ZONES 14
NUMBER OF REGIONS 30
NUMBER OF BLACK ABSORBER ZONES 1
BOUNDARY INDICATORS- LEFT 1 RIGHT 2
TOP 1 BOTTOM 2

MEMORY REQUIREMENTS FOR DATA STORAGE

	TOTAL		A	H	C	D
	MINIMUM	MAXIMUM				
STORAGE AVAILABLE	46300					
MACHIN CALCULATION	1718					
EQUATION CONSTANTS CALCULATION						
CORE CONTAINED OR SPACE STORED	7330	7330				
PLANE STORED	9830	9830				
ROW STORED	2294	2294				
MULTI-LEVEL PLANE STORED	11094	11094				
INITIAL FLUX						
CORE CONTAINED OR SPACE STORED	4271	4271				
OTHER MODES	4271	4271				
ITERATIVE PROCESS						
CORE CONTAINED	45414	37802	1019	618	5071	
SPACE STORED	17221	19074	1019	226	0	
1 PLANE STORED	22221	20076	1019	221	0	
1 PLANE STORED	22221	20076	1019	221	0	
24 ROWS STORED	16244	14100	1019	221	0	
1 ROW STORED	2144	0	1019	226	0	
1 MULTI-LEVEL PLANE STORED	28444	7800	1019	226	18800	
PERTURBATION CALCULATION	7780					

DATA WILL BE STORED FOR ALL GROUPS, ALL SPACE

MEMORY LOCATIONS RESERVED FOR DATA STORAGE--- 46000
MAX MEMORY LOCATIONS REQUIRED FOR THIS PROB--- 45414
MEMORY LOCATIONS NOT USED----- 586

SPECIAL SCRATCH DATASET REQUIREMENTS
MAXIMUM PHYSICAL RECORD IS 7200 WORDS

DATA CONTAINED ARRAYS, CONTROL 36 DATA 730
DIRECT ACCESS FILE 24 REQUIRES 4 RECORDS 2400 WORDS IN LENGTH
DIRECT ACCESS FILE 27 REQUIRES 4 RECORDS 2400 WORDS IN LENGTH

[illegible]

RODSD - CONTROL ROD POSITIONING MODULE - VERSION 1 - JULY 1, 1974 - QUALITY ASSURANCE LEVEL 0

RUN TITLE - RODSD SAMPLE PROBLEM 2, 2-D ROD POSITIONING AND FRACTIONAL INTERPOLATION.

DATA HAS BEEN RETRIEVED SUCCESSFULLY FROM INTERFACE FILES CONTROL RODSD NODRSP ZNATON AND GEOST (VERSION 1)
THE FOLLOWING RECORDS ON FILE CONTROL HAVE BEEN PROCESSED DURING PROINS RODINS

CONTENTS OF RODINS RECORD ON FILE CONTROL

0.0
 0.0
 0.0

LAST ACCESS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
 THIS ACCESS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
 CYCLE NO. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
 TIME IN CYCL 0.0
 THIS ACCESS 0.0

POSITIONING FOR NOZ SET = 1 NUMBER OF ZONES = 4 FIRST ZONE = 12 LAST ZONE = 1 NUMBER OF INTERCHANGES = 1

POSITIONING FOR NOZ SET = 2 NUMBER OF ZONES = 1 FIRST ZONE = 13 LAST ZONE = 13 NUMBER OF INTERCHANGES = 0

POSITIONING FOR NOZ SET = 3 NUMBER OF ZONES = 1 FIRST ZONE = 14 LAST ZONE = 14 NUMBER OF INTERCHANGES = 0

NUCLEON POSITIONS IN ROD-FOLLOWED ZONES

NOZ 12 IN NOZ SET 1 ENTRY 1 MAT 40 3.44400E-03 MAT 11 1.01074E-02 MAT 176 4.00000E-03
 MAT 40 4.23000E-03 MAT 40 4.40200E-03 MAT 34 1.05400E-03
 MAT 224 4.44400E-03 MAT 34 1.05400E-03
 NOZ 10 IN NOZ SET 1 ENTRY 2 MAT 40 2.410000E-03 MAT 112 7.20000E-03 MAT 176 3.01000E-03
 MAT 40 3.42000E-03 MAT 40 4.53000E-03 MAT 34 1.13000E-03
 MAT 224 4.14400E-03 MAT 34 1.13000E-03
 NOZ 9 IN NOZ SET 1 ENTRY 3 MAT 40 2.44400E-03 MAT 11 1.01074E-02 MAT 176 4.00000E-03
 MAT 40 1.41000E-03 MAT 40 1.41000E-03 MAT 34 1.41000E-03
 MAT 224 1.41400E-03 MAT 34 1.41000E-03
 NOZ 8 IN NOZ SET 1 ENTRY 4 MAT 40 2.44400E-03 MAT 112 7.20000E-03 MAT 176 3.01000E-03
 MAT 40 0.0 0.0 MAT 40 0.0 MAT 34 0.0 MAT 34 0.0 MAT 34 0.0
 MAT 224 1.41200E-02 MAT 34 0.0 MAT 34 0.0 MAT 34 0.0
 NOZ 7 IN NOZ SET 1 ENTRY 5 MAT 40 2.44400E-03 MAT 112 7.20000E-03 MAT 176 3.01000E-03
 MAT 40 1.41000E-03 MAT 40 1.41000E-03 MAT 34 1.41000E-03
 MAT 224 1.41400E-03 MAT 34 1.41000E-03
 NOZ 6 IN NOZ SET 2 ENTRY 6 MAT 40 1.41000E-03 MAT 112 7.20000E-03 MAT 176 3.01000E-03
 MAT 40 0.0 0.0 MAT 40 0.0 MAT 34 0.0 MAT 34 0.0 MAT 34 0.0
 MAT 224 1.41200E-02 MAT 34 0.0 MAT 34 0.0 MAT 34 0.0
 NOZ 5 IN NOZ SET 3 ENTRY 7 MAT 40 1.41000E-03 MAT 112 7.20000E-03 MAT 176 3.01000E-03
 MAT 40 0.0 0.0 MAT 40 0.0 MAT 34 0.0 MAT 34 0.0 MAT 34 0.0
 MAT 224 1.41200E-02 MAT 34 0.0 MAT 34 0.0 MAT 34 0.0

MAT224 0.0 MAT342 0.0
 FOR AND FOLLOWED CONCENTRATIONS BEING PREPARED FOR NPZ SET 2
 AND AND FOLLOWED CONCENTRATIONS BEING PREPARED FOR NPZ SET 1
 REACTIONAL AND AND FOLLOWED CONCENTRATIONS INCREASED FOR NPZ SET 2 REACTIONAL AND 0.0000 0.0000
 REACTIONAL AND AND FOLLOWED CONCENTRATIONS INCREASED FOR NPZ SET 1 REACTIONAL AND 0.0000 0.0000
 NUCLEAR REACTIONAL IN AND-FOLLOWED ZONE
 FOR 12 IN NPZ SET 1 ENTRY 1
 MAT 40 0.000000-03 MAT 40 0.000000-03 MAT 112 1.000000-03 MAT 176 0.000000-03
 MAT224 0.000000-03 MAT342 1.000000-03
 FOR 13 IN NPZ SET 1 ENTRY 2
 MAT 40 0.000000-03 MAT 40 0.000000-03 MAT 112 0.000000-03 MAT 176 0.000000-03
 MAT224 0.000000-03 MAT342 0.000000-03
 FOR 14 IN NPZ SET 1 ENTRY 3
 MAT 40 0.000000-03 MAT 40 0.000000-03 MAT 112 0.000000-03 MAT 176 0.000000-03
 MAT224 0.000000-03 MAT342 0.000000-03
 FOR 15 IN NPZ SET 1 ENTRY 4
 MAT 40 0.000000-03 MAT 40 0.000000-03 MAT 112 0.000000-03 MAT 176 0.000000-03
 MAT224 0.000000-03 MAT342 0.000000-03
 FOR 16 IN NPZ SET 1 ENTRY 5
 MAT 40 0.000000-03 MAT 40 0.000000-03 MAT 112 0.000000-03 MAT 176 0.000000-03
 MAT224 0.000000-03 MAT342 0.000000-03
 FOR 17 IN NPZ SET 2 ENTRY 1
 MAT 40 0.000000-03 MAT 40 0.000000-03 MAT 112 0.000000-03 MAT 176 0.000000-03
 MAT224 0.000000-03 MAT342 0.000000-03
 FOR 18 IN NPZ SET 2 ENTRY 2
 MAT 40 0.000000-03 MAT 40 0.000000-03 MAT 112 0.000000-03 MAT 176 0.000000-03
 MAT224 0.000000-03 MAT342 0.000000-03
 FOR 19 IN NPZ SET 2 ENTRY 3
 MAT 40 0.000000-03 MAT 40 0.000000-03 MAT 112 0.000000-03 MAT 176 0.000000-03
 MAT224 0.000000-03 MAT342 0.000000-03
 FOR 20 IN NPZ SET 2 ENTRY 4
 MAT 40 0.000000-03 MAT 40 0.000000-03 MAT 112 0.000000-03 MAT 176 0.000000-03
 MAT224 0.000000-03 MAT342 0.000000-03
 FOR 21 IN NPZ SET 2 ENTRY 5
 MAT 40 0.000000-03 MAT 40 0.000000-03 MAT 112 0.000000-03 MAT 176 0.000000-03
 MAT224 0.000000-03 MAT342 0.000000-03
 TOTAL CPU TIME IS 0.021 MINUTES AND TOTAL CLOCK TIME IS 0.104 MINUTES

ROSCOPD - CONTROL AND POSITIONING MODULE - VERSION 1 - JULY 1, 1978 - QUALITY ASSURANCE LEVEL 0

QUN TYPE - 000000 SAMPLE PROGRAM 2. 2-0 000 POSITIONING AND FRACTIONAL INSERATION.

DATA WAS OPEN RETRIEVED SUCCESSFULLY FROM INTERFAC FILES CONTROL ROOMS I NOXSW 2MAYDN AND GUCST (VERSION 1)

THE FOLLOWING RECORDS ON FILE CONTROL HAVE BEEN PROCESSED DURING PRIOR WORKING

CONTRACTS IN GOOD RECORD OF FILE CONTROL

[illegible][illegible][illegible]

1 NUMBER OF INTERCHANGES = 1

0 = \$25MVA(ILLINOIS) NO CHARGE TO INTERCHANGES =

POSTAL CHARGES FOR 1957 = 3 NUMBERS : 1 FIRST ZONE : 10 LAST ZONE : 14 NUMBER OF CHANGES = 0

WILLIAM C. WILSON, JR.

DATE	IN	NO	BY	DATE	IN	NO	BY
JAN 4	1	20000-03	WAT	5	1	20000-03	WAT
JAN 5	2	10000-03	WAT	6	2	10000-03	WAT
JAN 6	3	10000-03	WAT	7	3	10000-03	WAT
JAN 7	4	10000-03	WAT	8	4	10000-03	WAT
JAN 8	5	10000-03	WAT	9	5	10000-03	WAT
JAN 9	6	10000-03	WAT	10	6	10000-03	WAT
JAN 10	7	10000-03	WAT	11	7	10000-03	WAT
JAN 11	8	10000-03	WAT	12	8	10000-03	WAT
JAN 12	9	10000-03	WAT	13	9	10000-03	WAT
JAN 13	10	10000-03	WAT	14	10	10000-03	WAT
JAN 14	11	10000-03	WAT	15	11	10000-03	WAT
JAN 15	12	10000-03	WAT	16	12	10000-03	WAT
JAN 16	13	10000-03	WAT	17	13	10000-03	WAT
JAN 17	14	10000-03	WAT	18	14	10000-03	WAT
JAN 18	15	10000-03	WAT	19	15	10000-03	WAT
JAN 19	16	10000-03	WAT	20	16	10000-03	WAT
JAN 20	17	10000-03	WAT	21	17	10000-03	WAT
JAN 21	18	10000-03	WAT	22	18	10000-03	WAT
JAN 22	19	10000-03	WAT	23	19	10000-03	WAT
JAN 23	20	10000-03	WAT	24	20	10000-03	WAT
JAN 24	21	10000-03	WAT	25	21	10000-03	WAT
JAN 25	22	10000-03	WAT	26	22	10000-03	WAT
JAN 26	23	10000-03	WAT	27	23	10000-03	WAT
JAN 27	24	10000-03	WAT	28	24	10000-03	WAT
JAN 28	25	10000-03	WAT	29	25	10000-03	WAT
JAN 29	26	10000-03	WAT	30	26	10000-03	WAT
JAN 30	27	10000-03	WAT	31	27	10000-03	WAT
JAN 31	28	10000-03	WAT				

[illegible][illegible][illegible][illegible][illegible][illegible]

MAY224 4.07000E-03 MAY352 1.46000E-03
 SON AND FOLLOWER CONCENTRATIONS BEING PRINTED FOR NO2 SET 2
 SON AND FOLLOWER CONCENTRATIONS BEING PRINTED FOR NO2 SET 3
 PROVISIONAL SON AND FOLLOWER CONCENTRATIONS INJECTED FOR NO2 SET 2 FRACTIONS ARE 0.4000 0.7500
 PROVISIONAL SON AND FOLLOWER CONCENTRATIONS INJECTED FOR NO2 SET 3 FRACTIONS ARE 0.4000 0.4000
 NUCLEON DENSITIES IN SON-FOLLOWER ZONES
 ZONE 12 IN NO2 SET 1 ENTRY 1
 MAY 40 3.07000E-03 MAY 40 2.00000E-03 MAY 40 7.00000E-03 MAY 40 1.10000E-03
 MAY224 5.07000E-03 MAY352 3.13000E-03
 ZONE 10 IN NO2 SET 1 ENTRY 2
 MAY 40 1.00000E-03 MAY 40 2.00000E-03 MAY 40 3.00000E-03 MAY 40 4.00000E-03
 MAY224 1.07000E-03 MAY352 2.00000E-03
 ZONE 8 IN NO2 SET 1 ENTRY 3
 MAY 40 0.00000E-03 MAY 40 0.00000E-03 MAY 40 0.00000E-03 MAY 40 0.00000E-03
 MAY224 1.07000E-03 MAY352 2.00000E-03
 ZONE 6 IN NO2 SET 1 ENTRY 4
 MAY 40 0.00000E-03 MAY 40 0.00000E-03 MAY 40 0.00000E-03 MAY 40 0.00000E-03
 MAY224 1.07000E-03 MAY352 2.00000E-03
 ZONE 4 IN NO2 SET 1 ENTRY 5
 MAY 40 0.00000E-03 MAY 40 0.00000E-03 MAY 40 0.00000E-03 MAY 40 0.00000E-03
 MAY224 1.07000E-03 MAY352 2.00000E-03
 ZONE 2 IN NO2 SET 2 ENTRY 6
 MAY 40 1.00000E-03 MAY 40 2.00000E-03 MAY 40 3.00000E-03 MAY 40 4.00000E-03
 MAY224 1.07000E-03 MAY352 2.00000E-03
 ZONE 18 IN NO2 SET 3 ENTRY 7
 MAY 40 1.00000E-03 MAY 40 2.00000E-03 MAY 40 3.00000E-03 MAY 40 4.00000E-03
 MAY224 1.07000E-03 MAY352 2.00000E-03
 ZONE 16 IN NO2 SET 3 ENTRY 8
 MAY 40 1.00000E-03 MAY 40 2.00000E-03 MAY 40 3.00000E-03 MAY 40 4.00000E-03
 MAY224 1.07000E-03 MAY352 2.00000E-03
 TOTAL CONCENTRATIONS IN SON-FOLLOWER ZONES

RECORD - CONTAINS 10,000 RECORDS - JULY 1, 1974 - QUALITY ASSURANCE LEVEL 6

biochemical and molecular biology and practical experience

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[illegible][illegible][illegible]

WULFIE RESPONSIVE IN ONE-TO-ONE 70498

[illegible][illegible]

2046 0 IN 002 907 1 04485 J

44-38861-103

[illegible]

DATE	TIME	LOCATION	WIND	SEA	TEMP	WAVE	WAVE	WAVE
MAY 60	200							
MAY 60	201							
MAY 60	202							
MAY 60	203							
MAY 60	204							
MAY 60	205							
MAY 60	206							
MAY 60	207							
MAY 60	208							
MAY 60	209							
MAY 60	210							
MAY 60	211							
MAY 60	212							
MAY 60	213							
MAY 60	214							
MAY 60	215							
MAY 60	216							
MAY 60	217							
MAY 60	218							
MAY 60	219							
MAY 60	220							
MAY 60	221							
MAY 60	222							
MAY 60	223							
MAY 60	224							
MAY 60	225							
MAY 60	226							
MAY 60	227							
MAY 60	228							
MAY 60	229							
MAY 60	230							
MAY 60	231							
MAY 60	232							
MAY 60	233							
MAY 60	234							
MAY 60	235							
MAY 60	236							
MAY 60	237							
MAY 60	238							
MAY 60	239							
MAY 60	240							
MAY 60	241							
MAY 60	242							
MAY 60	243							
MAY 60	244							
MAY 60	245							
MAY 60	246							
MAY 60	247							
MAY 60	248							
MAY 60	249							
MAY 60	250							
MAY 60	251							
MAY 60	252							
MAY 60	253							
MAY 60	254							
MAY 60	255							
MAY 60	256							
MAY 60	257							
MAY 60	258							
MAY 60	259							
MAY 60	260							
MAY 60	261							
MAY 60	262							
MAY 60	263							
MAY 60	264							
MAY 60	265							

NAME	CI	DOB	AGE	SEX	REL	STATUS	REMARKS
1. [Name]	13	1947	2	Male	1	1	
2. [Name]	14	1948	2	Male	1	1	
3. [Name]	15	1949	2	Male	1	1	
4. [Name]	16	1950	2	Male	1	1	
5. [Name]	17	1951	2	Male	1	1	
6. [Name]	18	1952	2	Male	1	1	
7. [Name]	19	1953	2	Male	1	1	
8. [Name]	20	1954	2	Male	1	1	
9. [Name]	21	1955	2	Male	1	1	
10. [Name]	22	1956	2	Male	1	1	
11. [Name]	23	1957	2	Male	1	1	
12. [Name]	24	1958	2	Male	1	1	
13. [Name]	25	1959	2	Male	1	1	
14. [Name]	26	1960	2	Male	1	1	
15. [Name]	27	1961	2	Male	1	1	
16. [Name]	28	1962	2	Male	1	1	
17. [Name]	29	1963	2	Male	1	1	
18. [Name]	30	1964	2	Male	1	1	
19. [Name]	31	1965	2	Male	1	1	
20. [Name]	32	1966	2	Male	1	1	
21. [Name]	33	1967	2	Male	1	1	
22. [Name]	34	1968	2	Male	1	1	
23. [Name]	35	1969	2	Male	1	1	
24. [Name]	36	1970	2	Male	1	1	
25. [Name]	37	1971	2	Male	1	1	
26. [Name]	38	1972	2	Male	1	1	
27. [Name]	39	1973	2	Male	1	1	
28. [Name]	40	1974	2	Male	1	1	
29. [Name]	41	1975	2	Male	1	1	
30. [Name]	42	1976	2	Male	1	1	
31. [Name]	43	1977	2	Male	1	1	
32. [Name]	44	1978	2	Male	1	1	
33. [Name]	45	1979	2	Male	1	1	
34. [Name]	46	1980	2	Male	1	1	
35. [Name]	47	1981	2	Male	1	1	
36. [Name]	48	1982	2	Male	1	1	
37. [Name]	49	1983	2	Male	1	1	
38. [Name]	50	1984	2	Male	1	1	
39. [Name]	51	1985	2	Male	1	1	
40. [Name]	52	1986	2	Male	1	1	
41. [Name]	53	1987	2	Male	1	1	
42. [Name]	54	1988	2	Male	1	1	
43. [Name]	55	1989	2	Male	1	1	
44. [Name]	56	1990	2	Male	1	1	
45. [Name]	57	1991	2	Male	1	1	
46. [Name]	58	1992	2	Male	1	1	
47. [Name]	59	1993	2	Male	1	1	
48. [Name]	60	1994	2	Male	1	1	
49. [Name]	61	1995	2	Male	1	1	
50. [Name]	62	1996	2	Male	1	1	
51. [Name]	63	1997	2	Male	1	1	
52. [Name]	64	1998	2	Male	1	1	
53. [Name]	65	1999	2	Male	1	1	
54. [Name]	66	2000	2	Male	1	1	
55. [Name]	67	2001	2	Male	1	1	
56. [Name]	68	2002	2	Male	1	1	
57. [Name]	69	2003	2	Male	1	1	
58. [Name]	70	2004	2	Male	1	1	
59. [Name]	71						

[illegible]

.....

MAT224 0.15000E-03 MAT352 3.13000E-03
 END AND FOLLOWER CONCENTRATIONS BEING PERIOD FOR W/2 SET 2
 END AND FOLLOWER CONCENTRATIONS BEING PERIOD FOR W/2 SET 3
 PRAXIONAL END AND FOLLOWER CONCENTRATIONS INSERTED FOR W/2 SET 2 FRACTIONS ARE 0.0 1.0000
 PRAXIONAL END AND FOLLOWER CONCENTRATIONS INSERTED FOR W/2 SET 3 FRACTIONS ARE 0.2500 0.7500
 NUCLEIDE DENSITIES IN ROD-FOLLOWER ZONES
 ZONE 12 IN W/2 SET 1 ENTRY 1
 MAT 40 1.01000E-03 MAT 50 2.84750E-03
 MAT224 1.37400E-02 MAT352 4.69500E-03
 ZONE 10 IN W/2 SET 1 ENTRY 2
 MAT 40 0.0 MAT 50 3.0
 MAT224 1.83200E-02 MAT352 4.24000E-03
 ZONE 8 IN W/2 SET 1 ENTRY 3
 MAT 40 0.0 MAT 50 0.0
 MAT224 1.83200E-02 MAT352 4.24000E-03
 ZONE 6 IN W/2 SET 1 ENTRY 4
 MAT 40 0.0 MAT 50 3.0
 MAT224 1.83200E-02 MAT352 4.24000E-03
 ZONE 4 IN W/2 SET 1 ENTRY 5
 MAT 40 0.0 MAT 50 0.0
 MAT224 1.83200E-02 MAT352 4.24000E-03
 ZONE 2 IN W/2 SET 1 ENTRY 6
 MAT 40 0.0 MAT 50 3.0
 MAT224 1.83200E-02 MAT352 4.24000E-03
 ZONE 14 IN W/2 SET 3 ENTRY 9
 MAT 40 1.01000E-03 MAT 50 2.84750E-03
 MAT224 1.37400E-02 MAT352 4.69500E-03
 TOTAL CPU TIME IS 0.020 MINUTES AND TOTAL CLOCK TIME IS 3.0224 MINUTES

[illegible][illegible]

RECEIVED THE OFFICE OF THE ATTORNEY GENERAL

[illegible][illegible]

	ACCESS NO.	CYCLE NO.	C.D.O. NO.	PT. IN MS.	XXXXXXXXXX	XXXXXXXXXX	MEMORY USED
1	4	1	4	4	0	0	1647
2	4	2	4	4	0	0	1647
3	4	3	4	4	0	0	1647
4	4	4	4	4	0	0	1647

[illegible]

DETERMINING THE VOTING PATTERN OF THE 1970S

0 = SECONDARY TO PRIMARY IF NUMBER OF INTERCHANGES

[illegible]

WALLING NEWSPAPERS IN OP-POLLING ZONES

CO-4600-201 35EATM 2C-200E01 20-00-00
01-00-00 01-00-00 01-00-00 01-00-00
1-00-00 1-00-00 1-00-00 1-00-00

CO-00002 25 APR 20-000001 02 APR
O'C OF APR 20 0 APR
2 APR 1 00 0001 0 00

[illegible][illegible]

TIME - IN 402 SPY 1 PM18V 5
MAY 27 0.0 MAY 30 C.0
MAY 28 1.032000-32 MAY 32 1.260000-03

26-78	25-0000-32	2 MAY 68	2 MAY 68
MAY 40	C.C.	MAY 68	C.C.
JUNE 13	IN NOZ 987	AUG 68	

2000 14 14 02 587 3 21474 2
14 00 1-01000-03 MAY 20 2-04702-03

MAT224 1.370007-02 MAT352 0.000007-03
 END AND FOLLOWER CONCENTRATIONS W/ING ZEROED FOR NO2 SEV 2
 NOC AND FOLLOWER CONCENTRATIONS W/ING ZEROED FOR NO2 SEV 3
 REACTIONAL AND AND FOLLOWER CONCENTRATIONS INSERPED FOR NO2 SEV 2 REACTIONS ARE 0.0 1.0000
 REACTIONAL AND AND FOLLOWER CONCENTRATIONS INSERPED FOR NO2 SEV 3 REACTIONS ARE 0.0 1.0000
 NUCLEON OPERATIONS IN 000-FOLLOWER PUMPS
 PUMP 12 IN NO2 SEV 1 ENTRY 1
 MAY 40 0.0 MAY 50 0.0 MAT 60 0.0 MAT 176 0.0
 MAT224 1.032007-02 MAT352 0.240007-03
 PUMP 10 IN NO2 SEV 1 ENTRY 2
 MAY 40 0.0 MAY 50 0.0 MAY 60 0.0 MAT 176 0.0
 MAT224 1.032007-02 MAT352 0.240007-03
 PUMP 9 IN NO2 SEV 1 ENTRY 3
 MAY 40 0.0 MAY 50 0.0 MAY 60 0.0 MAT 176 0.0
 MAT224 1.032007-02 MAT352 0.240007-03
 PUMP 8 IN NO2 SEV 1 ENTRY 4
 MAY 40 0.0 MAY 50 0.0 MAY 60 0.0 MAT 176 0.0
 MAT224 1.032007-02 MAT352 0.240007-03
 PUMP 7 IN NO2 SEV 1 ENTRY 5
 MAY 40 0.0 MAY 50 0.0 MAY 60 0.0 MAT 176 0.0
 MAT224 1.032007-02 MAT352 0.240007-03
 PUMP 13 IN NO2 SEV 2 ENTRY 1
 MAY 40 0.0 MAY 50 0.0 MAY 60 0.0 MAT 176 0.0
 MAT224 1.032007-02 MAT352 0.240007-03
 PUMP 14 IN NO2 SEV 3 ENTRY 1
 MAY 40 0.0 MAY 50 0.0 MAY 60 0.0 MAT 176 0.0
 MAT224 1.032007-02 MAT352 0.240007-03
 TOTAL CPU TIME IS 0.010 MINUTES AND TOTAL CLOCK TIME IS 3.201 MINUTES

MOD - CONTROL ROD POSITIONING MODULE - VERSION 1 - JULY 1, 1978 - QUALITY ASSURANCE LEVEL 0

RUN TITLE - RODS09 SAMPLE PROBLEM 2, 2-D ROD POSITIONING AND FRACTIONAL INSERTION.

DATA HAS BEEN RETRIEVED SUCCESSFULLY FROM INTERFACE FILES CONTROL RODSET NOXSRF ZNATON AND GEOSTY (VERSION 1)

DATA HAS BEEN RETRIEVED SUCCESSFULLY FROM INTERFACE FILES ZNATON

THE FOLLOWING RECORDS ON FILE CONTROL HAVE BEEN PROCESSED OVENS PROINS RODINS

CONTENTS OF RODINS RECORD OF FILE CONTROL

XX(1)	XX(2)	XX(3)	XX(4)	XX(5)	XX(6)	XX(7)	XX(8)	XX(9)
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

IX(1)	IX(2)	IX(3)	IX(4)	IX(5)	IX(6)	IX(7)	IX(8)	IX(9)	IX(10)	IX(11)	IX(12)	IX(13)	IX(14)	IX(15)	IX(16)
0	0	1	0	0	0	0	1	0	-3	0	0	1	0	0	0

LAST ACCESS	ACCESS NO.	CYCLE NO.	C.R.P. SET	PT. IN HIST.	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
THIS ACCESS	6	1	6	6	0	0	0	0	1247
	7	1	-3	0	0	0	0	0	1837

LAST ACCE	CYCLE TIME	TIME IN CYCL	PRAC IN CYCL	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
THIS ACCESS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

PROCESSING DENSITIES FROM ZNATON FILE - UNIT 10

POSITIONING FOR NOZ SET = 1 NUMBER OF ZONES = 4 FIRST ZONE = 12 LAST ZONE = 7

POSITIONING FOR NOZ SET = 2 NUMBER OF ZONES = 1 FIRST ZONE = 13 LAST ZONE = 13

POSITIONING FOR NOZ SET = 3 NUMBER OF ZONES = 1 FIRST ZONE = 14 LAST ZONE = 14

NEW ESTIMATING DENSITIES IN SHUT-DOWN ZONES

MULTIPLE DENSITIES IN ROD-FOLLOWER ZONES

ZONE	IN NOZ SET	ENTRY	NOZ	NOZ SET	ENTRY	NOZ	NOZ SET	ENTRY	NOZ	NOZ SET	ENTRY	NOZ	NOZ SET	ENTRY
12	1	1	12	1	1	12	1	1	12	1	1	12	1	1
13	2	2	13	2	2	13	2	2	13	2	2	13	2	2
14	3	3	14	3	3	14	3	3	14	3	3	14	3	3
15	4	4	15	4	4	15	4	4	15	4	4	15	4	4
16	5	5	16	5	5	16	5	5	16	5	5	16	5	5

[illegible][illegible]

RECEIVED 12 JUL 1964

100-443891-3

[illegible]

• Paul A. Jones African

NAME	AGE	SEX	REL	DATE	TIME	LOCATION	REMARKS
John Doe	35	M	H	1950	12:30	Room 101	Admitted
Jane Doe	32	F	W	1950	12:30	Room 101	Admitted
Bob Smith	40	M	H	1950	12:30	Room 101	Admitted
Alice Smith	38	F	W	1950	12:30	Room 101	Admitted
Charlie Brown	25	M	H	1950	12:30	Room 101	Admitted
Patricia Brown	22	F	W	1950	12:30	Room 101	Admitted
Frank White	50	M	H	1950	12:30	Room 101	Admitted
Grace White	48	F	W	1950	12:30	Room 101	Admitted
Henry Black	60	M	H	1950	12:30	Room 101	Admitted
Irene Black	58	F	W	1950	12:30	Room 101	Admitted
Jack Green	70	M	H	1950	12:30	Room 101	Admitted
Karen Green	68	F	W	1950	12:30	Room 101	Admitted
Leo Blue	80	M	H	1950	12:30	Room 101	Admitted
Mary Blue	78	F	W	1950	12:30	Room 101	Admitted
Ned Yellow	90	M	H	1950	12:30	Room 101	Admitted
Olivia Yellow	88	F	W	1950	12:30	Room 101	Admitted
Peter Orange	100	M	H	1950	12:30	Room 101	Admitted
Quinn Orange	98	F	W	1950	12:30	Room 101	Admitted
Sam Purple	110	M	H	1950	12:30	Room 101	Admitted
Tina Purple	108	F	W	1950	12:30	Room 101	Admitted
Ulysses Grey	120	M	H	1950	12:30	Room 101	Admitted
Veronica Grey	118	F	W	1950	12:30	Room 101	Admitted
Walter Silver	130	M	H	1950	12:30	Room 101	Admitted
Xenia Silver	128	F	W	1950	12:30	Room 101	Admitted
Yakov Gold	140	M	H	1950	12:30	Room 101	Admitted
Zoe Gold	138	F	W	1950	12:30	Room 101	Admitted

[illegible]

INPUT SECTION 13
NMS 48

MEMORY REQUIRED 4324

TITLE FROM CROSS SECTION FILE /XSDRPM - GAS COOLED THERMAL REACTOR DATA, 4 GROUP, C/HM 250

NDXS(1) 48 FOR SET 1											
TM-232	PA-233	U-233	U-234	U-235	U-236	NP-239	PU-242	AM-243	U-238	PU-239	PU-240
PU-241	C	1-135	XE-135	PM-147	PM-148	PM-149	PM-149	SM-149	NO-143	FP1	FP2
KE-82	KE-83	RM-103	RM-105	AG-109	XF-131	XF-133	CS-133	CS-134	CS-135	NO-145	EU-153
PU-194	PU-195	NO-147	SM-150	SM-151	SM-152	0	51	RECVEL	HE	ROD3	ROD4

NDXS(1) 48 FOR SET 2											
TM-232	PA-233	U-233	U-234	U-235	U-236	NP-239	U-242	AM-243	U-238	PU-239	PU-240
PU-241	C	1-135	XE-135	PM-147	PM-148	PM-149	PM-149	SM-149	NO-143	FP1	FP2
KE-82	KE-83	RM-103	RM-105	AG-109	XF-131	XF-133	CS-133	CS-134	CS-135	NO-145	EU-153
PU-194	PU-195	NO-147	SM-150	SM-151	SM-152	0	51	RECVFL	HE	ROD1	ROD2

INPUT SECTION 20
NDP 0 NCT5 3 TIMES 0.0

1	1 st							
MF		2.100000E-04	51	3.999999E-04	0	6.400000E-04	RECVFL	4.997999E-05
C		7.999999E-02		0.0		0.0		0.0

1	4							
U-234		1.999999E-04	U-238	1.092599E-04	TM-232	3.199999E-04		0.0

4	10							
U-239		2.399999E-04	U-238	1.197000E-04	TM-232	3.199999E-04		0.0

11	14							
U-237		2.799999E-05	U-234	1.263100E-04	TM-232	3.199999E-04		0.0

14	17							
C		1.900000E-01	MF	1.000000E-05		0.0		0.0

14	18							
C		9.999999E-02	MF	2.499999E-04		0.0		0.0

17	20							
MF		1.993000E-04	C	1.000000E-02	ROD1	2.003000E-04		0.0

23	23							
MF		9.949999E-04	C	4.000000E-02	ROD2	5.003000E-04		0.0

24	24							
C		1.100000E-01	MF	9.999999E-04	RECV-L	9.999999E-04		0.0

INTERFACE FILE NXSOF HAS BEEN WRITTEN ON UNIT 14

INTERFACE FILE NXSOFN HAS BEEN WRITTEN ON UNIT 14

INVENTORY AND REACTION RATES BY ABSOLUTE NUCLEI											
***** START ON STEP TIME ***** END OF STEP TIME ***** 100,000 DAYS *****											
NUCL	NAME	INVENTORY (KG)	ABSORPTION	FISSION	PRODUCTION	CAPTURE (M/G)	INVENTORY (KG)	ABSORPTION	FISSION	PRODUCTION	CAPTURE (M/G)
1	U-235	4.5310E-03	4.4310E-03	0.0	0.0	4.53387E-03	4.5310E-03	4.4310E-03	0.0	0.0	4.49733E-03
2	U-238	3.3323E-04	2.4004E-02	0.0	0.0	2.43197E-02	3.3323E-04	2.4004E-02	0.0	0.0	2.4004E-02
3	MO-99	0.0	0.0	0.0	0.0	0.0	1.2001E-02	1.1649E-02	0.0	0.0	1.2001E-02
4	U-235	0.0	0.0	0.0	0.0	0.0	7.4321E-04	7.4321E-04	0.0	0.0	7.4321E-04
5	U-238	0.0	0.0	0.0	0.0	0.0	3.5600E-06	3.5600E-06	0.0	0.0	3.5600E-06
6	MO-99	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
7	U-235	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
8	U-238	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
9	MO-99	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
10	U-235	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
11	U-238	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
12	MO-99	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
13	U-235	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
14	U-238	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
15	MO-99	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
16	U-235	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
17	U-238	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
18	MO-99	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
19	U-235	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
20	U-238	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
21	MO-99	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
22	U-235	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
23	U-238	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
24	MO-99	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
25	U-235	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
26	U-238	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
27	MO-99	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
28	U-235	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
29	U-238	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
30	MO-99	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
31	U-235	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
32	U-238	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
33	MO-99	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
34	U-235	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
35	U-238	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
36	MO-99	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
37	U-235	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
38	U-238	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
39	MO-99	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
40	U-235	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
41	U-238	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
42	MO-99	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
43	U-235	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
44	U-238	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
45	MO-99	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
46	U-235	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
47	U-238	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
48	MO-99	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
49	U-235	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03
50	U-238	0.0	0.0	0.0	0.0	0.0	1.4709E-03	1.4709E-03	0.0	0.0	1.4709E-03

TOTAL		3.3323E-04	4.4310E-03	1.4709E-03	1.4709E-03	3.3323E-04	3.3323E-04	4.4310E-03	1.4709E-03	1.4709E-03	3.3323E-04
INVENTORY		3.3323E-04	4.4310E-03	1.4709E-03	1.4709E-03	3.3323E-04	3.3323E-04	4.4310E-03	1.4709E-03	1.4709E-03	3.3323E-04
ABSORPTION		2.4004E-02	2.4004E-02	1.4709E-03	1.4709E-03	2.4004E-02	2.4004E-02	2.4004E-02	1.4709E-03	1.4709E-03	2.4004E-02
FISSION		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PRODUCTION		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CAPTURE		2.4004E-02	2.4004E-02	1.4709E-03	1.4709E-03	2.4004E-02	2.4004E-02	2.4004E-02	1.4709E-03	1.4709E-03	2.4004E-02
TOTAL		3.3323E-04	4.4310E-03	1.4709E-03	1.4709E-03	3.3323E-04	3.3323E-04	4.4310E-03	1.4709E-03	1.4709E-03	3.3323E-04
INVENTORY		3.3323E-04	4.4310E-03	1.4709E-03	1.4709E-03	3.3323E-04	3.3323E-04	4.4310E-03	1.4709E-03	1.4709E-03	3.3323E-04
ABSORPTION		2.4004E-02	2.4004E-02	1.4709E-03	1.4709E-03	2.4004E-02	2.4004E-02	2.4004E-02	1.4709E-03	1.4709E-03	2.4004E-02
FISSION		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PRODUCTION		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CAPTURE		2.4004E-02	2.4004E-02	1.4709E-03	1.4709E-03	2.4004E-02	2.4004E-02	2.4004E-02	1.4709E-03	1.4709E-03	2.4004E-02

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NOV 1960
U.S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D.C.

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[illegible][illegible][illegible][illegible][illegible][illegible]

DATE 04/07/2008 BY 24161506 00,7000

06-082807 0200 01-000505000 0000
1 0000 1 000 000 01 0000

00-46866-2 0000 00-46866-2 0000
? 0000 ? 0000

00-68000-1, 00-68000-2
00-68000-3, 00-68000-4

10-201540-9 9552 1 445 600 41 0 0002

100-443887-100

100-443887-100

[illegible]

2500 10 14 407 497 2 84707 0

61 ABAND 8 435 264 N1 02 5002

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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ROOM33 - CONTROL ROOM POSITIONING MODULE - VERSION 1 - JULY 1, 1978 - QUALITY ASSURANCE LEVEL C

Run #174 - MODULO SAMPLE NUMBER 3, MOD POSITIONING AND 2-CYCLE DEPLETION.

DATA WAS RETN OBTAINED SUCCESSFULLY FROM INTERFACE FILES CONTROL ROUTER MOX300 ZNATON AND GEO017 (VERSION 2)

THE FOLLOWING RECORDS ON FILE CONTROL HAVE BEEN PROCESSED DURING DURING DURING

CONTENTS OF ROOMS SECOND OF FILE CONTROL

$x(1)$	$x(2)$	$x(3)$	$x(4)$	$x(5)$	$x(6)$	$x(7)$	$x(8)$	$x(9)$
3.000000 02	3.000000 02	0.0	0.0	0.0	0.0	0.0	0.0	0.0
$y(1)$	$y(2)$	$y(3)$	$y(4)$	$y(5)$	$y(6)$	$y(7)$	$y(8)$	$y(9)$
0	0	0	0	0	0	0	0	0

	ADDRESS NO.	CYCLE NO.	C.O.P. NO.	DT. IN HIST.	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
1457 ADDRESS	3	1	0	3	0	0	0	0	14047 R02
7413 ADDRESS	4	1	0	4	0	0	0	3	3301
									2301
	CYCLE TIME	TIME IN CYCL	SPACE IN CYCL	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
1457 ADDRESS	3.000000 02	2.000000 02	6.666667-01	0.0	0.0	3.0	3.0	0.0	0.0
7413 ADDRESS	3.000000 02	3.000000 02	1.000000-02	0.0	0.0	0.0	0.0	0.0	0.0

2091154145 000 487 887 = 1 NUMBER OF ZONES = 4 FIRST ZONE = 16 LAST ZONE = 10 NUMBER OF INTERCHANGES = 1

*****MAYG KCB V72 SVV = 0 NUMBER OF ZONES = 1 FIRST ZONE = 26 LAST ZONE = 83 NUMBER OF INTERCHANGES = 2

WFO: 104917184 14 000-00110000 10499

3728 16 14 477 987 1 74787 1
3773 1,934,987-25 2224 1,322,137-24

2005 14 407 977 1 74784 2
2003 2.2 2004 2.452124-00

7242 1 14 432 374 1 74104 3
0000 0.1 0000 3.0000000-55

7-10 14 402 309 74454 4
2000 200 2000 2000 2000 2000

1000 1 14 487 307 1 84774 0
2000 1.2 0004 1.477307-35

[illegible]

7-10 24 14 473 000 2 74784 0
0001 2-555557-54 0002 1.5

7000 10 14 202 174 2 7484 2
2001 10 14 202 174 2 7484 2

1-28 25 74 427 374 2 74784 17
7771 7-2 8703 1-422538 54

2-29 21 12 483 904 2 84484 11

***** QUALITY ASSURANCE LEVEL 0 *****

***** QUALITY ASSURANCE LEVEL 0 *****

***** QUALITY ASSURANCE LEVEL 0 *****

***** QUALITY ASSURANCE LEVEL 0 *****

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***** NEUTRONICS MODULE ***** JULY 1, 1974 ***** QUALITY ASSURANCE LEVEL 0 *****

THIS FILE - CONTAINS SAMPLE NUMBER 34 FOR DETERMINING AND 2-CYCLE DETERMINATION.

DIFFERENCE OFAL FILE FROM INITIAL INTERFAC FILE = 3.00000E-02 DAYS

THE FOLLOWING ARE THE DATA 34

THE DATA ARE THE DATA OF THE DATA - GAS FLOWED THROUGH REACTOR DATA, A GROUP, C/HM AND

THE MAXIMUM AND MINIMUM DETERMINATION COEFFICIENTS ARE 0.00000E-01

SEARCH LIMITING FACTORS - SP1 = 1.00000E-02 SP2 = 0.00000E-02 SP3 = 0.00000E-02 SP4 = 0.00000E-02

THE FOLLOWING ARE THE DATA OF THE DATA SUCCESSIVE NEUTRONICS DATA

MAXIMUM SEARCH FACTOR FOR CALCULATING INITIAL PARAMETERS ARE 0.00000E-01

INITIAL DATA FROM PREVIOUS INTERFAC

THE FOLLOWING ARE THE DATA

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DATA FILE - MONITOR SAMPLE FROM PM 3, 600 POSITIONING AND 2-CYCLE DEPLETION.

DATA WAS THEN RETRIEVED SUCCESSFULLY FROM INTERFACE FILES CONTROL ROOMS AND GROSSLY (VERSION 2.1)

THE FOLLOWING RECORDS ON FILE COULD HAVE BEEN PROCESSED DURING SNOW SHUTDOWNS

CONTENTS OF BOOKING RECORD OF FILE CONTROL

[illegible][illegible][illegible]

8 - 330WAVCHANNI AD NBERMUN 01 - 3NCZ 457 91 - 3NCZ 4501 9 - 3NCZ 40 NBERMUN 1 - LAB ZEN 600 PHILCOLALBUB

NUMBER OF INTERCHANGES = 1

WANT TO GET THE BEST DEAL ON YOUR CAR?

DATE 06-08-2009 TIME 17:43:43

06-09-08
0000
0000
0000

COPIES
0-2-25-60
1000
JAN 3

[illegible][illegible]

00-260000-1 1000 6-5 1000
0 1000 1 1000 1000 1000

1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

[illegible][illegible]

APR 21 1968

 

STATION 215 ON VALLEY FAN

	(X(1))	(X(2))	(X(3))	(X(4))	(X(5))	(X(6))	(X(7))	(X(8))	(X(9))	(X(10))	(X(11))	(X(12))	(X(13))	(X(14))	(X(15))	(X(16))	(X(17))	(X(18))	(X(19))	(X(20))	(X(21))	(X(22))	(X(23))	(X(24))	(X(25))	(X(26))	(X(27))	(X(28))	(X(29))	(X(30))	(X(31))	(X(32))	(X(33))	(X(34))	(X(35))	(X(36))	(X(37))	(X(38))	(X(39))	(X(40))	(X(41))	(X(42))	(X(43))	(X(44))	(X(45))	(X(46))	(X(47))	(X(48))	(X(49))	(X(50))	(X(51))	(X(52))	(X(53))	(X(54))	(X(55))	(X(56))	(X(57))	(X(58))	(X(59))	(X(60))	(X(61))	(X(62))	(X(63))	(X(64))	(X(65))	(X(66))	(X(67))	(X(68))	(X(69))	(X(70))	(X(71))	(X(72))	(X(73))	(X(74))	(X(75))	(X(76))	(X(77))	(X(78))	(X(79))	(X(80))	(X(81))	(X(82))	(X(83))	(X(84))	(X(85))	(X(86))	(X(87))	(X(88))	(X(89))	(X(90))	(X(91))	(X(92))	(X(93))	(X(94))	(X(95))	(X(96))	(X(97))	(X(98))	(X(99))	(X(100))	(X(101))	(X(102))	(X(103))	(X(104))	(X(105))	(X(106))	(X(107))	(X(108))	(X(109))	(X(110))	(X(111))	(X(112))	(X(113))	(X(114))	(X(115))	(X(116))	(X(117))	(X(118))	(X(119))	(X(120))	(X(121))	(X(122))	(X(123))	(X(124))	(X(125))	(X(126))	(X(127))	(X(128))	(X(129))	(X(130))	(X(131))	(X(132))	(X(133))	(X(134))	(X(135))	(X(136))	(X(137))	(X(138))	(X(139))	(X(140))	(X(141))	(X(142))	(X(143))	(X(144))	(X(145))	(X(146))	(X(147))	(X(148))	(X(149))	(X(150))	(X(151))	(X(152))	(X(153))	(X(154))	(X(155))	(X(156))	(X(157))	(X(158))	(X(159))	(X(160))	(X(161))	(X(162))	(X(163))	(X(164))	(X(165))	(X(166))	(X(167))	(X(168))	(X(169))	(X(170))	(X(171))	(X(172))	(X(173))	(X(174))	(X(175))	(X(176))	(X(177))	(X(178))	(X(179))	(X(180))	(X(181))	(X(182))	(X(183))	(X(184))	(X(185))	(X(186))	(X(187))	(X(188))	(X(189))	(X(190))	(X(191))	(X(192))	(X(193))	(X(194))	(X(195))	(X(196))	(X(197))	(X(198))	(X(199))	(X(200))	(X(201))	(X(202))	(X(203))	(X(204))	(X(205))	(X(206))	(X(207))	(X(208))	(X(209))	(X(210))	(X(211))	(X(212))	(X(213))	(X(214))	(X(215))	(X(216))	(X(217))	(X(218))	(X(219))	(X(220))	(X(221))	(X(222))	(X(223))	(X(224))	(X(225))	(X(226))	(X(227))	(X(228))	(X(229))	(X(230))	(X(231))	(X(232))	(X(233))	(X(234))	(X(235))	(X(236))	(X(237))	(X(238))	(X(239))	(X(240))	(X(241))	(X(242))	(X(243))	(X(244))	(X(245))	(X(246))	(X(247))	(X(248))	(X(249))	(X(250))	(X(251))	(X(252))	(X(253))	(X(254))	(X(255))	(X(256))	(X(257))	(X(258))	(X(259))	(X(260))	(X(261))	(X(262))	(X(263))	(X(264))	(X(265))	(X(266))	(X(267))	(X(268))	(X(269))	(X(270))	(X(271))	(X(272))	(X(273))	(X(274))	(X(275))	(X(276))	(X(277))	(X(278))	(X(279))	(X(280))	(X(281))	(X(282))	(X(283))	(X(284))	(X(285))	(X(286))	(X(287))	(X(288))	(X(289))	(X(290))	(X(291))	(X(292))	(X(293))	(X(294))	(X(295))	(X(296))	(X(297))	(X(298))	(X(299))	(X(300))	(X(301))	(X(302))	(X(303))	(X(304))	(X(305))	(X(306))	(X(307))	(X(308))	(X(309))	(X(310))	(X(311))	(X(312))	(X(313))	(X(314))	(X(315))	(X(316))	(X(317))	(X(318))	(X(319))	(X(320))	(X(321))	(X(322))	(X(323))	(X(324))	(X(325))	(X(326))	(X(327))	(X(328))	(X(329))	(X(330))	(X(331))	(X(332))	(X(333))	(X(334))	(X(335))	(X(336))	(X(337))	(X(338))	(X(339))	(X(340))	(X(341))	(X(342))	(X(343))	(X(344))	(X(345))	(X(346))	(X(347))	(X(348))	(X(349))	(X(350))	(X(351))	(X(352))	(X(353))	(X(354))	(X(355))	(X(356))	(X(357))	(X(358))	(X(359))	(X(360))	(X(361))	(X(362))	(X(363))	(X(364))	(X(365))	(X(366))	(X(367))	(X(368))	(X(369))	(X(370))	(X(371))	(X(372))	(X(373))	(X(374))	(X(375))	(X(376))	(X(377))	(X(378))	(X(379))	(X(380))	(X(381))
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MEMOY NUMBER	DATE	TIME	LOCATION	REMARKS
1077	10/10/77	10:00	1000000000	1000000000
1078	10/10/77	10:00	1000000000	1000000000
1079	10/10/77	10:00	1000000000	1000000000
1080	10/10/77	10:00	1000000000	1000000000
1081	10/10/77	10:00	1000000000	1000000000
 

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NUM 1715 - MONITOR SAMPLE PROBLEM 3, ROD POSITIONING AND 2-CYCLE DEPLETION.

NEW-TN-LATEST VERSION OF YNADN DOES NOT EXIST FOR IX(1) OPTION = -4; WILL USE LATEST VERSION

DATA HAS BEEN REVIEWED SUCCESSFULLY FROM INTERFACE FILES CONTROL ROOMS INDEXED INDEXED INDEXED (VERSION 1)

DATA HAS BEEN RETRIEVED SUCCESSFULLY FROM INTERFACE FILES VYATON

THE FOLLOWING RECORDS ON FILE CONTROL HAVE BEEN PROCESSED DURING PRIORS PERIODS

CONTENTS OF BOXING RECORD OF WILE CONTROL

	$x(1)$	$x(2)$	$x(3)$	$x(4)$	$x(5)$	$x(6)$	$x(7)$	$x(8)$	$x(9)$
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	0.0	0.0	0.						

[illegible]

ENCLOSURE 0. N.Y. 64-15749-10000 FILE - MAY 30

CONSIDERING THE FACTS SET FORTH IN THE ABOVE
MEMORANDUM, IT IS RECOMMENDED THAT THE
FOLLOWING ACTION BE TAKEN: 1. LAST PAGE - 10

24 LAST ZONE = 24
 25 FIRST ZONE = 25
 26 NUMBER OF ZONES = 26
 27 SET = 27
 28 COORDINATING FOR VOT SET = 28

DECLINE NEWSPAPERS IN 2000-FOLLOWING YEARS

1 40440 1 445 207 ml 71 ANO2

2000 1999 1998 1997 1996 1995 1994 1993 1992 1991 1990 1989 1988 1987 1986 1985 1984 1983 1982 1981 1980 1979 1978 1977 1976 1975 1974 1973 1972 1971 1970 1969 1968 1967 1966 1965 1964 1963 1962 1961 1960 1959 1958 1957 1956 1955 1954 1953 1952 1951 1950 1949 1948 1947 1946 1945 1944 1943 1942 1941 1940 1939 1938 1937 1936 1935 1934 1933 1932 1931 1930 1929 1928 1927 1926 1925 1924 1923 1922 1921 1920 1919 1918 1917 1916 1915 1914 1913 1912 1911 1910 1909 1908 1907 1906 1905 1904 1903 1902 1901 1900

Year	1994-2000	2001-2004	2005-2009
2000	1.00	1.00	1.00
2001	1.00	1.00	1.00
2002	1.00	1.00	1.00
2003	1.00	1.00	1.00
2004	1.00	1.00	1.00
2005	1.00	1.00	1.00
2006	1.00	1.00	1.00
2007	1.00	1.00	1.00
2008	1.00	1.00	1.00
2009	1.00	1.00	1.00
2010	1.00	1.00	1.00
2011	1.00	1.00	1.00
2012	1.00	1.00	1.00
2013	1.00	1.00	1.00
2014	1.00	1.00	1.00
2015	1.00	1.00	1.00
2016	1.00	1.00	1.00
2017	1.00	1.00	1.00
2018	1.00	1.00	1.00
2019	1.00	1.00	1.00
2020	1.00	1.00	1.00
2021	1.00	1.00	1.00
2022	1.00	1.00	1.00
2023	1.00	1.00	1.00
2024	1.00	1.00	1.00
2025	1.00	1.00	1.00
2026	1.00	1.00	1.00
2027	1.00	1.00	1.00
2028	1.00	1.00	1.00
2029	1.00	1.00	1.00
2030	1.00	1.00	1.00
2031	1.00	1.00	1.00
2032	1.00	1.00	1.00
2033	1.00	1.00	1.00
2034	1.00	1.00	1.00
2035	1.00	1.00	1.00
2036	1.00	1.00	1.00
2037	1.00	1.00	1.00
2038	1.00	1.00	1.00
2039	1.00	1.00	1.00
2040	1.00	1.00	1.00
2041	1.00	1.00	1.00
2042	1.00	1.00	1.00
2043	1.00	1.00	1.00
2044	1.00	1.00	1.00
2045	1.00	1.00	1.00
2046	1.00	1.00	1.00
2047	1.00	1.00	1.00
2048	1.00	1.00	1.00
2049	1.00	1.00	1.00
2050	1.00	1.00	1.00
2051	1.00	1.00	1.00
2052	1.00	1.00	1.00
2053	1.00	1.00	1.00
2054	1.00	1.00	1.00
2055	1.00	1.00	1.00
2056	1.00	1.00	1.00
2057	1.00	1.00	1.00
2058	1.00	1.00	1.00
2059	1.00	1.00	1.00
2060	1.00	1.00	1.00
2061	1.00	1.00	1.00
2062	1.00	1.00	1.00
2063	1.00	1.00	1.00
2064	1.00	1.00	1.00
2065	1.00	1.00	1.00
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2067	1.00	1.00	1.00
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DEUTERON FISSION CONVERSION RATIO IS 4.422410-01, ESTIMATE FOR CRITICAL SYSTEM IS 1.748000-01
FISSION REPRODUCTION PER UNIT ENERGY (ATOMS/WATT-SEC) IS 3.012810 10

GROUP FLUX VALUES AT PLANE 1, ROW 4 COLUMN 4 = POINT AT PILOT GROUP MAXIMUM
0.200000 13 0.333000 13 0.120000 13 0.334000 13

MINIMUM PILOT GROUP FLUXES BY ZONE

0.411000 13 0.414000 13 0.200000 13 0.210000 13 0.400000 13 0.420000 13 0.420000 13 0.420000 13
0.410000 13 0.410000 13 0.200000 13 0.210000 13 0.400000 13 0.420000 13 0.420000 13 0.420000 13
0.410000 13 0.410000 13 0.200000 13 0.210000 13 0.400000 13 0.420000 13 0.420000 13 0.420000 13

THE MAXIMUM POWER DENSITY IS AT PLANE 1, ROW 12, AND COLUMN 2 AND IS 7.930847750 00 WATTS/CC.

THE MAXIMUM NEUTRON DENSITY IS AT PLANE 1, ROW 13, AND COLUMN 1 AND IS 2.557823510 00 NEUTRONS/CC.

THE MAXIMUM POWER DENSITY (WATTS/CC) IN EACH ZONE IS

0.200000 00 0.400000 00 0.400000 00 0.400000 00 0.400000 00 0.400000 00 0.400000 00 0.400000 00
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THE RELATIVE POWER DENSITY TRAVERSE LEFT-TO-RIGHT IS

0.5 1.000000 00 0.000000 00 0.000000 00 0.000000 00 0.000000 00 0.000000 00 0.000000 00
0.000000 00 0.000000 00 0.000000 00 0.000000 00 0.000000 00 0.000000 00 0.000000 00

THE RELATIVE POWER DENSITY TRAVERSE TOP-TO-BOTTOM IS

0.5 0.000000 00 0.000000 00 0.000000 00 0.000000 00 0.000000 00 0.000000 00 0.000000 00
0.000000 00 0.000000 00 0.000000 00 0.000000 00 0.000000 00 0.000000 00 0.000000 00

TOTAL RUN TIME IS 0.100 MINUTES AND TOTAL CLOCK TIME IS 0.594 MINUTES

START EXECUTING REACTION RATE MODULE

END TIME = 000000 SAMPLE PERIOD IS 1.000 MINUTES AND 2-CYCLE DEVIATIONS

REACTION RATE MODULE INPUTS (REACTIVE) ARE NOT ON LINE - DEFAULT TO MINIMUM OUTPUT

REACTOR CONTROL ADDRESS, CONTROL 1

MAXIMUM GROUP SIZE USED FOR INITIAL REACTING IS 1000

STORAGE SOLUTION FOR BASIC DATA IS 1000

STORAGE SOLUTION IS 1000

MAXIMUM STORAGE SOLUTION IS 1000

MINIMUM STORAGE SOLUTION IS 1000

GROUPS = 1 GROUP = 1 GROUP = 1

GROUPS ACROSS FILE 24 GROUPS 24 GROUPS 24 GROUPS 24 GROUPS 24 GROUPS 24 GROUPS 24 GROUPS 24 GROUPS

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ENDOD SAMPLE PROBLEM 3. ROD POSITIONING AND 2-CYCLE DEPLETION.

SUMMARY TABLE OF NEUTRON LOSS, PLUX WEIGHTED
NORMALIZED WITH 3.87486E-07 K-EFFECTIVE IS 1.002916

ZONE CLASS	FISSILE	PERTILE	0. ACTINIDE	FISSION PROD	STRUCTURAL	CONTROL ROD
1	0.0100000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
2	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
3	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
SUM	0.0100000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

SUMMARY TABLE OF OTHER INFORMATION

ZONE CLASS	FISSION	CONVERSION	FISSION	TOTAL
1	2	3	4	5
1	0.0000000	0.0000000	0.0000000	0.0000000
2	0.0000000	0.0000000	0.0000000	0.0000000
3	0.0000000	0.0000000	0.0000000	0.0000000
SUM	0.0000000	0.0000000	0.0000000	0.0000000
TOTAL LOSS	0.0000000	0.0000000	0.0000000	0.0000000

A BETTER ESTIMATE OF THE SPTL CONVERSION RATIO FOR A CRITICAL SYSTEM IS 0.010000
(FOR THE CASE CRITICAL BY CHANGING CONTROL ABSORPTIONS ON LEADERS)

FISSION CONVERSION/UNIT ENERGY GENERATION IS 1.010000E-16 KGS/WATT-SEC
FISSION CONVERSION RATE IS 1.010000E-16 KGS/SEC

RELATIVE BURNING TIME (YEARS) OF THE ABOVE FISSION INVENTOR, (ONE PLAN) IS 3.000000
NOTE - CONVERSION RATIO = (CAPTURE IN FISSION/ABSORPTION IN FISSION)

III. PROGRAMMING INFORMATION

This section presents information of primary use to the individual implementing this code. Information is given about the subroutines, I/O requirements, program overlay, and local adaptation.

A. Source Program

Most of the programming in this code is FORTRAN language. However, some service routines are in machine dependent IBM ASSEMBLER language. Figure 7 lists the names of the subroutines and their use. The source program consists of 25 routines totaling approximately 5,000 cards.

B. Program Implementation

This code is not a stand-alone code and must be implemented in a modular environment under compatible rules.

The data used in this code is variably dimensioned and therefore the core storage requirements are a function of the problem to be solved. On the IBM-360 model computers, the program plus system routines require approximately 20,000 words of core storage when the code is loaded with the recommended overlay structure shown in Figure 8. The core storage for data is supplied by the user at run time.

The local computer configurations and basic job control instructions are documented in reference 3. I/O unit requirements include the standard interface files CONTRL, RODSET, NOXSFR, ZNATDN, GEODST, and YNATDN, which is identical in structure to ZNATDN, and at most four scratch files.

C. Conversion to Other Computers

Alphanumeric characters are carried in the guise of real numbers (Hollerith) as A(6) requiring long-word storage on an IBM machine.

As a convenience for conversion, a multiplier is carried through the routines, MULT or NDP or LX(39), which must be 2 for an IBM machine and 1 for long-word machines. This multiplier adjusts the lengths of words for short-word storage and manipulations avoiding extensive reprogramming upon conversion.

FIGURE 7. SUBROUTINES AND THEIR USE.

C MAIN - MAIN PROGRAM.
 C STPT - GETS CORE STORAGE, STARTS CALCULATION, FREES CORE STORAGE.
 C INTL - GETS DATA FROM INTERFACE FILES.
 C CRCP - CALCULATES CALCULATION.
 C GDSI - COPIES FILE 'GECDSI'.
 C CREK - DOES SOME ERROR CHECKING.
 C AB9T - ADDES 8D AND 9D RECORDS ONTO FILE 'RODSET'.
 C REDE - READS INTERFACE FILE 'RODSET'.
 C IDIT - INITIAL EDITS.
 C POS1 - DOES THE POSITIONING FOR IX(10)=-3 OR -4.
 C POS2 - DOES THE POSITIONING FOR IX(10)=-2 AND -1.
 C POS3 - DOES THE POSITIONING FOR IX(11).GT.0.
 C POS4 - CONTROLS THE POSITIONING FOR IX(10).GE.0.
 C NOF0 - DOES THE POSITIONING FOR NOP=0.
 C NOF1 - DOES THE POSITIONING FOR NOP=1.
 C NOF2 - DOES THE POSITIONING FOR NOP=2.
 C GDSW - COPIES FILE 'GECDSI'.
 C SAVE - SAVES DATA ON FILE 'RODSET'.
 C PRIB - UTILITY PRINT ROUTINE.
 C PRIT - UTILITY PRINT ROUTINE.
 C PRTE - UTILITY PRINT ROUTINE.
 C PRTH - UTILITY PRINT ROUTINE.
 C FITE - I/O ROUTINE.
 C SEEK - INTERFACE FILE MANAGER.
 C FEER - ERROR STOPPER.
 C TIMER - GETS TIME, DATE, ETC.
 C ITIME - ASSEMBLY - GETS ELAPSED CLOCK TIME.
 C GFTCOR - ASSEMBLY - GETS CORE STORAGE.
 C PRECOR - ASSEMBLY - FREES CORE STORAGE.

FIGURE 8. RECOMMENDED OVERLAY STRUCTURE.

OVERLAY ONE
INSERT INTL
OVERLAY ONE
INSERT CCRB
OVERLAY TWO
INSERT GDST, A89D, REDF, GETI, IDIT, CNEK
OVERLAY TWO
INSERT PCS1
OVERLAY TWO
INSERT PCS2
OVERLAY TWO
INSERT PCSH
OVERLAY TWO
INSERT PCS4
OVERLAY THREE
INSERT NCP0
OVERLAY THREE
INSERT NCP1
OVERLAY THREE
INSERT NOP2
OVERLAY TWO
INSERT SAVE, GDSW

The following basic changes are required for use on a long-word machine:

- 1) Remove all REAL*8 statements.
- 2) Supply single precision library functions, e.g., SQRT and EXP instead of DSQRT and DEXP.
- 3) Change all references to "Double Precision," as in function definition statements.
- 4) Change LX(39) to 1 from 2.
- 5) Change the apostrophes which delimit alphanumeric strings in FORMAT and DATA statements.
- 6) Replace the subroutine TIMER to provide informatio., from the local system,
 - ICLOCK -- gives cpu time
 - ITTIME -- gives clock time
 - MODEL -- gives computer model
 - IDAY -- gives alphanumeric: month=day-year
 - JSTIME -- gives cpu time remaining
 - JOBNUM -- gives alphanumeric: job number
 - ILEFT -- gives the number of I/O's remaining
 - TIME -- gives alphanumeric: time of day
- 7) Satisfy the data access, transfer requirements.
- 8) Provide local capability to allocate memory at run time, or fix the allocations for container arrays and communication.
- 9) Provide the necessary overlay structure.
- 10) The assembly language routines can only be used on compatible IBM machines (otherwise use the FORTRAN source decks).
- 11) Correct any discrepancies missed by the IBM compiler (and please report this information back to us).

Local system routines would be needed to satisfy items 6, 7, and 8, unless those supplied are compatible.

The code is used locally as a module of a computation system. Effecting stand-alone capability should not be hard using those modules needed including input data processing capability. It should be most attractive to implement an equivalent modular system, either one-to-one with that in use at ORNL, or adapt the modules into another system.

D. Limitations

Certain features of the standard interface data file specifications imply capability which is not available. Quite generally, it has been assumed that the data is simply blocked in the files. No provision has been made to account for partially filled records, for example.

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