

BNL--52245

DE90 014815

RETRAN/MINET COMPOSITE CODE DOCUMENTATION

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Printed in the United States of America
Available from
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road
Springfield, VA 22161

NTIS price codes:
Printed Copy: A14; Microfiche Copy: A01

ABSTRACT

The RETRAN/MINET Composite Code, based on RETRAN 02 MOD 4 and MINET Version 1.10, is described. The objective in developing RETRAN/MINET was to extend the degree to which complex thermal-hydraulic systems can be analyzed, while providing the capability to use detailed RETRAN modeling of the reactor and other components, where needed. The MINET Code was originally developed for the analysis of complex balance of plant (BOP) thermal-hydraulic systems and already serves that purpose in support of RAMONA-3B for BWR analyses and SSC for LMR analyses. The project was sponsored by the Empire State Electric Energy Research Corporation (ESEERCO), with computer and engineering support provided by the New York Power Authority (NYPA).

A "modular" interfacing technique was utilized, in that there is very little change in the programming of either individual code, except that the MINET driver program is discarded and major sub-drivers are called from the appropriate locations within RETRAN. One new common block was added to act as a buffer between the data structures for each code. During execution, boundary conditions at the interface are exchanged via this buffer, and each code sees only the "normal" boundary conditions - although some of the user's boundary conditions are overwritten at interface boundaries. A major advantage of this approach is that the interface is very localized, which is helpful for testing and makes upgrading to newer versions of RETRAN and MINET relatively straightforward.

Preliminary testing established proper code performance and data transmission, as well as stability under transient conditions. Two test transients postulated for the H. B. Robinson Plant were simulated using a two loop RETRAN/MINET representation extending to the condenser, and the results were compared against those generated using RELAP5. In addition, the RETRAN model was extended directly to the condenser and the transients were re-run. This provided for a three-way comparison between RETRAN/MINET, RELAP5, and RETRAN (alone). The results generated using RETRAN/MINET and RETRAN were very similar, which again indicates that the interface is performing correctly. The RETRAN/MINET representation through the feedwater train executed about 20% faster than in the RETRAN (alone) case, although more substantial improvements are expected for more complex systems. Both of these results were similar to the RELAP5 results, although there were enough differences in modeling and control system representations to make that comparison inconclusive. However, the principal objective of establishing correct performance of the composite code has been achieved.

Information regarding composite code modeling, programming and utilization is provided. Sample input and output are also included.

EXECUTIVE SUMMARY

This report documents the coupling of two established thermal hydraulic codes, RETRAN and MINET, into an integrated RETRAN/MINET code with enhanced capabilities for power plant simulation. In a composite RETRAN/MINET representation, RETRAN is generally used to represent the reactor and adjacent system, and MINET is used to represent the balance of plant.

The RETRAN computer program is the result of an extensive code development effort sponsored by EPRI since 1975. EPRI's objective was to provide a versatile and reliable thermal hydraulic code which could be used for best estimate analysis of light water reactor systems. Until very recently, RETRAN-02/MOD 003 has been the latest version of the code available to the industry. This version of the code has been verified by EPRI and evaluated by NRC. The RETRAN code also has sufficient flexibility, along with a special turbine model, to represent a portion of the balance (BOP) of the plant. However, the component models in the RETRAN/BOP representation are based on the same sophisticated modeling as is used for the primary side. In many transients, such as during a pressurized thermal shock case, an extensive model of the balance of plant (BOP) is needed. The RETRAN models, based on the same level of sophistication as the primary side, are very expensive for this type of application.

The MINET code is based on a momentum integral network formulation and was designed for simulating large and complex systems such as the balance of plant. It is written in FORTRAN and was designed to be easily interfaced with other computer codes. MINET has also been interfaced with SSC, for LMR systems, and RAMONA-3B for BWR Systems, and the composite representations utilized for a number of transient analyses.

The objective was to develop a RETRAN/MINET interface so that a composite representation of the entire plant system could be implemented. The interfacing is generalized so that the user can utilize the two available models in various combinations, depending on the modeling needs. The process of testing and validating the RETRAN/MINET Composite Code was made easier by the fact that both RETRAN and MINET had been previously validated (for many applications) which allowed the developers to focus on the interface itself.

One of the guiding principles in developing an interface to combine these codes has been to preserve both codes. The connection is made through boundary conditions in both codes. This technique required addressing two basic problems; matching the thermal hydraulic conditions at the interface based on individual code requirements and establishing a sequence of computation between two codes.

It was decided that RETRAN would serve as the "host" code and that MINET sub-drivers - for input processing, steady-state calculations, and for transient calculations - would be spliced into the RETRAN programming. This was possible due to the modular structure of MINET, as the code was designed with such interfacing envisioned. As a result, the MINET processing became embedded into the RETRAN input processing, steady-state calculations and transient calculations.

As a result of the interfacing, only three RETRAN subroutines were directly impacted. None of the MINET subroutines were altered, although the main program ("MINET") was effectively displaced in the calculation procedure. Of the nine new subprograms (either subroutines or functions) only three are of significant length and complexity.

Normally, the RETRAN User inputs time dependent tables at boundary nodes to specify the RETRAN problem. Similarly, the MINET User would input time dependent tables to specify the boundaries of the MINET problem. In the coupled RETRAN-MINET code, these former boundaries to the stand-alone RETRAN code and the stand-alone MINET code become the transfer nodes for RETRAN and MINET to exchange information (e.g., thermodynamic state variables that the separate RETRAN and MINET codes need to perform their respective parts of the combined calculation). Immediately prior to the calls to MINET, all common boundary data needed by MINET is sent from RETRAN. Immediately after the return from MINET, the RETRAN boundary values are updated by new values from MINET.

The Composite Code was developed on CDC computers, but was later converted to run on an IBM-3090. Export to most utilities should be routine, as there are few machine-dependencies in the programming.

Potential applications envisioned for RETRAN/MINET include the following:

- Operational Transients and Safety Analysis
- Audit Calculations
- Parametric Studies and Stability Analysis
- Plant Start-Up Analysis
- Emergency Response Guidelines
- Pressurized Thermal Shock Evaluation
- Control System Studies
- Component Reliability Analysis and Support of Risk Assessment
- Identification of Accident Signatures and Root-Cause Analysis
- BWR ATWS Analysis
- "Inverse" Applications, such as Water Hammer
- Integrated Control System Failure (e.g. Rancho Seco)
- Simulator Assessment

In almost all cases, the increased analytical capability is the direct result of gaining greater flexibility and range (of detail) through the use of the Composite Code. If the user is able to determine design details of any portion of the plant system that could be pertinent under some conditions, that user should be able to factor the design and performance of that subsystem into the RETRAN/MINET system representation.

ACKNOWLEDGEMENTS

This interfacing of the RETRAN and MINET Codes, and the validation studies were sponsored by the Empire State Electric Energy Research Corporation (ESEERCO). We gratefully acknowledge the efforts of Dr. James Burger of ESEERCO for helpful comments and feedback during the development and subsequent conduct of the project.

Cofunding by the New York Power Authority (NYPA) is also gratefully acknowledged. The efforts of Dr. George Grochowski, and Dr. Muzaffer Karasulu in providing technical input and acquiring needed data and authorizations were crucial to the success of this project. Ms. Kornelia Szwarc, also from NYPA was a willing and able initial user of the Composite Code, and we are grateful for her contribution.

Dr. J. H. Jo performed some of the RETRAN calculations used in testing RETRAN/MINET and his contribution is gratefully acknowledged.

This code documentation was edited by Dr. James Guppy, Head of the Reactor Analysis Division at Brookhaven National Laboratory. It was skillfully typed and processed by Mrs. Linda Hanlon, Mrs. Patricia Quit and Mrs. Kathy Ratto.

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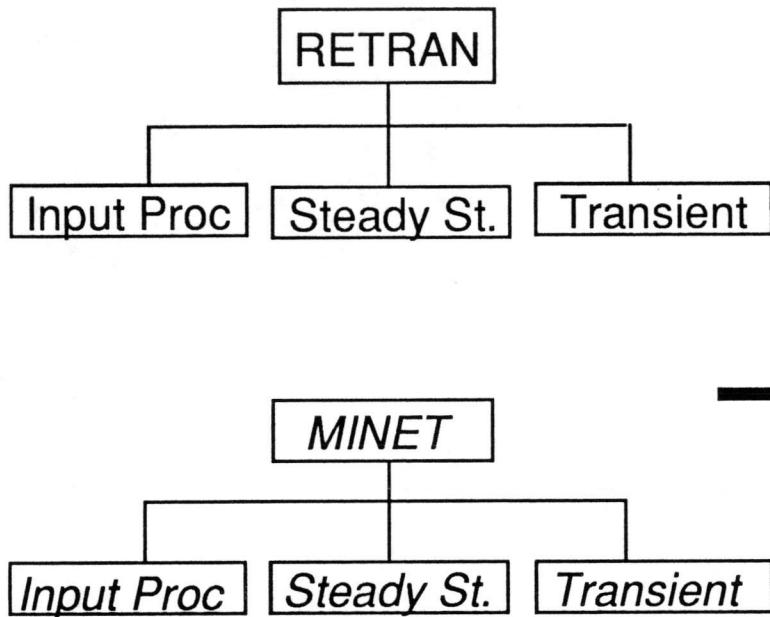
1. INTRODUCTION

The RETRAN/MINET Composite Code consists of the RETRAN-02 MOD04 program [Ref.1] library, most of the MINET Version 1.10 [Ref. 2] program library, a few hundred lines of updates to the RETRAN program library, and nine new subprograms (subroutines or functions). This is illustrated in Figure 1-1. As both RETRAN and MINET are documented elsewhere (in great detail), we focused herein on the interface that links these programs, as well as the utilization of the Composite Code.

Sections 2 through 5 of this document are devoted to modeling and programming of the interface, including code modifications and revised programming. For an individual exercising RETRAN/MINET, Section 3 provides the essential information, with Figures 3-5 and 3-7 illustrating the most important factors in developing input data.

The RETRAN/MINET Composite Code currently (5/90) resides on an IBM-3090 mainframe computer at Brookhaven National Laboratory. (Export to similar IBM mainframe computers owned by ESEERCO member utilities is expected to take place in the latter half of 1990). Information needed for exercising the code on that machine is provided in Section 6. Sample input and printout are discussed in Section 7.

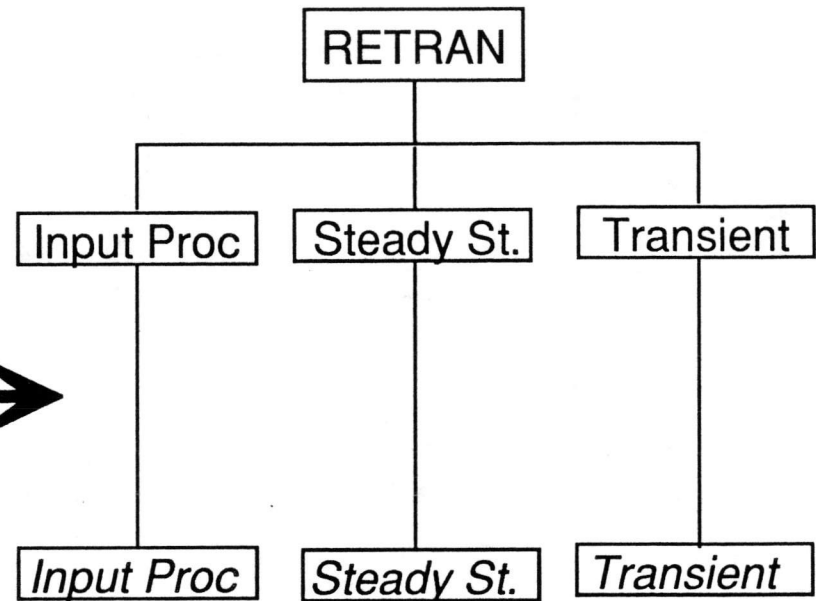
RETRAN and MINET Independently



Boundary Conditions:
 RETRAN - User Input
 MINET - User Input

Variations : Sometimes Control System
 Adjusts Boundary Conditions
 (Example : Control Valve Position)

RETRAN/MINET Composite Code



Boundary Conditions:
 RETRAN & MINET-No Changes
 RETRAN/MINET Interface-Linkage Data
 During Transient-Codes Over Write
 User Specified Tables At Interface

Variations-RETRAN Controllers Available
 in RETRAN Portion Only

Figure 1-1. Modular Interfacing of RETRAN and MINET

2. INTERFACE MODELING

RETRAN02/MOD4 [Ref. 1] has two types of formulations; homogeneous-equilibrium (HEM) and non-homogeneous equilibrium. In case of the non-homogeneous model, the interfacial momentum transfer is described by either algebraic slip or dynamic slip. The formulation consists of mass, momentum, and energy balance equations for the mixture. The dynamic slip model requires an additional momentum equation. In addition to the balance equations, the code also has closure conditions for wall heat transfer, wall friction (three options) and flow regimes.

RETRAN has three types of boundary conditions; Time Dependent Volume (TDV), Fill, and Critical Flow. The Time Dependent Volume prescribes fluid pressure, temperature, quality and the level in the volume. The Fill is used to specify flow rate, pressure or temperature, quality and level. The Critical Flow is not a true boundary condition and can be applied at any location in the system. The set of equations is reduced to algebraic equations by finite difference. A staggered mesh approach (tank & tube) is used. The mass and energy balances are applied to each volume, while the momentum balance is applied to a staggered volume centered at the junction. The system of equations (including equation of state) is solved for local pressures and other flow variables. This objective of estimating local pressures causes stiffness in the system and increases the computer time requirement.

The MINET code [Ref. 2] is a homogeneous equilibrium code with a momentum integral [Refs. 3 & 4] approach. The code derives its cost effectiveness from the integral approach and also from water property estimate at one average pressure for a whole segment, consisting of many calculational volumes. This code has two types of boundary modules, representing system inlets and outlets. For the steady state, the user must specify inlet flows and outlet pressures. During the transient, either parameter may be specified.

One of the guiding principles in developing an interface to combine these codes has been to preserve both codes and to include this interface in RETRAN. The connection is made through boundary conditions in both codes. This required addressing two basic problems; matching the thermal hydraulic conditions at the interface based on individual code requirements and establishing a sequence of computation between two codes. The connection requires the boundary conditions for one of the codes to lag the other code.

2.1 Matching Thermal Hydraulic Conditions

If the HEM formulation is used in the RETRAN application, there is no conflict with the MINET representation. Alignment of the nodes and the correct exchange of data is the only challenge, and that is discussed in Section 3.

If the non-homogeneous equilibrium RETRAN formulation is used, one has to be careful regarding interface conditions. For an interface in subcooled or superheated flow regimes the flow is essentially single phase and the non-homogeneous equilibrium representation is no longer relevant. However, if the interface is in a two-phase flow region there is the potential for inaccuracies at the interface. This could result from the RETRAN assumption of

unequal phase velocities and the MINET assumption of equal phase velocities. Such a discrepancy would likely lead to different liquid and vapor flow rates on the two sides of the interface, and one would have to determine that such a discrepancy would not significantly impact on the analysis.

The obvious way to minimize any such problems is to locate the interfaces only in subcooled or superheated regions. Given the planned applications for RETRAN/MINET, e.g., for nuclear plant coolant systems, it is very likely that most interfaces would be in areas of single phase flow. In fact, it would seem unlikely that a modeler would intentionally place the interface in a two-phase region - given the known differences in modeling. Thus, we have assumed that such an interface is not allowed, rather than confront an awkward problem.

2.2 Establishing Calculation Sequences

It was decided that RETRAN would serve as the "host" code, and that MINET sub-drivers - for input processing, steady-state calculations, and for transient calculations - would be spliced into the RETRAN programming. This was primarily due to the modular structure of MINET, as the codes was designed with such interfacing envisioned. As a result, the MINET processing became embedded into the RETRAN input processing, steady state calculations, and transient calculations.

2.2.1 Input Processing

The RETRAN and MINET input files were unchanged. A call to this extended MINET input processor from within the RETRAN input processor was the only change.

2.2.2 Steady State

RETRAN and MINET use different strategies regarding steady state solutions. With RETRAN, user estimates initial conditions throughout the thermal hydraulic system. MINET has a steady state solver, so the user specifies boundary conditions and the code will balance the system pressures, flows and temperatures. In practice both codes usually converge on steady state conditions. However, each code can have problems converging on intricate systems.

Rather than risk a nested iterative scheme that would be unpredictable at best, we chose to solve the RETRAN portion of the steady state first, and to then solve the MINET portion's steady state. In effect, the user is then performing an outer iteration in matching up the boundary conditions, as this is the type of task where human intelligence should be more reliable than "artificial" intelligence.

2.2.3 Transient

With the MINET transient package inserted in the RETRAN transient time stepping loop, both codes advance conditions to the end of the time step. RETRAN actually determines the time step size, but MINET can take multiple internal time steps to reach the objective end-of-step time.

One of the codes has to step first, which means it uses beginning of step (k) conditions at the interface boundaries. Once this code has advanced conditions to the end of the time step, the other code can access advanced step (k+1) conditions at the interface boundaries. This is a decided advantage with thermal-hydraulic analysis, as the numerics consistently perform better with implicit differencing, primarily due to the stiffness of the momentum equation. Further, for the next step, the first code receives updated (abruptly) information (beginning of the new step) at the interface boundary, and this could prove troublesome to the calculations.

Given that the code that steps first does have more challenging boundary conditions (i.e., abruptly changing), and that MINET is generally the more stable code due to (1) the integral momentum equation, and (2) the larger plant systems (BOP) simulated, we chose to step MINET before RETRAN. Thus, the current stepping process is as follows:

- a. MINET steps to k+1 using interface boundary values at step k and MINET boundary values at k+1. Conditions at the interface boundaries (from MINET) are advanced to step k+1.
- b. RETRAN steps to k+1 using interface boundary values at step k+1 and RETRAN boundary values at k+1. Conditions at the boundaries (from RETRAN) are advanced to step k+1.
- c. As an option, conditions at the interface boundaries can be examined, and an iterative step or a reduced in time step size could be implemented. To date, this has not been necessary. (All tests have indicated excellent stability.)
- d. MINET would then step to k+2, with the process cycling back to Step a.

There are two possible interface boundary types, MINET Outlet to RETRAN fill (M-R) and RETRAN TDV to MINET inlet (R-M), as shown in Figure 2-1. In the R-M interface, RETRAN sends flows and temperatures to MINET and MINET returns pressures and temperatures. In the M-R interface, MINET sends flow and temperature to RETRAN and RETRAN returns pressure and temperature. As MINET always steps first, it sends advanced time boundary values to RETRAN, while RETRAN sends trailing values to MINET.

For the M-R interface, the linkage is very clear, as the MINET nodal interface lines up exactly with the RETRAN fill junction. If the last MINET node is one-half the length of the first RETRAN node, the pressure and temperature from RETRAN align properly with MINET (see Figure 2-1). For the R-M interface, the RETRAN time-dependent volume boundary makes the situation more complex. It was necessary to exactly overlap the first MINET node with the RETRAN TDV. Thus RETRAN sends the TDV inlet junction flow and enthalpy to MINET, and MINET sends the corresponding junction pressure and enthalpy to RETRAN. Since the RETRAN TDV is assumed (within RETRAN) to have uniform pressure and enthalpy, utilization of MINET inlet values is appropriate.

2.3 The Control System Interface

During the course of this project, a control system interface became a priority item for development. The objective was to provide information regarding conditions within the MINET portion of the system to the RETRAN control system and to allow the user to control key MINET boundary conditions, e.g., pump speeds and valve positions, using the RETRAN control system. The challenge was to do this without giving RETRAN full access to MINET variables and without making major changes to either code library.

The current RETRAN control system was studied in order to determine how information could be sent into and taken out from that portion of RETRAN. It was determined that the user can build control blocks to suit his modeling needs, and that existing features of the RETRAN control system could be utilized for the composite code. Because the user can build control blocks having "output" that is not utilized in the RETRAN thermal-hydraulic calculations, it is relatively easy to divert such output into MINET for usage in setting a valve position, for instance. In transferring information from MINET into the RETRAN controller, we took advantage of the "Function Generator" tabular input. Normally, the user might specify a function $f(x)$ for key values of x , to be factored into some control block calculations. Once we determined that the "Function Generator" table could be time dependent, i.e., $f(t)$, this became the preferred means of transferring data in from MINET. The user simply specifies a small "dummy" Function Generator Table and then links some time dependent MINET parameter, e.g., feedwater temperature, to be transmitted into that table. (See Figure 2-2). The table then would contain old and new values for the parameter, as well as the old and new times, and this table is then updated every time MINET steps forward through a time step.

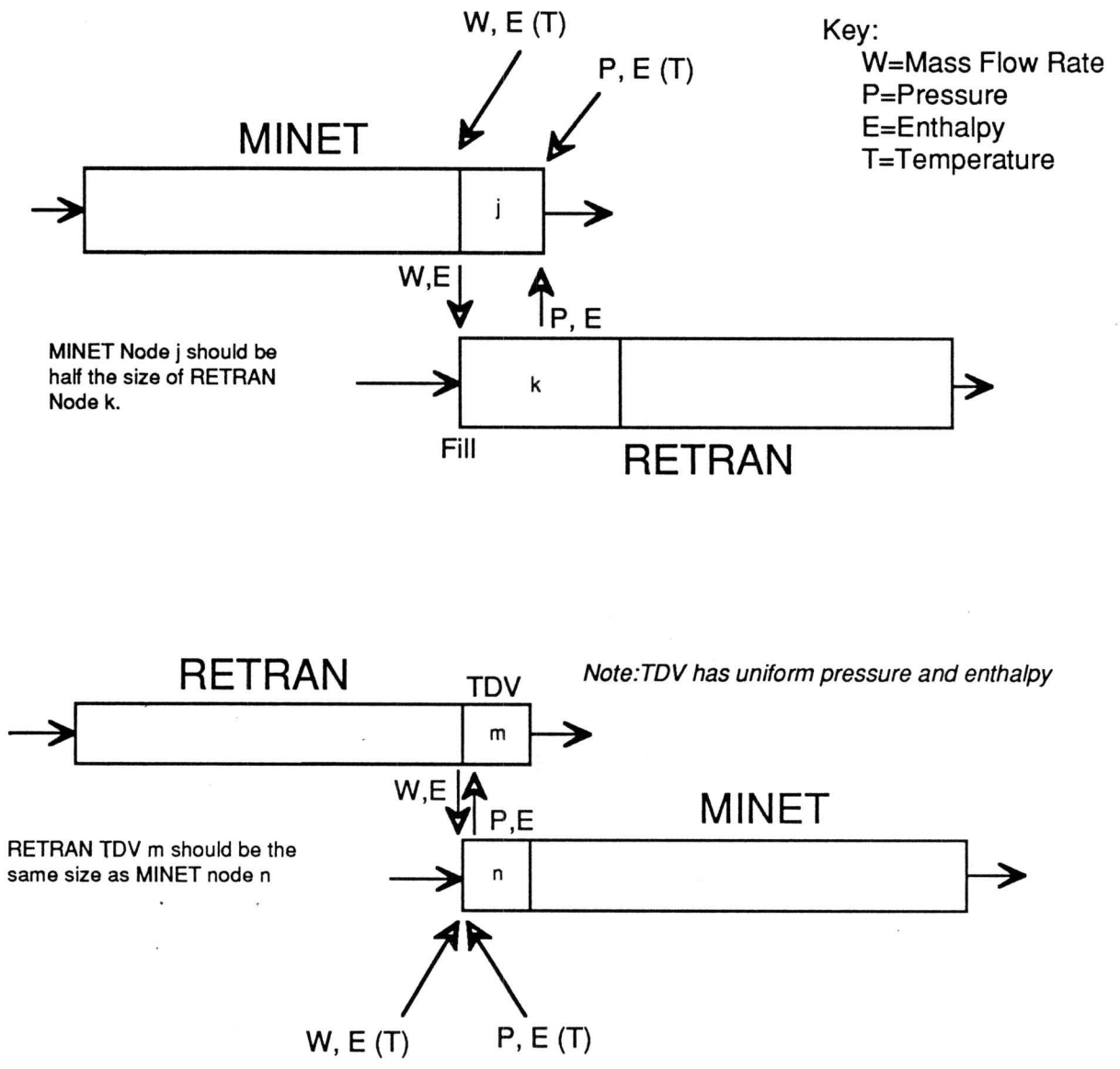


Figure 2-1. Local Nodalization Near Two Types of Interface Boundaries

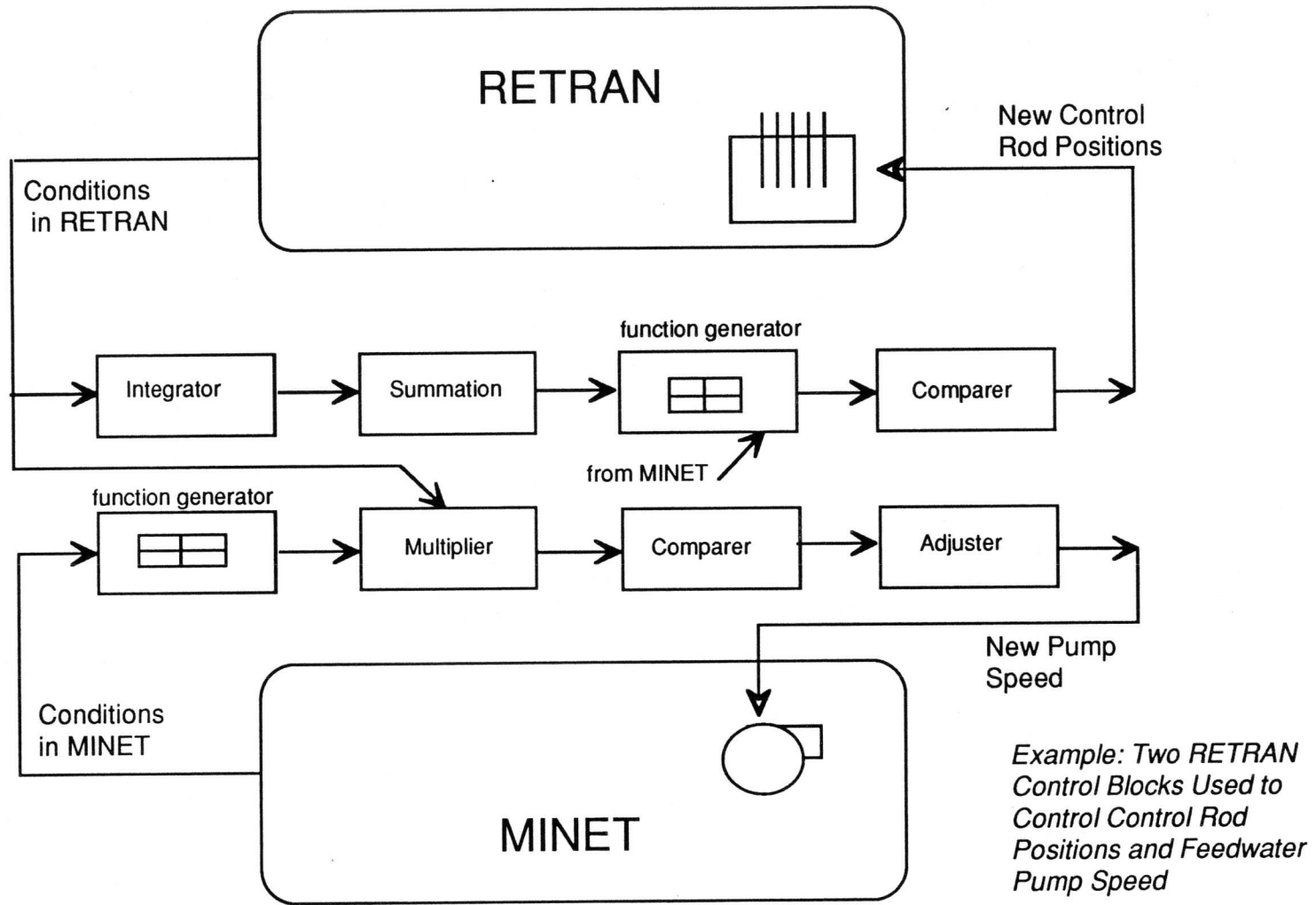


Figure 2-2. RETRAN Control Blocks Access Data from RETRAN and MINET and Can Control Parameters Within Both Systems

3. PROGRAMMING THE INTERFACE

The general objectives of programming the interface entailed coupling the computationally intensive RETRAN code with the more flexible MINET code, which would typically handle the balance of plant for reactor systems. In achieving this we sought to enable user-specified separation of the RETRAN code portion from the MINET code portion, i.e., to give the user freedom in locating interfaces. This had the added effect of forcing the separation of the two codes (except at the interface) and enables easy integration of new versions of either RETRAN or MINET into the RETRAN-MINET combined code.

3.1 Modularity of the Interface

It was not desirable to make any major structural changes to either RETRAN or MINET in constructing the interface to the codes. Such an approach would be a very risky undertaking, and would likely lead to a loss of confidence by the users of the RETRAN/MINET Composite Code. In addition, any major structural changes would make it difficult to update either the RETRAN portion or the MINET portion if the stand-alone versions of either code was improved at some future date. Consequently, a modular approach was taken in combining the codes.

In the modular approach, RETRAN was chosen as the driver module for the RETRAN-MINET code. RETRAN determines whether the steady state calculation will be performed and sets the time step for MINET to follow during the transient calculation. MINET is called to advance to the next time (determined by RETRAN), and then RETRAN advances to that time.

The structure of the RETRAN/MINET is indicated in Figure 3-1. Note that only three RETRAN subroutines are directly impacted, i.e., RMAIN, STSTAT, and TRAN. The revised calculational processes in subroutines STSTAT and TRAN are indicated in Figures 3-2 and 3-3, respectively. None of the MINET subroutines were altered, although the main program ("MINET") was effectively displaced in the calculational procedure. Other than the nine new subprograms (either subroutines or functions) only three, STLINK, FILLM, and TDV are of significant length and complexity. The calculational process in subroutine STLINK is charted in Figure 3-4. All nine are described briefly below:

Subroutine STLINK

This subroutine performs the steady state and transient links between RETRAN and MINET. If the user specifies that RETRAN node A is to be connected to node X in MINET, the information exchange is performed by this procedure. Extensive debug capability has been incorporated into this procedure and may be activated by assigning the variable IPRT a value greater than the default (no debug) zero value.

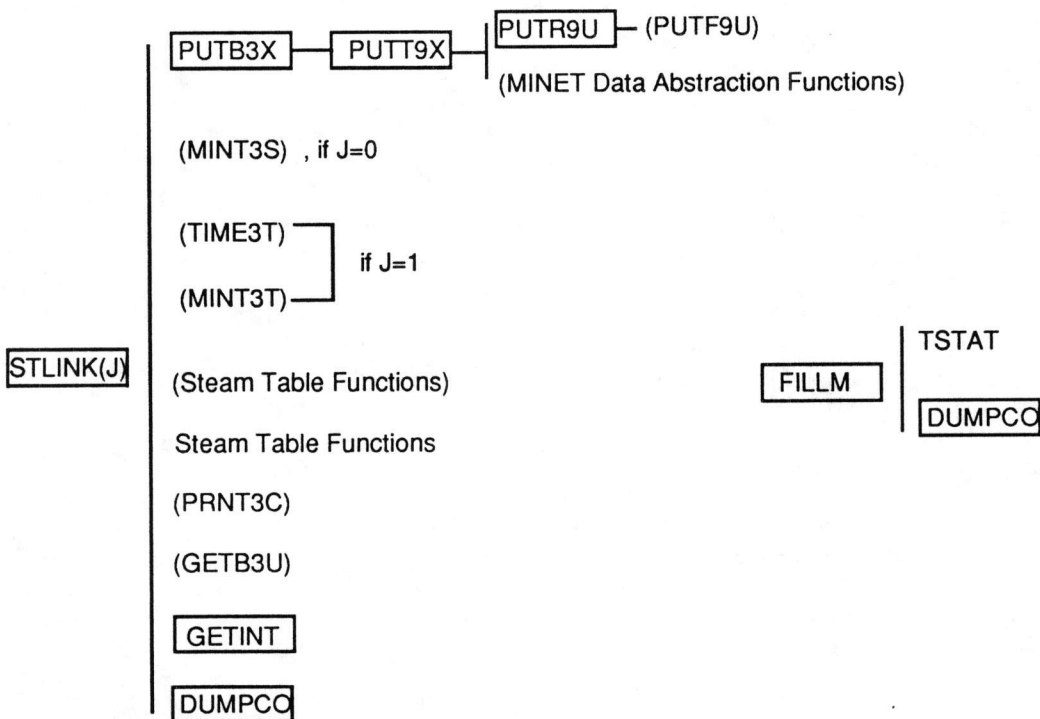
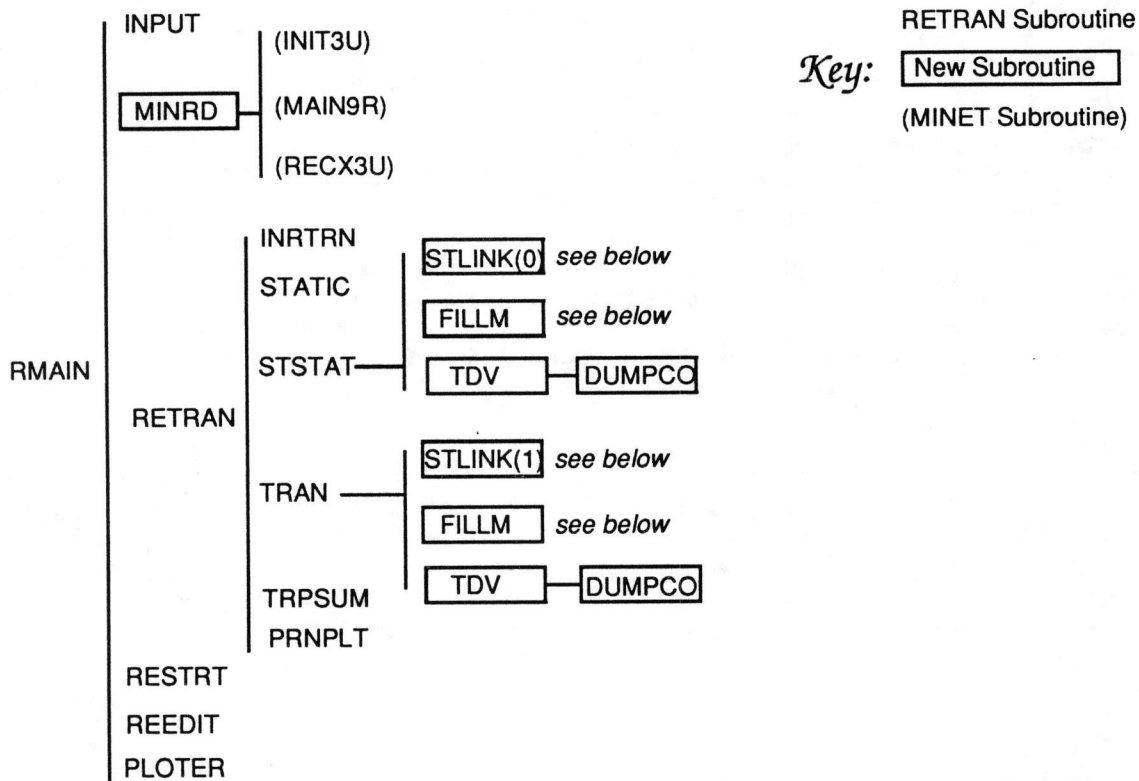


Figure 3-1. Structure of RETRAN/MINET Composite Code

Figure 3-2. Calculational Process in Subroutine STSTAT

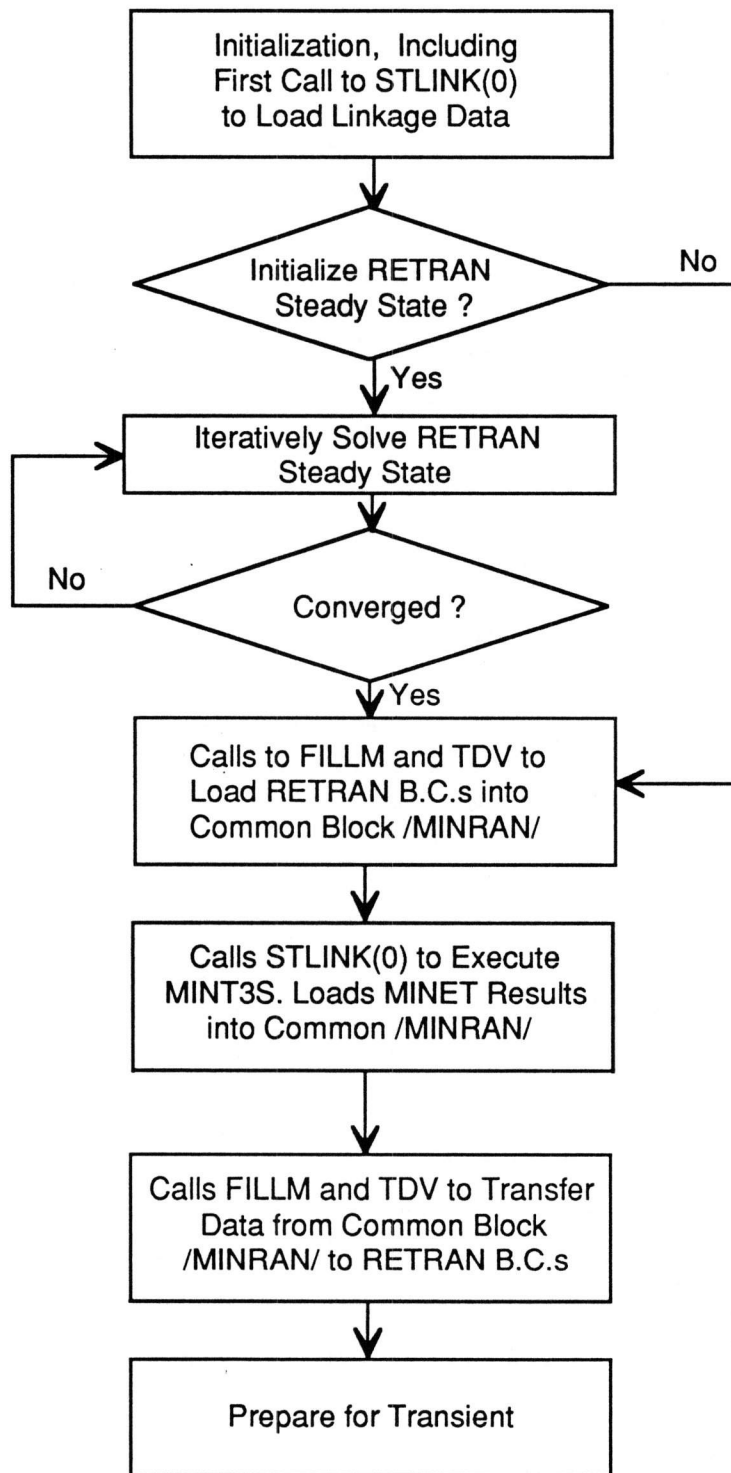


Figure 3-3. Calculational Process in Subroutine TRAN

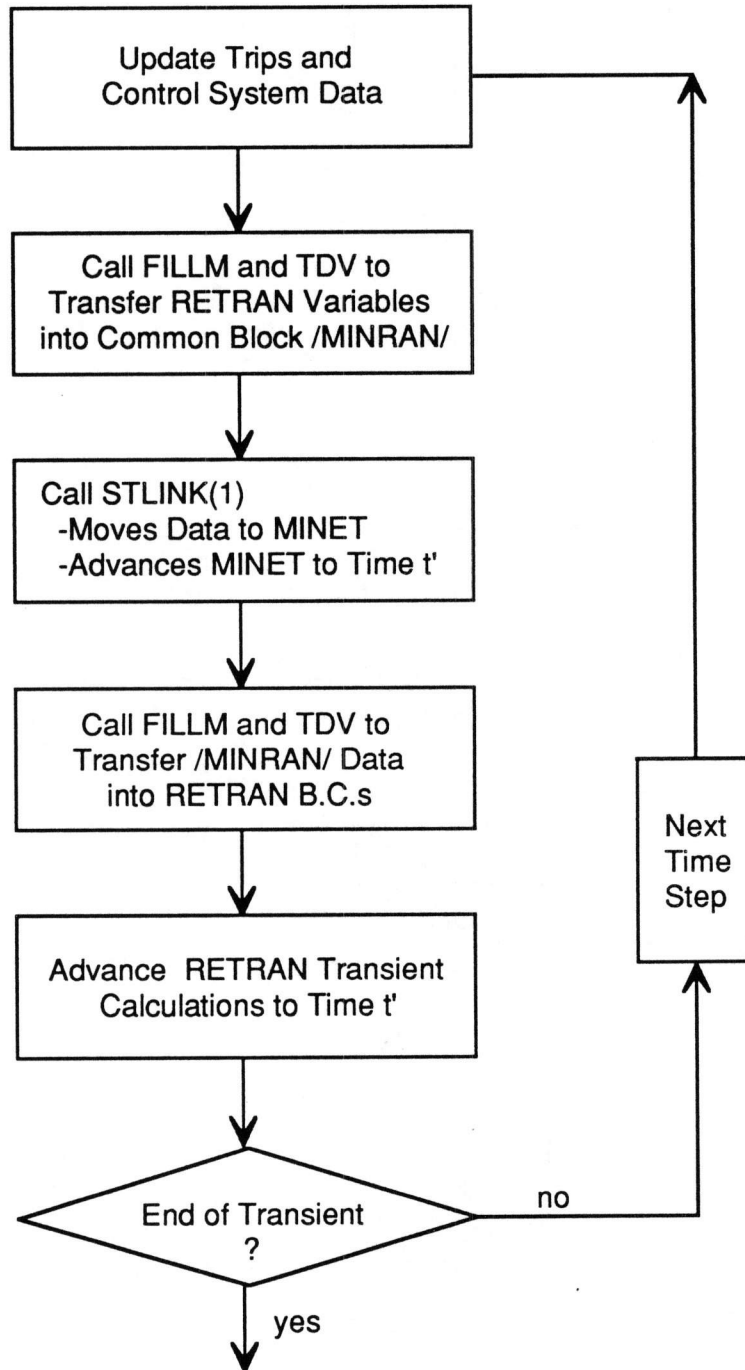
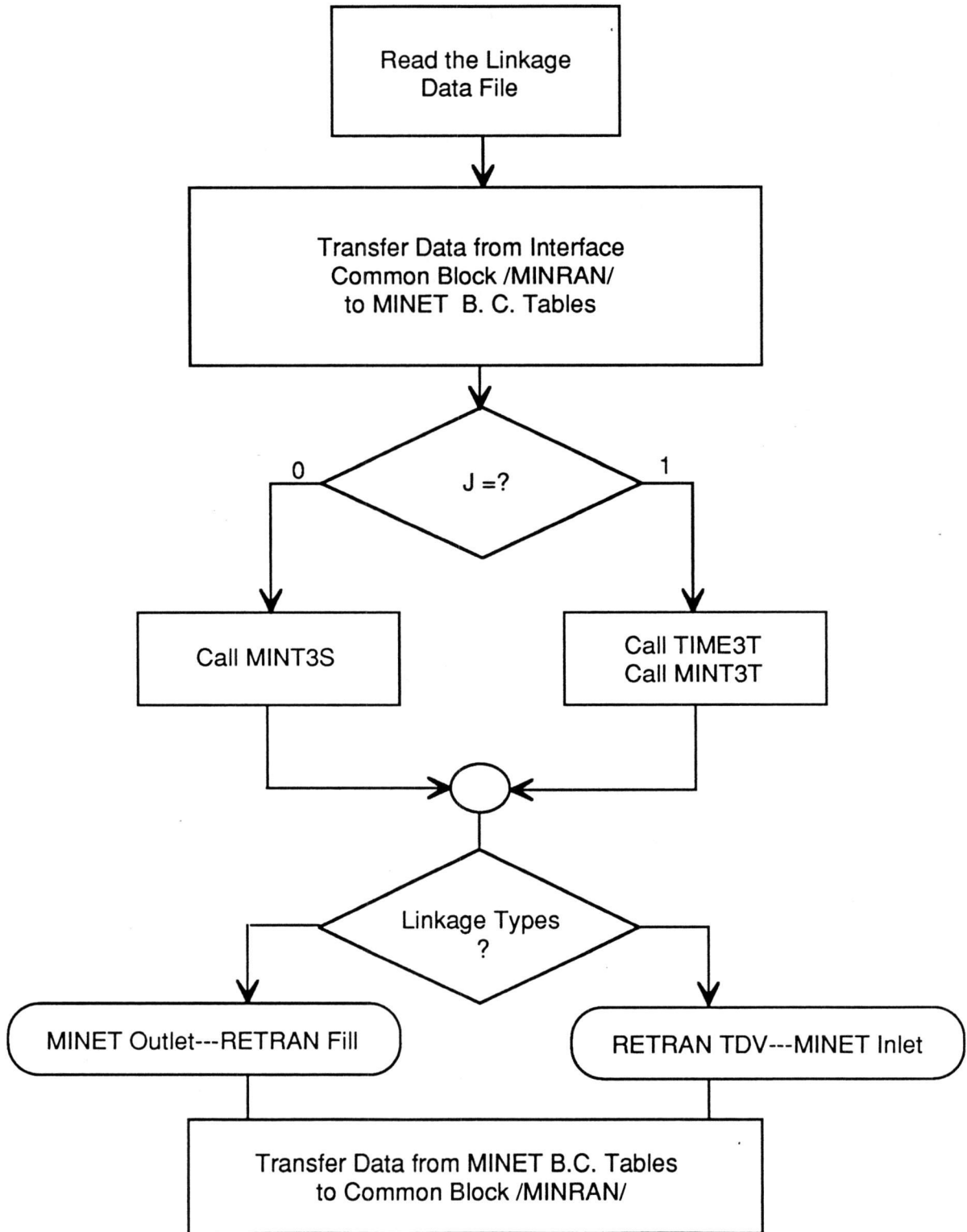


Figure 3-4. Calculational Process in Subroutine STLINK



Subroutine FILLM

This subroutine overwrites (when specified) the information stored in FILID(06) and FILID(14). The normal user input for a FILL boundary condition is stored in these files. When a user specifies a link from RETRAN to MINET, appropriate variables in these files are over-written by FILLM. The coding structure of subroutine FILLM is similar to the coding structure of RETRAN Function FILL.

Subroutine FILLM (Fill with MINET Data) is called with a junction index as well as a flag that is a Get or Set flag. When the Get flag is on, this routine loads the common block MINRAN with data obtained from RETRAN junction file FILID(06), for eventual transfer to MINET. When the Set flag is on, the user input FILL tables (FILID(14)) are overwritten by MINET data, so that the next time RETRAN wants to look at user input fill tables, RETRAN will see MINET data. Also FILID(06) (junction data) is updated to contain the latest MINET values.

Subroutine TDV

This subroutine overwrites (when specified) the information stored in FILID(05) and FILID(33). The normal user input for a TDV boundary condition are stored in these files. When a user specifies a link RETRAN to MINET, appropriate variables in these files are over-written by TDV. The coding structure of subroutine TDV is similar to the coding structure of RETRAN subroutine CARDBC.

Subroutine TDV (with MINET data) is called with only a Get or Set flag. When the Get flag is on, this routine loads the common block MINRAN with data obtained from RETRAN volume file FILID(05), for eventual transfer to MINET. When the Set flag is on, the user input TDV tables (FILID(33)) are overwritten by MINET data, so that the next time RETRAN wants to look at user input TDV tables, RETRAN will see MINET data. Also FILID(06) (volume data) is updated to contain the latest MINET values.

Subroutine MINRD

Calls INIT3U to initialize MINET input and output devices, calls MAIN9R to process the MINET input data, and if restarting, call RECX3U to restore the MINET data arrays.

Subroutine GETINT

Called after MINET steady state or transient calculation, it retrieves flow and enthalpy at the MINET outlet boundary module linked to the specified RETRAN fill boundary.

Subroutine DUMPCO

Prints out the contents of the MINRAN Common Block, which contains all data associated with each RETRAN/MINET interface location (up to 10 currently allowed).

Function PUTB3X

Searches through MINET boundary modules looking to match ID numbers with value from RETRAN. Once matched, calls PUTT9X to load enthalpy, pressure, or flow in transient boundary tables.

Function PUTT9X

Called from PUTB3X with item number and X and Y values, it calls PUTR9U to load values in MINET boundary tables.

Function PUTR9U

Called from PUTT9X, it calls PUTF9U (a MINET function) to load new values in boundary tables.

3.2 Interface Coupling Boundaries and Associated Data

Two types of RETRAN boundary nodes were chosen to make the interfacial links to the MINET code.

- a. FILL - RETRAN Time Dependent Fill B.C. (flow into RETRAN)
- b. TDV - RETRAN Time Dependent Volume B.C. (flow out of RETRAN)

At each of the boundary types, either FILL or TDV, flow reversal is permitted.

Normally, the RETRAN User inputs some time dependent tables at these nodes to specify the boundaries of the RETRAN problem. Similarly, the MINET User would input some time dependent tables to specify the boundaries of the MINET problem. In the coupled RETRAN-MINET code, these former boundaries to the stand-alone RETRAN code and the stand-alone MINET code become the transfer nodes for RETRAN and MINET to exchange information (e.g., thermodynamic state variables that the separate RETRAN and MINET codes need to perform their respective parts of the combined calculation), as indicated in Figure 3-5. The additional data required to define the interfaces are shown in Figure 3.6.

Immediately prior to the calls to MINET all common boundary data needed by MINET is sent from RETRAN. Immediately after the return from MINET, the RETRAN boundary values are updated by new values from MINET. In the case of the RETRAN Time Dependent Volume B.C., the RETRAN volume files (FILID(33) and FILID(06)) are changed to contain the last values calculated from MINET. In the case of the RETRAN Fill B.C. the RETRAN junction files FILID(14) and FILID(06) are changed to contain the last calculated MINET values.

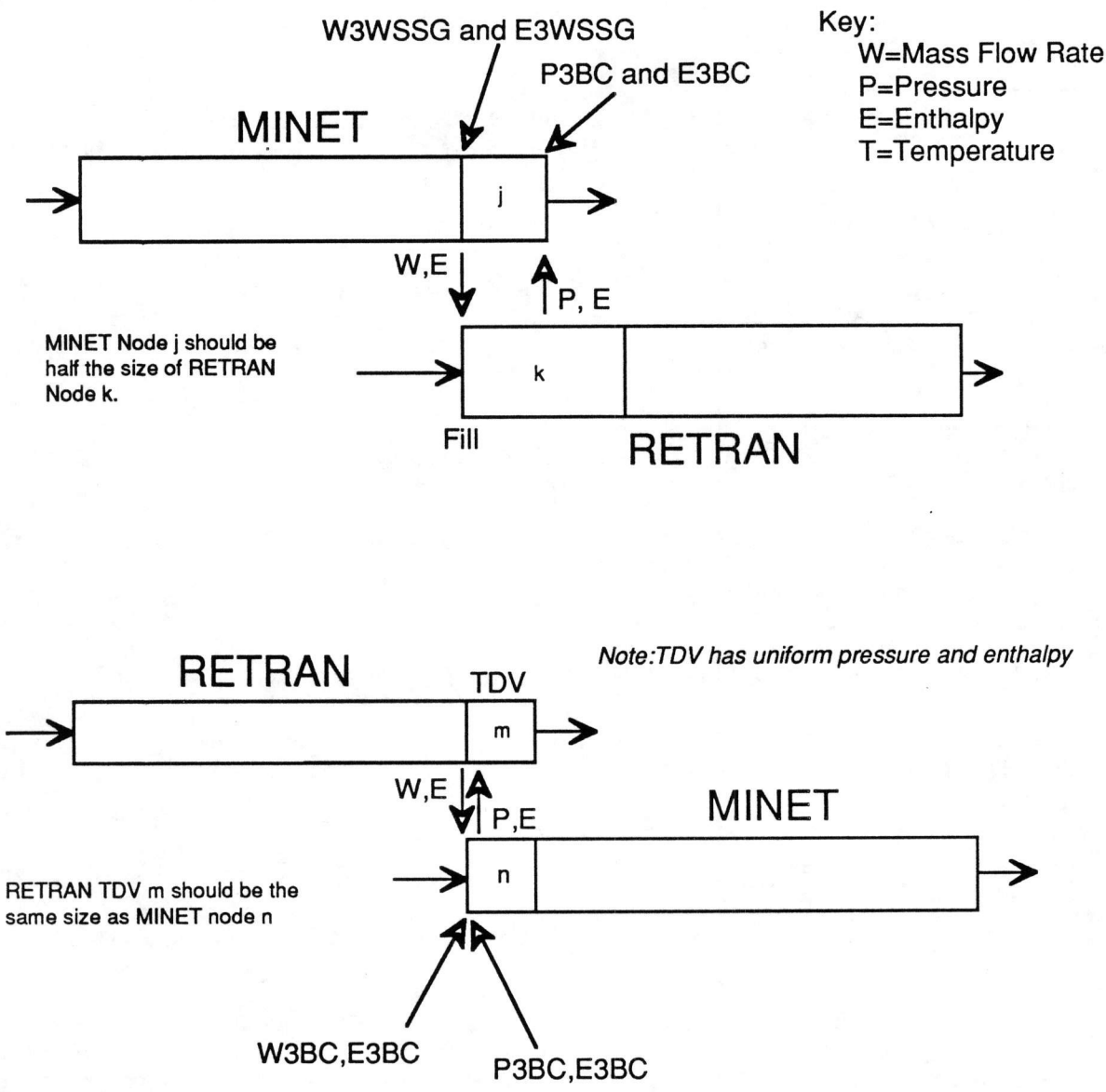


Figure 3-5. Key Variables at Boundaries

3.3 Preparation of Input Data

All user input is processed by the RETRAN and MINET input processors. The user prepares a separate input deck for RETRAN and a separate input deck for MINET that covers their respective parts of the calculation as if both codes were operating as stand-alone modules. This means that time dependent boundary input tables must be provided for both codes, even though this data will not be used at the interface between RETRAN and MINET. Each of these tables must have two or more time entries. The data in these tables can be any dummy data that will get through the error checking routines in the respective input processors of RETRAN and MINET.

The LINK data block has been added to MINET input file to facilitate the construction of a sufficient general means of importing/exporting boundary and/or control information between MINET and a set of prospective host codes. At the present time, RETRAN is the only code for which a detailed interface has been completed.

The general form and syntax of records in the LINK input file follows that described for MINET records in the MINET User's Manual. The LINK record-block may either precede or follow the main MINET input. The LINK file-record:

ØV LINK

introduces the LINK data and must be the first record in the block. The second record may be any valid LINK data record (it may not be a comment). Subsequent data records may be arranged in any order. A comment field may not be imbedded within a data string but may be appended to any record or entered as a separate record. The first character in a comment field must be a slash "/". The

STOP

record terminates the processing of input from a given device.

A brief description of the LINK data file can be found in Figure 3-7, and an example input file is shown in Figure 3-8. A more detailed listing will appear in the MINET User's Manual. It is noted that all data records indicated in Figure 3-7 are optional, i.e., the absence of all records simply defaults to no linkages.

Usage of the input decks, as well as reassignment of MINNET input/output device numbers are indicated in Figure 3-9. Key assumptions regarding data within the RETRAN and MINET input decks are listed in Figure 5-10.

3.4 A Note About Units

RETRAN used the English system of units, while MINET uses either the metric system or the English system for input and print-out. Generally, the user should choose the English units input/output option when running the Composite Code. In the rare case that SI units are to be utilized, the user is advised to use exact conversions (9 digit) for the geometry at nodes that connect the two codes.

Figure 3-6 Definition of Interface Variables

The MINRAN data block contains the variables that link the RETRAN and MINET Codes. The definitions of the variables is shown below:

LNKMAX = Maximum Number of Link Input Cards Between MINET and RETRAN
If (LNKMAX.EQ.0) only RETRAN is executed.

LNK(I) = Type of Link (1=TDV) (2=FILL) (3=Both) (Other=No Link)
Any except (1,2,3) de-couples the RETRAN-MINET calculations at the node(s) and runs both codes independently at the link nodes using the user specified input boundary conditions. If all LNK(I) are not (1,2,3), then both codes operate as stand-alone modules.
If LNK(I) is negative, only RETRAN executes, but a dummy MINET Input deck is still required.

NTD(I) = RETRAN Input Volume Number (Integer)
MTD(I) = MINET Input Volume Number (Integer)
NFIL(I) = RETRAN Input Junction Number (Integer)
MFIL(I) = MINET Input Junction Number (Integer)

Get TDV Parameters (from RETRAN)

WPM = RETRAN Junction Weight Flow To Put In MINET (Psia.)
HPM = RETRAN Junction Enthalpy To Put In MINET (Btu/lbm)
PJUNM = RETRAN Junction Pressure To Put In MINET (Psia.)

Set TDV Parameters (to RETRAN)

PTABLM = MINET Pressure To Put In RETRAN TDV (Psia.)
TTABLM = MINET Temperature To Put In RETRAN TDV (deg F.)
XTABLM = MINET Quality To Put In RETRAN TDV (quality)
ZTABLM = MINET Level To Put In RETRAN TDV (Ft.)
(Does not exist in MINET)
ZVOLM = RETRAN MAX. Level To Put In RETRAN TDV (Ft.)
(Replacement for ZTABLM)

GET FILL Parameters (from RETRAN)

PM = RETRAN Volume Pressure To Put In MINET (Psia.)
HWM = RETRAN Volume Specific Enthalpy To Put In MINET (Btu/lbm)
ZMM = RETRAN Volume Mixture Level To Put In MINET (Ft.)
AVEXM = RETRAN Volume Average Quality To Put In MINET (Quality)

SET FILL Parameters (to RETRAN)

FILTBM = MINET FILL Junction Flow/Area To Put In RETRAN (Lbm/sec/Ft/
FILENM = MINET FILL Junction Enthalpy To Put In RETRAN (Btu/Lbm
FILPRM = MINET FILL Junction Pressure To Put In RETRAN (Psia.

AJUNTM = RETRAN FILL Junction Area = A To Make Flow/A (Ft.**2)

TIMNEM = Problem Transient Time (from RETRAN) (Sec.)
TIMOLM = Previous Transient Time (from RETRAN) (Sec.)
DELTM = TIME-TIMOLM (from RETRAN) (Sec.)
ISTRT = Debug Print Counter (from RETRAN)

Figure 3-7

LINK Data File for RETRAN/MINET Composite Code

ØV LINK

10000D Boundary interface record

REC_ID -User assigned unique record identifier
LNK -Link type
1 - TDV
2 - Fill
3 - Both TDV and Fill
Other - No link

Any value, except 1, 2 or 3, de-couples the calculation at the node(s) and runs both codes independently at the link node.

NTD -RETRAN input volume number
MTD -MINET input volume number
NFILL -RETRAN input junction number
MFILL -MINET input junction number

10001D MINET segment to RETRAN function generator link

REC_ID -User assigned unique record identifier
MINET_ID -Id of MINET segment module
SEG_PARM -Segment Parameter type
1 - Node average enthalpy
2 - Node average temperature
3 - Node average Density
SEG_NODE -Segment node
FNG_NUM -RETRAN function generator number

10101D MINET valve to RETRAN function generator link

REDID -USER assigned unique record number
MINET_ID -MINET valve id
VALV_PARM -Valve parameter type
1 - Valve position
2 - Choking Mass Flow Rate
3 - Valve demand position
FNG_NUM -RETRAN function generator number

10201D MINET pump to RETRAN function generator link

REC_ID -User assigned unique record number
MINET_ID -MINET pump id
PUMP_PARM -Pump parameter type
1 - Relative pump speed
2 - Pump demand speed
3 - Pump speed
4 - Mass flow rate
5 - Pump head
FNG_NUM -RETRAN function generator number

Figure 3-7 (cont.)

LINK Data File for RETRAN/MINET Composite Code (cont.)

10401D MINET boundary to RETRAN function generator link
REC ID -User assigned unique record identifier
MINET ID -MINET Boundary module id
BND_PFM -Boundary Parameter type
1 - Boundary enthalpy
2 - Boundary pressure
3 - Boundary mass flow rate
4 - Boundary temperature
5 - Boundary quality
FNG_NUM -RETRAN function generator number

10501D MINET volume to RETRAN function generator link
REC ID -USER assigned unique record number
MINET ID -MINET volume id
VOLM_PFM -Volume parameter type
1 - Volume average enthalpy
2 - Volume average pressure
3 - Volume Temperature
4 - Volume average density
5 - Relative liquid level
FNG_NUM -RETRAN function generator number

10601D MINET turbine to RETRAN function generator link
REC ID -User assigned unique record number
MINET ID -MINET turbine id
PUMP_PFM -Turbine parameter type
1 - Turbine speed
2 - Turbine operating efficiency
3 - Power from generator
4 - Turbine demand speed
FNG_NUM -RETRAN function generator number

10901D MINET junction to RETRAN function generator link
REC ID -User assigned unique record identifier
MINET ID -MINET junction module id
JNCT_PFM -Junction Parameter type
1 - Enthalpy at nodal interface
2 - Mass flow rate at nodal interface
3 - Temperature at nodal interface
FNG_NUM -RETRAN function generator number

Figure 3-7 (cont.)

LINK Data File for RETRAN/MINET Composite Code (cont.)

13011D RETRAN controller to MINET pipe heat table link
REC ID -USER assigned unique record number
MINET_ID -MINET pipe heat table id
CNTLR_NO -RETRAN controller number

13111D RETRAN controller to MINET valve heat table link
REC ID -USER assigned unique record number
MINET_ID -MINET valve heat table id
CNTLR_NO -RETRAN controller number

13121D RETRAN controller to MINET valve position table link
REC ID -USER assigned unique record number
MINET_ID -MINET valve position table id
CNTLR_NO -RETRAN controller number

13211D RETRAN controller to MINET pump heat table link
REC ID -USER assigned unique record number
MINET_ID -MINET pump heat table id
CNTLR_NO -RETRAN controller number

13221D RETRAN controller to MINET pump speed table link
REC ID -USER assigned unique record number
MINET_ID -MINET pump speed table id
CNTLR_NO -RETRAN controller number

13411D RETRAN controller to MINET boundary table link
REC ID -USER assigned unique record number
MINET_ID -MINET valve heat table id
CNTLR_NO -RETRAN controller number
BND_PRM -Boundary parameter type
1 - Boundary enthalpy
2 - Boundary pressure
3 - Boundary mass flow rate

13511D RETRAN controller to MINET volume heat table link
REC ID -USER assigned unique record number
MINET_ID -MINET volume heat table id
CNTLR_NO -RETRAN controller number

13611D RETRAN controller to MINET turbine speed table link
REC ID -USER assigned unique record number
MINET_ID -MINET turbine speed table id
CNTLR_NO -RETRAN controller number

NOTE: Further description is provided in the MINET User's Manual

MINET ROBINSON DECK, DEVELOPED FOR RET/MINET CONTROL SYSTEM

OV MINETB

1D 1,1,2,0.328,2.844,1.5E-5,1,1/
 1D 2,1,2,89.281,2.352,1.5E-5,2,1/
 1D 3,1,2,72.671,2.060,1.5E-5,2,1/
 1D 4,1,2,165.778,1.7979,1.5E-5,3,1/
 1D 5,1,2,127.625,2.159,1.5E-5,2,1/
 1D 6,1,2,94.816,2.100,1.5E-5,2,1/
 1D 7,1,2,66.010,2.139,1.5E-5,2,1/
 1D 8,1,2,115.029,1.749,1.5E-5,2,1/
 1D 9,1,2,0.328,1.106,1.5E-5,1,1/
 1D 10,1,2,93.625,2.235,1.5E-5,2,1/
 1D 11,1,2,50.0,1.453,1.5E-5,2,2/
 1D 12,1,2,48.025,2.054,1.5E-5,2,1/
 1D 13,1,2,70.0,2.70,1.5E-5,2,1/
 1D 14,1,2,35.436,1.453,1.5E-5,1,1/
 1D 15,1,2,266.296,1.153,1.5E-5,3,1/
 1D 16,1,2,286.109,1.153,1.5E-5,3,1/
 1D 17,1,2,0.328,1.153,1.5E-5,1,1/
 1D 18,1,2,181.083,1.153,1.5E-5,3,2/
 1D 19,1,2,140.167,1.153,1.5E-5,3,2/
 1D 20,1,2,0.328,1.153,1.5E-5,1,2/
 1D 31,1,2,286.109,1.153,1.5E-5,3,1/
 1D 32,1,2,0.328,1.153,1.5E-5,1,1/
 1D 33,1,2,140.167,1.153,1.5E-5,3,2/
 1D 34,1,2,0.328,1.153,1.5E-5,1,2/
 101D 501,1,2,3.937,1.106,1.5E-5,1,1,0.958,1.0E-5,1.5/
 101D 502,1,2,3.937,1.453,1.5E-5,1,2,1.657,1.0E-5,1.5/
 101D 503,1,2,3.937,1.158,1.5E-5,1,1,1.055,1.0E-5,1.5/
 101D 504,1,2,3.937,1.158,1.5E-5,1,1,1.055,1.0E-5,1.5/
 101D 505,1,2,3.937,0.955,1.5E-5,1,1,0.721,1.0E-5,1.5/
 101D 506,1,2,3.937,1.158,1.5E-5,1,2,1.055,1.0E-5,1.5/
 101D 507,1,2,3.937,1.158,1.5E-5,1,2,1.055,1.0E-5,1.5/
 101D 508,1,2,3.937,0.955,1.5E-5,1,2,0.721,1.0E-5,1.5/
 101D 531,1,2,3.937,0.955,1.5E-5,1,1,0.721,1.0E-5,1.5/
 101D 532,1,2,3.937,0.955,1.5E-5,1,2,0.721,1.0E-5,1.5/
 201D 201,1,2,11.493,1.270,1.5E-6,1,2/
 201D 202,1,2,10.453,1.814,1.5E-6,1,2/
 401D 401,1/
 402D 402,1/
 401D 403,1/
 402D 404,1/
 402D 432,1/
 402D 434,1/
 501D 101,1,14.267,3.281,0.0,1.0,1.641,1,1/
 501D 102,1,78.681,17.487,0.0,1.0,10.367,1,1/
 501D 103,1,12.925,3.281,0.0,1.0,12.008,1,1/
 501D 104,1,5.438,3.281,0.0,1.0,13.648,2,1/
 501D 105,1,10.877,3.281,0.0,1.0,15.289,1,1/
 501D 106,1,10.877,3.281,0.0,1.0,16.929,1,1/
 501D 107,1,3.461,3.281,0.0,1.0,18.57,1,1/
 501D 108,1,3.461,3.281,0.0,1.0,20.21,1,1/
 501D 109,1,3.461,3.281,0.0,1.0,18.57,2,1/
 501D 110,1,3.461,3.281,0.0,1.0,20.21,2,1/
 511D 101,1/
 512D 101,2/
 511D 102,1/
 511D 102,3/
 512D 102,2/
 511D 103,1/

Figure 3-8 (Cont'd)

512D 103,2/
511D 104,1/
512D 104,2/
511D 105,1/
512D 105,2/
511D 106,1/
512D 106,2/
512D 106,3/
511D 107,1/
512D 107,2/
511D 108,1/
512D 108,2/
512D 108,3/
511D 109,1/
512D 109,2/
511D 110,1/
512D 110,2/
512D 110,3/
801D 401,1/
801D 403,1/
901D 0.0,401,1,1,1/
901D 0.0,1,2,201,1/
901D 0.0,201,2,101,1/
901D 1.64,101,2,2,1/
901D 1.64,2,2,3,1/
901D 1.64,3,2,4,1/
901D 1.64,4,2,5,1/
901D 1.64,5,2,6,1/
901D 1.64,6,2,7,1/
901D 1.64,7,2,8,1/
901D 1.64,8,2,102,1/
901D 1.64,403,1,9,1/
901D 1.64,9,2,501,1/
901D 1.64,501,2,102,3/
901D 10.367,102,2,10,1/
901D 12.008,10,2,103,1/
901D 12.008,103,2,202,1/
901D 12.008,202,2,104,1/
901D 13.648,104,2,11,1/
901D 13.648,11,2,502,1/
901D 13.648,502,2,105,1/
901D 15.289,105,2,12,1/
901D 15.289,12,2,13,1/
901D 15.289,13,2,14,1/
901D 15.289,14,2,106,1/
901D 16.929,106,2,503,1/
901D 16.929,503,2,107,1/
901D 18.57,107,2,15,1/
901D 18.57,15,2,504,1/
901D 18.57,504,2,108,1/
901D 20.21,108,2,16,1/
901D 20.21,16,2,505,1/
901D 20.21,505,2,17,1/
901D 20.21,17,2,402,1/
901D 20.21,108,3,31,1/
901D 20.21,31,2,531,1/
901D 20.21,531,2,32,1/
901D 20.21,32,2,432,1/
901D 16.929,106,3,506,1/
901D 16.929,506,2,109,1/

Figure 3-8 (Cont'd)

901D 18.57,109,2,18,1/
 901D 18.57,18,2,507,1/
 901D 18.57,507,2,110,1/
 901D 20.21,110,2,19,1/
 901D 20.21,19,2,508,1/
 901D 20.21,508,2,20,1/
 901D 20.21,20,2,404,1/
 901D 20.21,110,3,33,1/
 901D 20.21,33,2,532,1/
 901D 20.21,532,2,34,1/
 901D 20.21,34,2,434,1/
 1001D 2,14.524/
 1001D 3,14.72/
 1001D 4,11.0/
 1001D 5,0.0/
 1001D 6,11.48/
 1001D 7,11.20/
 1001D 8,9.12/
 1001D 14,5.144/
 / 1101D 501,0.0,1.0,0,-999,725.163,10.0,14.603,15.0/
 1101D 501,0.0,1.0,0,-999,250.0,10.0,14.603,15.0/
 1101D 502,0.0,1.0,0,0,420.0,0.2,280.0,0.3/
 1101D 503,46.19,1.0,0,-999,725.163,10.0,14.603,15.0/
 1101D 504,1.074,1.0,0,0,280.0,0.2,186.0,0.3/
 1101D 505,3.3,1.0,0,-999,725.163,10.0,14.603,15.0/
 1101D 506,47.138,1.0,0,-999,725.163,10.0,14.603,15.0/
 1101D 507,1.074,1.0,0,0,280.0,0.2,186.0,0.3/
 1101D 508,3.3,1.0,0,-999,725.163,10.0,14.603,15.0/
 1101D 531,3.3,1.0,1,-999,910.0,10.0,91.0,15.0/
 1101D 532,3.3,1.0,1,-999,910.0,10.0,91.0,15.0/
 1201D 201,0.0,1335.031,1130.0,1170.0,1.5073,-0.6968,
 0.0009,0.6332,-0.4382,5.0,20.0/
 1201D 202,0.0,1552.153,1665.0,3570.0,1.2772,-0.6397,
 1.2513,-1.1053,0.2167,5.0,20.0/
 2001D 2,464.904E6/
 2001D 3,247.974E6/
 2001D 5,392.226E6/
 2001D 6,405.086E6/
 2001D 7,491.314E6/
 2001D 13,762.204E6/
 2101D 501,0.0,1.0/
 2101D 502,0.0,1.0/
 2101D 503,0.0,1.0/
 2101D 504,0.0,1.0/
 2101D 505,0.0,1.0/
 2101D 506,0.0,1.0/
 2101D 507,0.0,1.0/
 2101D 508,0.0,1.0/
 2101D 531,0.0,1.0E-5/
 2101D 532,0.0,1.0E-5/
 2201D 201,0.0,1170.0/
 2201D 202,0.0,3570.0/
 2401D 401,2,1,70.036,2022.337,1.5/
 2401D 403,0,1,354.391,783.223,387.237/
 2401D 402,1,1,421.989,935.185,830.558/
 2401D 404,1,1,421.989,1870.37,830.558/
 2401D 432,1,1,421.989,0.001,830.558/
 2401D 434,1,1,421.989,0.001,830.558/
 2501D 101,0.0,0.0,538.216/
 2501D,102,0.0,0.0,387.237/

Figure 3-8 (Cont'd)

2501D 103,0.0,0.0,387.237/
 2501D 104,0.0,0.0,722.988/
 2501D 105,0.0,0.0,1053.373/
 2501D 106,0.0,0.0,1031.4721/
 2501D 107,0.0,0.0,836.258/
 2501D 108,0.0,0.0,821.32/
 2501D 109,0.0,0.0,836.258/
 2501D 110,0.0,0.0,821.32/
 2511D 101,2,2022.337/
 2511D,102,2,2805.6025/
 2511D 103,2,2805.6025/
 2511D,104,2,2805.6025/
 2511D,105,2,2805.6025/
 2511D,106,2,935.185/
 2511D 107,2,935.185/
 2511D,108,2,935.185/
 2511D 108,3,0.001/
 2511D,106,3,1870.37/
 2511D,109,2,1870.37/
 2511D 110,2,1870.37/
 2511D 110,3,0.001/
 / 3011D 2, 0.0,464.904E6, 120.0,464.904E6, 125.0,0.0, 999.0,0.0/
 / 3011D 3, 0.0,247.974E6, 120.0,247.974E6, 125.0,0.0, 999.0,0.0/
 / 3011D 5, 0.0,392.226E6, 120.0,392.226E6, 125.0,0.0, 999.0,0.0/
 / 3011D 6, 0.0,405.086E6, 120.0,405.086E6, 125.0,0.0, 999.0,0.0/
 / 3011D 7, 0.0,491.314E6, 120.0,491.314E6, 125.0,0.0, 999.0,0.0/
 / 3011D 13, 0.0,762.204E6, 120.0,762.204E6, 125.0,0.0, 999.0,0.0/
 / 3011D 2, 0.0,464.904E6, 999.0,464.904E6/
 / 3011D 3, 0.0,247.974E6, 999.0,247.974E6/
 / 3011D 5, 0.0,392.226E6, 999.0,392.226E6/
 / 3011D 6, 0.0,405.086E6, 999.0,405.086E6/
 / 3011D 7, 0.0,491.314E6, 999.0,491.314E6/
 / 3011D 13, 0.0,762.204E6, 999.0,762.204E6/
 3011D 2, 0.0,1.0, 999.0,1.0/
 3011D 3, 0.0,1.0, 999.0,1.0/
 3011D 5, 0.0,1.0, 999.0,1.0/
 3011D 6, 0.0,1.0, 999.0,1.0/
 3011D 7, 0.0,1.0, 999.0,1.0/
 3011D 13, 0.0,1.0, 999.0,1.0/
 3121D 501, 0.0,1.0, 999.0,1.0/
 / 3121D 501, 0.0,1.0, 20.0,1.0, 25.0,0.0, 999.0,0.0/
 / 3121D 502,0.0,1.0,999.0,0.0,1.0/
 3121D 503,0.0,1.0,999.0,1.0/
 / 3121D 504,0.0,1.0,999.0,1.0/
 3121D 505,0.0,1.0,999.0,1.0/
 3121D 506,0.0,1.0,999.0,1.0/
 / 3121D 507,0.0,1.0,999.0,1.0/
 3121D 508,0.0,1.0,999.0,1.0/
 3121D 531,0.0,1.0E-5,999.0,1.0E-5/
 3121D 532,0.0,1.0E-5,999.0,1.0E-5/
 3201D 201,9999.9/
 3201D 202,9999.9/
 3221D 201,0.0,1170.0,999.0,1170.0/
 3221D 202,0.0,3570.0,999.0,3570.0/
 3411D 401,2,1,0.0, 70.036, 7.8314,999.0, 70.036,7.8314/
 / 3411D 403,1,1,0.0,354.391,783.223, 999.0,354.391,783.223/
 3411D 403,2,1,0.0,354.391,437.1597,999.0,354.391,437.1597/
 3411D 402,2,1,0.0,421.989,830.558,999.0,421.989,830.558/
 3411D 404,2,1,0.0,421.989,830.558,999.0,421.989,830.558/
 3411D 432,2,1,0.0,421.989,830.558,999.0,421.989,830.558/

Figure 3-8 (Cont'd)

```
3411D 434,2,1,0.0,421.989,830.558,999.0,421.989,830.558/
4000D 30.00/
4100D 99999,3,1.0,999.0/
4200D 0,1 /
4300D 1 /
OV LINK
10000D 1 2 0 0 800 404
10000D 2 2 0 0 700 402
10000D 3 2 0 0 190 432
10000D 4 2 0 0 290 434
/* LNK NTD MTD NFIL MFIL
/ (LNK DATA 1=TDV,2=FILL,3=BOTH,0=DECOUPLED)
13121D 5 508 -30 / valve
13121D 6 505 -28 / valve
13221D 7 201 -32 / pump
13221D 8 202 -33 / pump
/
10901D 9 504 2 -34 / mass flow - single
10901D 10 507 2 -35 / mass flow - double
/
13121D 11 501 -36 / valve 501
13011D 12 2 -37 /heater 1
13011D 13 3 -38 /heater 2
13011D 14 5 -39 /heater 3
13011D 15 6 -40 /heater 4
13011D 16 7 -41 /heater 5
13011D 17 13 -42 /heater 6
STOP
END
```

Figure 3-9. RETRAN/MINET Composite Code Configuration and I/O Device Utilization

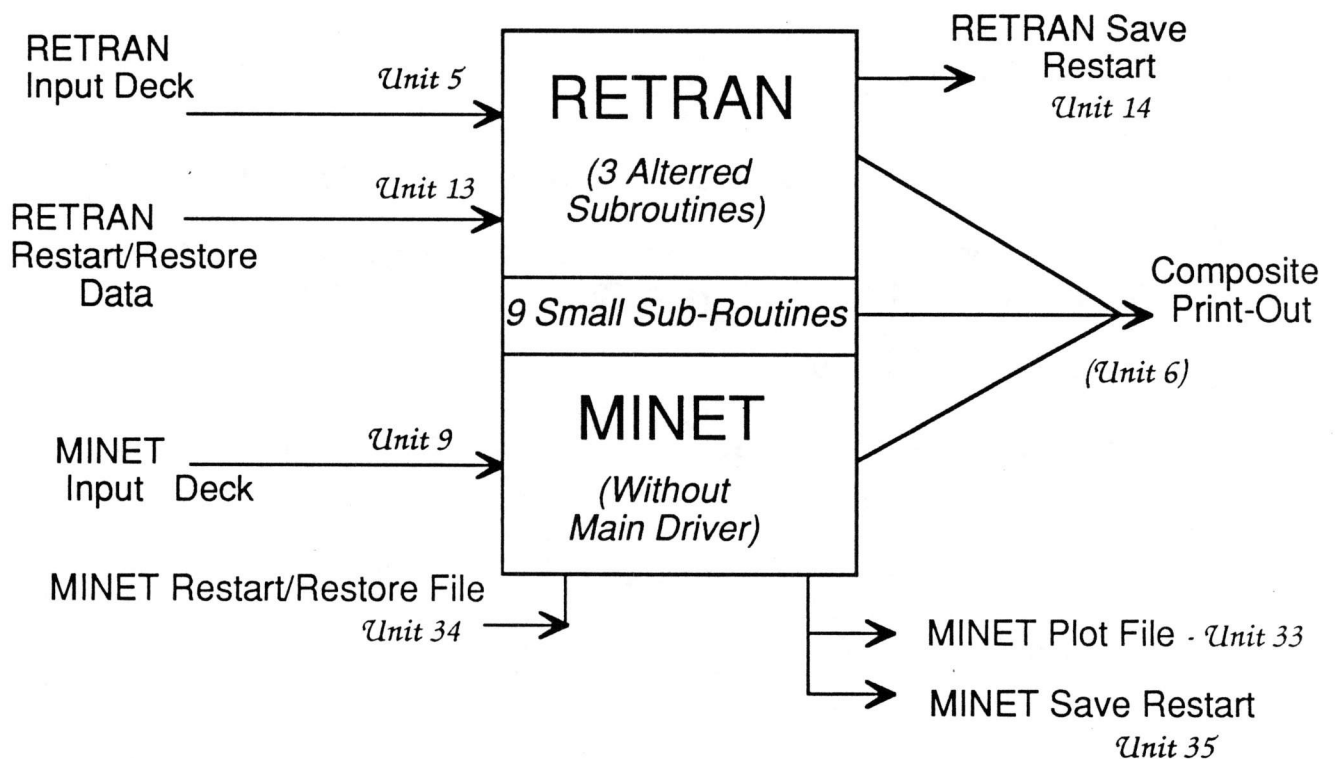


Figure 3-10. Input Deck Restrictions

RETRAN

- At the Interface Locations, Cells Should Be Sized Consistant with Fig 4-1
- For Fill Junctions that Interface with MINET, the Tabular Specification (vs. time) Option Should be Specified

MINET

- At the Interface Locations, Cells Should Be Sized Consistant with Fig 4-1
- For Interface Boundaries, Must Specify Flow at Inlet Boudaries and Pressure at Outlet Boundaries for BOTH Steady State and Transient
- Set End of Transient Simulation Time Larger Than RETRAN Run End Time
- Interface Boundary Tables Must Include Only 2 times:0.0 and 999999.0

Even when MINET reads in English units and prints out in English units, it calculates in SI units. The following conversion constants are used in the interface routines to convert from RETRAN english units to MINET metric units:

Multiply English Unit by these constants to obtain Metric Units

CONSP =6894.757E+03 ! Pascal/PSIA
CONSH =1055.056E+03 ! Joules/BTU
CONSM =0.4535924 ! Kg/Lbm

If SI units are chosen, the data syntax is that described in the MINET User's Manual. If, however, MINET data is to be specified in British units, a small change is required in the file description record preceding the MINET data. If the data is in SI units, the MINET data file-record should be:

ØV MINTD

To specify British units, simply change the "D" in MINTD to "B" (see also Figure 5-8).

ØV MINTB

A full data description can be found in the revised version of the MINET User's Manual. All output is reported in the unit system chosen for input.

4. CODE UPDATES

(to RETRAN Code)

/* Modification to RETRAN (02-MOD04) for RETRAN/MINET implementation

*AF
*CD /MININT/
c /minint/
common /imnint/ lnkmax, istr, iprt
common /rmnint/ timnem, timolm, deltm

c
*AF
*CD /MRCLST/
c /mrclst/
character*8 clnk, cntd, cmt, cnfil, cmfil,
+ cptabl, cttabl, cxtabl, cztabl, cwpm, chpm,
+ cpjunm, cfiltbm, cfilenm, cfilprm, cajuntm, cpm,
+ chwm, czmm, cavexm, czvolm,
+ ck8pmci, ck8prci, cc8pta, cf8pc1, cf8pc2, cf8gc2
+ ck8gtci, ck8gmci, ck8grci, cc8gta, cf8gc1, cf8gc2

c
*AF
*CD /MRVDAT/
c /mrvdat/
data clnk, cntd, cmt, cnfil, cmfil,
+ cptabl, cttabl, cxtabl, cztabl, cwpm, chpm,
+ cpjunm, cfiltbm, cfilenm, cfilprm, cajuntm, cpm,
+ chwm, czmm, cavexm, czvolm,
+ ck8pmci, ck8prci, cc8pta, cf8pc1, cf8pc2, cf8gc2
+ ck8gtci, ck8gmci, ck8grci, cc8gta, cf8gc1, cf8gc2

*CA /MRVNAM/
*AF
*CD /MRVNAM/
+ / LNK : NTD : MTD : NFILE : MFILE :
+ PTABL : TTABL : XTABL : ZTABL : WPM :
+ HPM : PJUNM : FILTBM : FILENM : FILPRM :
+ AJUNTM : PM : HWM : ZMM : AVEXM :
+ ZVOLM : K8PMCI : K8PRCI : C8PTA : F8PC1 :
+ F8PC2 : K8GTICI : K8GMCI : K8GRCI : C8GTA :
+ F8GC1 : F8GC2 : /

c
*AF
*CD /BRITSC/
c /britsc/
common /britsc/ ftm, elbkg, psipa, btuj, fr,
+ fk, hrs

c
*AF
*DK STLINK
subroutine stlink(iflag)

c
COM -----
COM STEADY STATE LINK BETWEEN MINET AND RETRAN
COM CALLED FROM STSTAT IN RETRAN
COM TRANSIENT LINK BETWEEN MINET AND RETRAN
COM -----
COM IFLAG=0 ----->> STEADY STATE CALCULATION
COM IFLAG=1 ----->> TRANSIENT CALCULATION
COM -----

c
*CA BKCM
*CA ID02
*CA /MRCLST/
*CA /MININT/

*CA /MRVDAT/
*CA /BRITSC/

c
c
dimension title(7)
dimension s(24)
logical err, tdverr
integer error, dbg
character*8 blnk

c
data dbg /22/
data blnk /' /

c

c
istr=istr+1

c
COM =====
COM -CHANGE THE RETRAN INPUT TABLES
COM =====

c
if (iprt.ne.0) write(dbg,2338)

c
COM -----
COM -PUT MINET FILL DATA PM,HWM,ZMM,AVEXM (IN CELL VOLUME)
COM -CODES 1=ENTHALPY,2=PRESSURE,3=FLOW
COM -----

c
call gtim9u(clnk,+1,lnk1)
do 1000 i=1,lnkmax
nlink = i
call gtim9u(clnk,i,lnk)
if (lnk.eq.2 .or. lnk.eq.3) then
call gtim9u(cmfil,i,mfil)
call gtrm9u(cpm,i,pm)
call gtrm9u(chwm,i,hwm)
pres = pm*psipa
enth = hwm*(btuj/elbkg)
call putb3x(mfil,2, 0.0,pres,error)
call putb3x(mfil,2,999999.0,pres,error)
if (error.ne.0) write(6,12) error
call putb3x(mfil,1, 0.0,enth,error)
call putb3x(mfil,1,999999.0,enth,error)
if (error.ne.0) write(6,13) error

c
COM -NOT AVAILABLE IN MINET.
CCC CALL PUTB3X(mfil,#,TIMNEM,ZMM ,ERROR)
CCC CALL PUTB3X(mfil,#,TIMNEM,AVEXM ,ERROR)

c
if (iprt.ne.0) then
call gtrm9u(czmm,i,zmm)
call gtrm9u(cavexm,i,avexm)
write(dbg,2222)
write(dbg,3401) pm
write(dbg,3402) hwm
write(dbg,3403) zmm
write(dbg,3404) avexm
write(dbg,3405) pres
write(dbg,3406) enth
write(dbg,2222)

```

        endif
    endif
C
COM -----
COM -PUT MINET TDV DATA WPM,HPM,PJUNM (AT JUNCTION)
COM -----
C
    if (lnk.eq.1 .or. lnk.eq.3) then
        call gtrm9u(cpjunm,i,pjunm)
        call gtrm9u(chpm,i,hpm)
        call gtrm9u(cwpm,i,wpm)
        pres = pjunm*psipa
        enth = hpm*(btuj/elbkg)
        flow = wpm*elbkg
C
        call gtim9u(cmt,d,i,mtd)
        call putb3x(mtd,1,0.0,enth,error)
        call putb3x(mtd,1,999999.0,enth,error)
        call putb3x(mtd,3,0.0,flow,error)
        call putb3x(mtd,3,999999.0,flow,error)
        if (iprt.ne.0) then
            write(dbg,2222)
            write(dbg,3501) pjunm
            write(dbg,3502) hpm
            write(dbg,3503) wpm
            write(dbg,3504) pres
            write(dbg,3505) enth
            write(dbg,3506) flow
            write(dbg,2222)
        endif
    endif
    endif
1000 continue
C
    if (iprt.ne.0) write(dbg,3601) iflag
C
COM =====
COM MINET STEADY STATE CALL
COM =====
C
    if (iflag.eq.0 .and. lnk1.ge.0) then
        err = .FALSE.
        do i=1,lnkmax
            call gtim9u(cnfil,i,nfil)
            if (nfil.lt.0) then
                write(6,11) -nfil
                err = .TRUE.
            endif
        enddo
        if (err .or. tdverr()) stop 'stlink'
        call mint3s
    endif
C
    if (iflag.eq.1) then
        continue
C
COM =====
COM -MINET TRANSIENT CALL
COM =====
C

```

-33-

```

        if(lnk1.ge.0) then
C
C     -transfers retran controller function output to minet
C     time dependent look-up tables
C
        l = 0
        ll = lgnt9u(ck8gmci)
        do while (l.lt.ll)
            l = l+1
            call gtim9u(ck8grci,l,k8grci)
            call gtrcho(k8grci,value)
            call gtim9u(ck8gtci,l,k8gtci)
            call gtim9u(ck8gmci,l,k8gmci)
            if (k8gtci.gt.0) then
                call ptrm9u(blnk,k8gtci,0.0)
                call ptrm9u(blnk,k8gtci+1,999999.0)
                call gtrm9u(cf8gc1,l,f8gc1)
                call gtrm9u(cf8gc2,l,f8gc2)
                call ptrm9u(blnk,k8gmci,(value*f8gc1+f8gc2))
                call ptrm9u(blnk,k8gmci+1,(value*f8gc1+f8gc2))
            else
                modid = iabs(k8gtci)
                call putb3x(modid,k8gmci,0.0,value,lerrs)
                call putb3x(modid,k8gmci+1,999999.0,value,lerrs)
            endif
        enddo
C
        I2=FILIDX(2)
        call time3t(end,timnem,print,deltm,INEXPL(I2))
        call mint3t(timnem,print,deltm,ierr,INEXPL(I2))
        if (ierr.eq.0) then
C
C     -insert minet values into retran function generator table
C
        l = 0
        ll = lgnt9u(ck8pmci)
        do while (l.lt.ll)
            l = l+1
            call gtim9u(ck8pmci,l,k8pmci)
            call gtrm9u(blnk,k8pmci,value)
            call gtrm9u(cf8pc1,l,f8pc1)
            call gtrm9u(cf8pc2,l,f8pc2)
            print*, ' value=',value
            value = value*f8pc1+f8pc2
            call gtim9u(ck8prci,l,k8prci)
            print*, ' new value=',value, ' k8prci=',k8prci
            call ptrfgt(k8prci,timnem,value)
        enddo
        else
            write(6,110) ierr
            stop 'stlink'
        endif
    endif
    endif
C
    if (iprt.ne.0) write(dbg,3601) iflag
C
COM -----
COM -GET MINET FILL DATA FILTBM,FILENM,FILPRM (FROM JUNCTION)
COM -----

```

```

COM -----
COM -CODES 1=ENTHALPY,2=PRESSURE,3=FLOW
COM -----

```

```

C
do 2000 i=1,lnkmax
  nlink = i
  call gtim9u(clnk,i,lnk)
  if (lnk.eq.2 .or. lnk.eq.3) then
    call gtim9u(cmfil,i,mfil)
    call getint(mfil,flow,enth)
    call getb3u(mfil,2,pres,error)
    if (iprt.ne.0) then
      write(dbg,2222)
      write(dbg,3001) pres
      write(dbg,3002) enth
      write(dbg,3003) flow
      write(dbg,2222)
    endif
    flow = flow /elbkg
    enth = enth /(btuj/elbkg)
    pres = pres /psipa
    call gtrm9u(cajuntm,i,ajuntm)
    call ptrm9u(cfilprm,i,pres)
    call ptrm9u(cfilenm,i,enth)
    call ptrm9u(cfiltbm,i,flow/ajuntm)
    if (iprt.ne.0) then
      write(dbg,2222)
      write(dbg,3101) pres
      write(dbg,3102) enth
      write(dbg,3103) flow
      write(dbg,3104) flow/ajuntm
      write(dbg,2222)
    endif
  endif
endif

```

```

C -----
COM -GET MINET TDV DATA PTABLM,TTABLM,XTABLM,ZTABLM (IN CELL VOLUME
COM PSIA ,DEG F ,QUALITY,FEET
COM -----

```

```

C
if (lnk.eq.1 .or. lnk.eq.3) then
  call gtim9u(cmt,d,i,mtd)
  call getb3u(mtd,2,pres,error)
  call getb3u(mtd,1,enth,error)

```

```

C -----
COM -MINET FUNCTIONS (ALTERNATE TO RETRAN FUNCTIONS)
COM -----
COM -OPTION 1.

```

```

C
call ptrm9u(cptabl,i,pres/psipa)
ttab = temp3c(enth,pres,1,3)
ttab = ttab-273.13
call ptrm9u(cttabl,i,ttab*1.8+32.0)
hg = estv3h(pres)
hf = estl3h(pres)
hfg = hg-hf
call ptrm9u(cxtabl,i,(enth-hf)/hfg)
call gtrm9u(czvolm,i,zvolm)
call ptrm9u(cztabl,i,zvolm)

```

```

call gtim9u(cmt,d,i,mtd)
call getb3u(mtd,3,flow,error)
if (iprt.ne.0) then
  write(dbg,2222)
  write(dbg,3201) pres
  write(dbg,3202) enth
  write(dbg,3207) flow
  write(dbg,3208) ttab+273.13
  write(dbg,3203) ttab
  write(dbg,3204) hf
  write(dbg,3205) hg
  write(dbg,3206) hfg
  write(dbg,2222)
endif

```

```

C
if (iprt.ne.0) then
  call gtrm9u(cptabl,i,ptabl)
  call gtrm9u(cttabl,i,ttabl)
  call gtrm9u(cxtabl,i,xtabl)
  call gtrm9u(cztabl,i,ztabl)
  write(dbg,2222)
  write(dbg,3301) ptabl
  write(dbg,3302) ttabl
  write(dbg,3303) xtabl
  write(dbg,3304) ztabl
  write(dbg,2222)
endif

```

```

C -----
COM WE MUST USE THE RETRAN THERMO FUNCTIONS TO AVOID THE AMBIGUITY
COM OF THE RETRAN-MINET HAVING DIFFERENT SATURATION TEMPERATURES
COM BECAUSE OF SLIGHTLY DIFFERENT THERMO PROPERTY FUNCTIONS.
COM PASSING P,H INSTEAD OF P,T AVOIDS CALCULATIONAL TRAPS.
COM -----
COM RETRAN FUNCTIONS (ALTERNATE TO MINET FUNCTIONS)
COM THERE IS ABOUT A 1 DEGREE F DIFFERENCE IN THE MINET-
COM RETRAN TEMPERATURES. MINET IS HIGHER.
COM -----

```

```

C
s(2) = pres /(psipa)
s(5) = enth /(btuj/elbkg)
call wat5(s,iphase,err)

```

```

C
if (iprt.ne.0) write(dbg,3811) iphase,err,(s(j),j=1,24)

```

```

C -----
COM THESE ARE RETURNED AS ZERO FROM WAT5 AND CAN'T
COM BE USED IN THE SUBCOOLED OR SUPERHEATED REGIONS.
COM -----

```

```

COM
CCC HF=S(15)
CCC HG=S(16)
CCC HFG=HG-HF
CCC call ptrm9u(cxtabl,I,(S(5)-HF)/HFG)

```

```

COM -----
COM S(9) RETURNS 0 OR 1 IN ONE-PHASE REGIONS AN CAUSES
COM RETRAN TO USE SATURATION PRESSURE FOR AN INPUT H.
CCC call ptrm9u(cxtabl,I,S(9))
COM -----

```

```

C

```

```

call ptrm9u(cptablm,i,pres/psipa)
call ptrm9u(cttablm,i,s(1))
call gtrm9u(cptablm,i,ptablm)
call horn(idum,ptablm,1,hf,dhfdp)
call horn(idum,ptablm,2,hg,dhgdp)
hfg = hg-hf
call ptrm9u(cxtablm,i,(s(5)-hf)/hfg)
call gtrm9u(czvolm,i,zvolm)
call ptrm9u(cztablm,i,zvolm)

```

```

c
if (iprt.ne.0) then
write(dbg,2222)
write(dbg,3701) pres
write(dbg,3702) enth
write(dbg,3707) flow
write(dbg,3801) s(2)
write(dbg,3802) s(5)
call gtrm9u(cttablm,i,ttablm)
write(dbg,3709) (ttablm-32.)*(5./9.)+273.13
write(dbg,3708) (ttablm-32.)*(5./9.)
write(dbg,3703) ttablm
write(dbg,3704) hf
write(dbg,3705) hg
write(dbg,3706) hfg
write(dbg,2222)
call gtrm9u(cptablm,i,ptablm)
call gtrm9u(cxtablm,i,xtablm)
call gtrm9u(cztablm,i,ztablm)
write(dbg,3803) ptablm
write(dbg,3804) ttablm
write(dbg,3805) xtablm
write(dbg,3806) ztablm
write(dbg,2222)
endif

```

```

c
COM -----
COM -MIXED RETRAN-MINET FUNCTIONS
COM -----
COM -OPTION 3.
COM
CCC   TTAB=TEMP3C(ENTH,PRES,1,3)
CCC   TTAB=TTAB-273.13
CCC   call ptrm9u(cttablm,I,TTAB*1.8 + 32.0)
COM
CCC   call ptrm9u(cptablm,i,pres /psipa)
COM
CCC   CALL HORN(IDUM,ptablm,1,HF,DHF)
CCC   CALL HORN(IDUM,ptablm,2,HG,DHG)
CCC   HFG=HG-HF
CCC   enth=enth/(btuj/elbkg)
CCC   call ptrm9u(cxtablm,I,(ENTH-HF)/HFG)
CCC   call gtrm9u(czvolm,i,zvolm)
CCC   call ptrm9u(cztablm,i,ZVOLM)
COM -----
COM -DELETED - TDV DOES NOT PERMIT BUBBLE RISE MODEL IN
COM RETRAN-MINET SHARED VOLUME
COM -----
CCC   call gtrm9u(cXTABLm,I,x)
CCC   call gtrm9u(czvolm,i,zvolm)
CCC   IF(X.LE.0.0) call ptrm9u(cZTABLM,I,1.0*ZVOLM)

```

```

CCC   IF(X.GT.1.0) call ptrm9u(cZTABLM,I,0.0*ZVOLM)
CCC   IF(X.GT.0.0 .AND. X.LE.1.0)
CCC   call ptrm9u(cZTABLM,I,(1.0-X)*ZVOLM)

```

```

endif
2000 continue
c
COM =====
COM -DUMP THE COMMON BLOCK
COM =====
c
if (iprt.ne.0) call dumpco
c
COM -----
COM -END OF FILE EXIT TAPE 23
COM -NO DATA, DON'T EXECUTE MINET
COM -----

```

```

c
if (lnkmax.eq.0) call ptim9u(clnk,+1,-1)
c
return
11 format('>>>ERROR... RETRAN fill junction ',i6,' is improperly ',
+ 'defined.')
12 format(8H ERROR1 ,I2)
13 format(8H ERROR2 ,I2)
110 format('OMINET TRANSIENT STEP ERROR ',i3,' - SUBROUTINE STLINK ')
2222 format(' ')
2300 format(8A10)
2301 format(I6)
2302 format(5I6)
2303 format(4E12.5)
2304 format(3E12.5)
2338 format(' INPUT TABLES CHANGED - SUBROUTINE STLINK ')
3001 format(' PRES (FILL FROM MINET) (PASCAL ) ',G20.9)
3002 format(' ENTH (FILL FROM MINET) (JOULES/KG) ',G20.9)
3003 format(' FLOW (FILL FROM MINET) (KG/SEC) ',G20.9)
3101 format(' FILPRM (FILL TO RETRAN) (PSIA. ) ',G20.9)
3102 format(' FILENM (FILL TO RETRAN) (BTU/LBM ) ',G20.9)
3103 format(' FLOW (FILL TO RETRAN) (LBM/SEC) ',G20.9)
3104 format(' FLOW/A (FILL TO RETRAN) (LBM/SEC/FT/FT) ',G20.9)
3201 format(' PRES (TDV FROM MINET) (PASCAL ) ',G20.9)
3202 format(' ENTH (TDV FROM MINET) (JOULES/KG) ',G20.9)
3207 format(' FLOW (NOT USED MINET) (KG/SEC) ',G20.9)
3208 format(' TTAB (TDV FROM MINET) (DEG. K ) ',G20.9)
3203 format(' TTAB (TDV FROM MINET) (DEG. C ) ',G20.9)
3204 format(' HF (TDV FROM MINET) (JOULES/KG) ',G20.9)
3205 format(' HG (TDV FROM MINET) (JOULES/KG) ',G20.9)
3206 format(' HFG (TDV FROM MINET) (JOULES/KG) ',G20.9)
3301 format(' PTABLM (TDV TO RETRAN) (PSIA. ) ',G20.9)
3302 format(' TTABLM (TDV TO RETRAN) (DEG F. ) ',G20.9)
3303 format(' XTABLM (TDV TO RETRAN) (QUALITY ) ',G20.9)
3304 format(' ZTABLM (TDV TO RETRAN) (LEVEL - FT. ) ',G20.9)
3401 format(' PM (FILL FROM RETRAN) (PSIA. ) ',G20.9)
3402 format(' HWM (FILL FROM RETRAN) (BTU/LBM ) ',G20.9)
3403 format(' ZMM (FILL FROM RETRAN) (LEVEL - FT. ) ',G20.9)
3404 format(' AVEXM (FILL FROM RETRAN) (QUALITY ) ',G20.9)
3405 format(' PRES (FILL TO MINET) (PASCAL ) ',G20.9)
3406 format(' ENTH (FILL TO MINET) (JOULES/KG) ',G20.9)
3501 format(' PJUNM (TDV FROM RETRAN) (PSIA. ) ',G20.9)
3502 format(' HPM (TDV FROM RETRAN) (BTU/LBM ) ',G20.9)
3503 format(' WPM (TDV FROM RETRAN) (LBM/SEC ) ',G20.9)

```

```

3504 format(' PRES (TDV NOT SENT) (PASCAL ) ',G20.9)
3505 format(' ENTH (TDV TO MINET) (JOULES/KG) ',G20.9)
3506 format(' FLOW (TDV TO MINET) (KG/SEC) ',G20.9)
3601 format(' IFLAG = ',17,' MINT3S(IF IFLAG=0), MINT3T(IF IFLAG=1)')
3701 format(' PRES (TDV FROM MINET) (PASCAL ) ',G20.9)
3702 format(' ENTH (TDV FROM MINET) (JOULES/KG) ',G20.9)
3707 format(' FLOW (NOT USED MINET) (KG/SEC) ',G20.9)
3801 format(' S(2)=P (TDV TO RETRAN WAT5) (PSIA.) ',G20.9)
3802 format(' S(5)=H (TDV TO RETRAN WAT5) (BTU/LBM) ',G20.9)
3709 format(' TTABLM (TDV FROM RETRAN WAT5) (DEG. K) ',G20.9)
3708 format(' TTABLM (TDV FROM RETRAN WAT5) (DEG. C) ',G20.9)
3703 format(' TTABLM (TDV FROM RETRAN WAT5) (DEG. F) ',G20.9)
3704 format(' HF (TDV FROM RETRAN HORN) (BTU/LBM) ',G20.9)
3705 format(' HG (TDV FROM RETRAN HORN) (BTU/LBM) ',G20.9)
3706 format(' HFG (TDV FROM RETRAN HORN) (BTU/LBM) ',G20.9)
3803 format(' PTABLM (TDV TO RETRAN WAT5) (PSIA.) ',G20.9)
3804 format(' TTABLM (TDV FROM RETRAN WAT5) (DEG F. ) ',G20.9)
3805 format(' XTABLM (TDV FROM RETRAN HORN) (QUALITY) ',G20.9)
3806 format(' ZTABLM (TDV TO RETRAN) (LEVEL-FT.) ',G20.9)
3811 format(' RETURN FROM SUBROUTINE WAT5 IPHASE=',14,' ERR=',L1,
X /,,' S(1-24) ARRAY ',/, (6(1PE14.7)))
end

```

```

*AF
*DK FILLM
subroutine fillm(i,iget)

```

```

C
COM =====
COM -COUPLING ROUTINE TO PUT MINET DATA INTO RETRAN FILL B.C.
COM =====
COM -----
COM -THIS ROUTINE IS CALLED SEPARATELY FOR EVERY FILL JUNCTION.
COM I IS POINTER TO FILE 6 JUNCTION DATA
COM K POINTS TO FILE 14 FILL DATA
COM K = IDX14 + (IABS(IPSAV)-1)*ISIZ14
COM FILL CALLED BY ADVFLO, BUBINT, INITLZ, JUNPRP & RESOPT
COM -----

```

```

C
*CA BKCM
*CA ID02
*CA ID06
*CA ID14
*CA ID40
*CA /MRCLST/
*CA /MININT/
*CA /MRVDAT/
*CA UNIT
C
dimension iptr(10),ivols(10),jsav(10)
logical tstat,tst, filchx
integer dbg

```

```

C
data dbg /22/
data zero / 0.0 /, one / 1.0 /

```

```

C
COM -----
COM NOTE: I IS THE POINTER TO A SUB-FILE OF FILE 6.
COM : INPSI IS POINTER TO NPSI ARRAY IN FILE 40
COM : NPSI CONTAINS LIST OF JUNCTIONS IN ORDER OF SOLUTION
COM -----
C

```

```

ajtm=rstor(i+28)
C
if (iprt.ne.0) then
write(dbg,99)
write(dbg,97) i,istor(i),istor(i+1),istor(i+2),istor(i+66),ajtm
endif

```

```

C
idx05 = filidx(05)
i35 = filidx(35)
isiz05 = setsiz(05)
idx14 = filidx(14)
isiz14 = setsiz(14)
ipsav = ipump(i)
k = idx14 + (iabs(ipsav)-1)*isiz14

```

```

C
COM -----
COM K POINTS TO FILE 14 FILL DATA
COM CONTROL SYSTEM CONTROLS FILL IF 1000, I.E. NOT TIME DEP FILL
COM -----
C

```

```

if (itfill(k).eq.1000) then
junct = istor(i+66)
if (iprt.ne.0) write(dbg,311) junct
if (filchx(junct,junum)) then
call ptim9u(cnfil,junum,-junct)
write(6,311) junct
endif
go to 9999
endif

```

```

C
COM -----
COM TSTAT RETURNS TRUE IF TRIP OCCURED
COM RETURNS DELT=ELAPSED TIME SINCE TRIP
COM DELT=TIMEX(17)-TRPT(I)
COM TIMEX=>17TH WORD IN FILE 7=OVERALL PROBLEM TIME
COM TRPT(I)=>5TH WORD IN SUBFILE ID IN FILE 39
COM -----
C

```

```

tst = tstat(itfill(k),delt)
idx07 = filidx(07)
idx39 = filidx(39)
timex = rstor(idx07+16)
time = timex
if (time.eq.0.0 ) then
timolm = 0.0
deltm = 0.0
endif
if (time.ne.timnem) then
deltm = time-timnem
timolm = timnem
endif
timnem = time
tript = timex-delt
if (.not.tst) then
junct = istor(i+66)
if (iprt.ne.0) write(dbg,321) junct
if (filchx(junct,junum)) then
call ptim9u(cnfil,junum,-junct)
write(6,321) junct
endif
endif

```

```

      go to 9999
    endif
  C
  if (iprt.ne.0) then
    if (istrt.eq.1) write(dbg,98)
    write(dbg,103) timex,istrt
    write(dbg,201) timex,tript,delt
  endif
  C
  COM -----
  COM -TEST FOR PRESSURE DEPENDENT FILL
  COM -----
  C
  if (jx(k).ne.0) then
    junct = istor(i+66)
    if (iprt.ne.0) write(dbg,331) junct
    if (filchx(junct,junum)) then
      call ptim9u(cnfil,junum,-junct)
      write(6,331) junct
    endif
    go to 9999
  endif
  C
  idx02 = filidx(02)
  idx06 = filidx(06)
  isiz06 = setsiz(06)
  idx40 = filidx(40)
  inpsi = ixnpsi(idx40)
  nx1 = nx(idx40)
  nx2 = nx1+1
  njun1 = njun(idx02)
  C
  COM -----
  COM JJSV THE NUMBER OF FILL JUNCTIONS FOUND
  COM JSAV(JJ) CONTAINS THE JUNCTION NUMBER OF FILL JUNCTIONS
  COM IVOLS(JJ) CONTAINS THE VOLUME NUMBERS CONNECTED TO FILL JUNCTS
  COM -----
  C
  jj=0
  do 3 j=1,njun1
    ipsi = npsi(inpsi+j-1)
    ii = idx06+(ipsi-1)*isiz06
    iiw1 = istor(ii)
    iiw2 = istor(ii+1)
    junold = istor(ii+66)
    ajtm = rstor(ii+28)
  C
  COM -----
  COM CHECK IF THIS IS A COUPLING FILL JUNCTION
  COM NLINK IS THE SET/GET FILL POINTER
  COM NOTE: THIS IS THE ONLY PLACE NLINK DEFINED
  COM -----
  C
  if (i.eq.ii) then
    nlink=0
    do 31 kj=1,lnkmax
      call gtim9u(clnk,kj,lnk)
      call gtim9u(cnfil,kj,nfil)
      if (junold.eq.nfil .and. (lnk.eq.2 .or. lnk.eq.3)) then
        nlink=kj

```

```

      if (iiw1.eq.0 .or. iiw2.eq.0) then
        jj = jj+1
        iptr(jj)=ii
      endif
      if (iiw1.eq.0) then
        ivols(jj)=iiw2
        jsav(jj) =j
      endif
      if (iiw2.eq.0) then
        ivols(jj)=iiw1
        jsav(jj) =j
      endif
      if (iprt.ne.0) write(dbg,102)j,ipsi,ii,iiw1,iiw2,juno1
      go to 11
    endif
  31 continue
  endif
  3 continue
  11 continue
  jjsav=jj
  C
  if(nlink.eq.0) go to 110
  C
  call ptrm9u(cajuntm,NLINK,AJTM)
  C
  COM =====
  COM -BEGIN SET FILL DATA
  COM =====
  COM -TIME DEPENDENT FILL
  COM READ THE TABLES AND PRINT THEM.
  C
  if (iget.ne.1) then
    if (iprt.ne.0) then
      write(dbg,203) nfill(k)
      x , istor(k+1)
      x , istor(k+2)
      x , istor(k+3)
      x , istor(k+4)
      write(dbg,204) istor(k+5)
      x , istor(k+7)
      x , istor(k+8)
      x , istor(k+9)
      x , rstor(k+6)
      write(dbg,309)
      write(dbg,206)
    endif
    mnfill = nfill(k)
    mnfila = iabs(mnfill)
  C
  COM -----
  COM -SET RETRAN FILL TABLES FROM COMMON BLOCK MINRAN
  COM -----
  C
  do 15 m=1,mnfila
    call gtrm9u(cfiltbm,nlink,filtbm)
    filtbl(idxflt(k)+2*m-1)=filtbm
    call gtrm9u(cfilenm,nlink,filenm)
    filent(idxent(k)+ m-1)=filenm
    call gtrm9u(cfilprm,nlink,filprm)
    filprs(idxprs(k)+ m-1)=filprm

```

```

      if (iprt.ne.0) write(dbg,205) rstor (idxflt(k)+2*m-2)
x      ,filtbl(idxflt(k)+2*m-1)
x      ,filent(idxent(k)+ m-1)
x      ,filprs(idxprs(k)+ m-1)
15 continue
c
COM -----
COM SET RETRAN JUNCTION FILE 6 QUANTITIES DIRECTLY BECAUSE IN
COM THE STEADY STATE OPTION THE FILL TABLES ARE NOT USED
COM -----
c
      call gtrm9u(cfiltbm,nlink,filtbm)
      call gtrm9u(cajuntm,nlink,ajuntm)
      wp(i) = filtbm*ajuntm
      call gtrm9u(cfilenm,nlink,filenm)
      hp(i) = filenm
      call gtrm9u(cfilprm,nlink,filprm)
      pjun(i) = filprm
      if (iprt.ne.0) then
          write(dbg,22)
          write(dbg,5052) junold
      endif
endif
c
COM -----
COM -TIME DEPENDENT FILL
COM -DELT=ELAPSED TIME SINCE TRIP (SAME FORMAT AS INPUT TABLES)
COM -IABS(NFILL) IS THE NUMBER OF DATA POINTS IN FILL TABLE.
COM -----
c
      xindep = delt
      if (iprt.ne.0) write(dbg,105) delt
c
COM =====
COM -BEGIN GET FILL DATA
COM =====
COM -----
COM -LOOP OVER VOLUMES TO MATCH IVOLS
COM FOR ALL JJSV FILL JUNCTIONS
COM -----
COM =====
COM -WITH LOOP 3 REPLACING 1 AND 2
COM JJSV WILL BE 1 (ONE TRIP LOOP)
COM =====
c
      if (iget.eq.2) go to 5051
c
      do 505 jj=1,jjsav
          idx05 = filidx(05)
          len5 = setsiz(05)
          idxlas = idx05+(nvol(idx02)-1)*len5
          junfil = 0
          if (iprt.ne.0) write(dbg,22)
          do 500 i=idx05,idxlas,len5
              iolvol = istor(i+81)
              if (iprt.ne.0)
+                  write(dbg,501) jsav(jj),ivol(jj),iolvol,i,isav,junfil
              if (iolvol.eq.ivols(jj)) then
                  isav = i
                  junfil = junfil+1

```

```

          go to 510
          endif
500 continue
510 continue
c
COM -----
COM -CHECK IF THIS IS A COUPLING FILL JUNCTION
COM -NLINK IS THE SET/GET FILL POINTER
COM -----
c
      nlink=0
      do 505 kj=1,lnkmax
          call gtim9u(clnk,kj,lnk)
          call gtim9u(cnfil,kj,nfil)
          if(junold.eq.nfil .and. (lnk.eq.2 .or. lnk.eq.3)) then
              nlink = kj
c
COM -----
COM -WRITE THE TDV QUANTITIES FOR MINET
COM VOLUME PROPERTIES OF VOLUME CONNECTED
COM TO FILL JUNCTION JJ
COM -----
c
          if (iprt.ne.0)
+              write(dbg,501) jsav(jj),ivol(jj),iolvol,i,isav,junfil
              call ptrm9u(cpm, nlink,rstor(isav+2))
              call ptrm9u(czmm, nlink,rstor(isav+7))
              call ptrm9u(chwm, nlink,rstor(isav+23))
              call ptrm9u(cavexm,nlink,rstor(isav+27))
              if (iprt.ne.0) write(dbg,502) rstor(isav+2)
x                  ,rstor(isav+3)
x                  ,rstor(isav+23)
x                  ,rstor(isav+27)
x                  ,rstor(isav+75)
x                  ,rstor(isav+90)
x                  ,istor(isav+81)
x                  ,rstor(isav+34)
x                  ,rstor(isav+35)
x                  ,rstor(isav+36)
          endif
505 continue
c
          if (iprt.ne.0) write(dbg,5053) junold
c
5051 continue
c
COM =====
COM -DUMP THE COMMON BLOCK
COM =====
c
          if (iprt.ne.0) call dumpco
110 continue
c
COM =====
COM -EXIT BRANCH WHEN NLINK=0
COM =====
c
9999 continue
c
      RETURN

```

```

22 format(1H )
97 format(' F6 POINTER =',I7
X      CONNECTS VOLS',2I4
X      IPUMP=',I4
X      JUNOLD =',I4
X      AJUNTM =',1PE12.5
X      )
98 format(' FILLM LIMITED TO TIME VS. FLOW TABLE <FOR NOW>')
99 format(/,' ---SUBROUTINE-FILLM-----')
102 format(' F6 JUNCT=',I5,
X      F40 JUNCT=',I5,
X      PTR TO SUB F6=',I7,
X      CONNECTS VOLS.',2I5,
X      JUNOLD =',I5
X      )
103 format(' FILL SYSTEM OPERATING      , TIMEX =',1PE12.5,
X      ISTRT =',I5)
105 format(/,' DELT TIME SINCE FILL BEGAN ',1PE11.4 )
201 format(' PROBLEM TIME =',1PE12.5,' TRIP TIME =',1PE12.5,
X      DELT =',1PE12.5)
203 format(/,' FILE 14 '
X      NFill =',I8
X      ITFill=',I8
X      JX =',I8
X      JY =',I8
X      IFill =',I8
X      )
204 format(/,' FILE 14 '
X      IDxFlt=',I8
X      IDxEnt=',I8
X      STHIDx=',I8
X      IDxPrs=',I8
X      PFillO=',1PE12.5
X      )
205 format(6(1PE12.5))
206 format(/
X      F13 TIME '
X      FLOW '
X      ENTHALPY '
X      PRESSURE '
X      )
309 format(/,' =====TABLES HAVE BEEN CHANGED =====FILL=====')
311 format(' >>> Junction ',i6,' is not a time dependent junction.')
321 format(' >>> Junction ',i6,' trip table not available.')
331 format(' >>> Junction ',i6,' is not a pressure dependent junction')
501 format(' JSAV=',I4
X      IVOLS=',I4
X      IOLVOL=',I4
X      VOL PTR=',I7
X      ISAV PTR=',I7
X      #FILL JUNCTS=',I4
X      )
502 format(
X      /,' VOLUME PRESSURE P=',1PE12.5
X      /,' VOLUME TEMPERATUR=',1PE12.5
X      /,' VOLUME ENTHALPY =',1PE12.5
X      /,' AVG. QUALITY =',1PE12.5
X      /,' OLD PRESSURE =',1PE12.5
X      /,' OLD TEMPERATURE =',1PE12.5
X      /,' ORIGINAL VOL. NUM=',I12

```

```

X      /,' MIX VOLUME =',1PE12.5
X      /,' GAS VOLUME =',1PE12.5
X      /,' LIQUID VOLUME =',1PE12.5
X      )
5052 format(' JUNOLD =',I5, /
*      ' =====' /
*      ' END SET FILL DATA' /
*      ' =====' /)
5053 format(' JUNOLD =',I5, /
*      ' =====' /
*      ' END GET FILL DATA' /
*      ' =====' /)
END
*AF
*DK TDV
subroutine tdv(iget)
C
COM SUBROUTINE FOR TIME DEPENDENT VOLUME HERE.
C
*CA BKCM
*CA ID02
*CA ID05
*CA ID07
*CA ID33
C
dimension junsav(10)
C
COM -----
COM DUMMY ARRAYS FOR PRINT
COM -----
C
dimension itmp1(10),itmp2(10)
dimension tmp1(10),tmp2(10),tmp3(10),tmp4(10),tmp5(10)
C
*CA /MRCLST/
*CA /MININT/
*CA /MRVDAT/
C
integer dbg
data dbg /22/
C
COM -----
COM FILE 5 = VOLUME QUANTITIES
COM FILE 2 = PROBLEM DIMENSIONS
COM FILE 33= TIME DEPENDENT VOLUME DATA
COM -----
C
idx02 = filidx(02)
idx05 = filidx(05)
idx06 = filidx(06)
idx07 = filidx(07)
idx33 = filidx(33)
io5s = setsiz(5)
io5e = idx05+(nvool(idx02)-1)*io5s
C
COM -----
COM CHECK ALL VOLUMES FOR TIME DEP. VOL. B.C.
COM FILE 5 (VOLUME QUANTITIES) NVOL SETS TO CHECK
COM FILE 2 DEFINES NVOL (POSITION 5) = NO. OF VOL'S
COM FILE 2 DEFINES NTDV (POSITION 7) = NO. OF TDV'S

```

```

COM -----
C
time = timex(idx07)
if (time.eq.0.0) then
  timolm = 0.0
  deltm = 0.0
endif
if (time.ne.timnem) then
  deltm=time-timnem
  timolm=timnem
endif
timnem = time
timep = timex(idx07)

C
if (iprt.ne.0) then
  write(dbg,99)
  write(dbg,401) timep,istrt
endif

C
num = 0
len5 = io5s

C
COM -----
COM -PROCESS NVOL BLOCKS OF FILE 5 DATA.
COM -FIND IF ANY POINT TO FILE 33 INPUT TDV DATA
COM -----
COM -VOLUME LOOP
COM -IREAD IS VOLUME RETRIEVAL INDEX FROM FILE 5 POSITION 2
COM -IR IS 1,2,3,...,NTDV
COM -IF NO TDV POINTER TO FILE 33 FROM FILE 5, EXIT LOOP
COM -----
C
do 100 k=idx05,io5e,len5
  if (num.ge.ntdv(idx02)) go to 9999
  ir=iread(k)
  if (iprt.ne.0)
+   write(dbg,301) k,iread(k),ntdv(idx02),nvol(idx02),
+   num,olvoln(k)

C
  if (ir.gt.0) then

C
COM -----
COM TESTS FOR LOOP EXIT
COM TEST IF OLVOLN(K) MATCHES NTD(KI)
COM IF YES CONTINUE, ELSE GO TO END OF LOOP
COM -----
C
  nlink = 0
  do 101 ki=1,lnkmax
    call gtim9u(clnk,ki,lnk)
    call gtim9u(cntd,ki,ntd1)
    if (ntd1.eq.olvoln(k) .and.
+   (lnk.eq.1 .or. lnk.eq.3) ) then

C
COM -----
COM -IF BOTH CONDITIONS ABOVE TRUE, THEN CONTINUE.
COM -ELSE THIS IS NOT A COUPLING TDV, SO EXIT LOOP.
COM -NOTE: THIS IS THE ONLY PLACE NLINK IS DEFINED.
COM -----

```

```

C
  if (iprt.ne.0) write(dbg,1001) k,ki,olvoln(k),lnk

C
COM -----
COM -FOUND A VOLUME THAT POINTS TO TDV DATA.
COM -----
C
  nlink=ki
  call ptrm9u(czvolm,ki,zvol(k))
  num=num+1

C
COM -----
COM -FILE 33 SUBLOOP DISPLAYING TIME DEPENDENT VOLUME DATA
COM DATA STORED IN TEMPORARY ARRAYS FOR DISPLAY.
COM -MMAX IS THE NUMBER OF POINTS IN THE TABLE (IN GROUPS OF 5)
COM -----
C
  i = iir(idx33+ir-1)
  idxtb = idxvt(idx33+ntdv(idx02)+ir-1)
  mmax = irin(idxtb)

C
COM -----
COM -MMAX=LENGTH OF DATA(NO. OF TIME POINTS IN TABLE)
COM -----
COM =====
COM BEGIN SET TDV DATA
COM =====
C
  if(iget.eq.2) then
    if (iprt.ne.0) write(dbg,309)

C
    do 15 m=1,mmax
      if (m.gt.10) go to 16
      idxtb = idxvt(idx33+ntdv(idx02)+ir-1)
      idxtbl=idxtb + (m-1)*5 + 1
      idxtbk=idxtbl+5

C
COM -----
COM -I=IIR IS THE CURRENT TABLE INDEX (FROM IDX33 TO IDX33+NTDV-1)
COM -IDXTB =INDEX OF FILE CONTAINING TIME DEP. DATA TABLES
COM -IDXTBL=POINTS TO TIME VARIABLE OF CURRENT INTERP VALUE
COM -IDXTBK=POINTS TO TIME VARIABLE OF NEXT INTERPOLATION POINT
COM -----
COM -SET RETRAN TDV TABLES FROM COMMON BLOCK MINRAN
COM -----
C
  call gtrm9u(cptabl,m,nlink,ptabl)
  ptabl (idxtbl)=ptabl
  call gtrm9u(cttabl,m,nlink,ttabl)
  ttabl (idxtbl)=ttabl
  call gtrm9u(cxtabl,m,nlink,xtabl)
  xtabl (idxtbl)=xtabl
  call gtrm9u(cztabl,m,nlink,ztabl)
  ztabl (idxtbl)=ztabl

C
COM -----
COM WRITE OUT THE CONTENTS OF THE TABLES USING TMP VARIABLES
COM -----
C
  tmp1(m)=timtbl(idxtbl)
  tmp2(m)=ptabl (idxtbl)

```

```

      tmp3(m)=ttabl (idxtbl)
      tmp4(m)=xtabl (idxtbl)
      tmp5(m)=ztabl (idxtbl)
15      continue
C
COM -----
COM -SET RETRAN VOLUME FILE 5 QUANTITIES DIRECTLY BECAUSE IN
COM THE STEADY STATE OPTION THE TDV TABLES ARE NOT USED
COM -----
C
      call gtrm9u(cptabl,nlink,ptabl)
      p(k) = ptabl
      call gtrm9u(cttabl,nlink,ttabl)
      temp(k) = ttabl
      call gtrm9u(cxtabl,nlink,xtabl)
      avex(k) = xtabl
      call gtrm9u(cztabl,nlink,ztabl)
      zm(k) = ztabl
C
16      continue
C
COM -BRANCH OUT IF PRINT TABLE WILL OVERFLOW - NOT AN ERROR
      ntdmax=ntdv(idx02)
      do 17 m=1,ntdmax
          itmp1(m)=iir(idx33+m-1)
          itmp2(m)=idxtvt(idx33+ntdmax+m-1)
17      continue
COM -WRITE THE RESULTS
      if (iprt.ne.0) then
          write(dbg,22)
          write(dbg,302) (itmp1(m),m=1,ntdmax)
          write(dbg,303) (itmp2(m),m=1,ntdmax)
          write(dbg,22)
          write(dbg,304) (tmp1(m),m=1,mmax)
          write(dbg,305) (tmp2(m),m=1,mmax)
          write(dbg,306) (tmp3(m),m=1,mmax)
          write(dbg,307) (tmp4(m),m=1,mmax)
          write(dbg,308) (tmp5(m),m=1,mmax)
          write(dbg,22)
          write(dbg,301) k,iread(k),ntdv(idx02),
+              nvol(idx02),num,olvoln(k)
          write(dbg,5052) olvoln(k)
      endif
      endif
C
COM =====
COM BEGIN GET TDV DATA
COM =====
C
      if (iget.eq.1) then
C
COM -----
COM -WE ARE IN A TDV SUBFILE OF FILE 6.
COM -----
C
      mvol=olvoln(k)
C
COM -----
COM -LOOP OVER JUNCTION FILE 6 TO FIND ALL IW1,IW2 VOLUMES

```

```

COM TO MATCH MVOL. MORE THAN ONE JUNCTION COULD MATCH.
COM -----
C
      njun1=njun(idx02)
      junsav(1)=-1
      len6=setsiz(06)
      if (iprt.ne.0) then
          write(dbg,22)
          write(dbg,198) idx06,len6
      endif
C
      jj=0
      do 20 jun=1,njun1
          j1 = idx06+(jun-1)*len6
          i1 = istor(j1)
          i2 = istor(j1+1)
          i3 = istor(j1+66)
          if (iprt.ne.0) write(dbg,203) j1,jun,i1,i2,i3
          if (i1.eq.mvol .or. i2.eq.mvol) then
              jj = jj+1
              junsav(jj) = jun
          endif
20      continue
      if (jj.eq.0) write(dbg,202) mvol
C
COM -----
COM -JUNSAV CONTAINS ALL JUNCTIONS CONNECTED TO OLDVOL TDV
COM -EXTRACT THE VARIABLES FROM SUBFILE JUNSAV OF FILE 6.
COM -----
C
      do 505 jun=1,jj
          j1=idx06+(junsav(jun)-1)*len6
          if (iprt.ne.0)
+              write(dbg,206)olvoln(k),istor(j1+66)
          j1 = idx06+(junsav(jun)-1)*len6
          jiw1 = istor(j1)
          jiw2 = istor(j1+1)
          jipump=istor(j1+2)
          xajun =rstor(j1+5)
          xzjun =rstor(j1+6)
          xhp =rstor(j1+22)
          xajunt=rstor(j1+28)
          xpjun =rstor(j1+29)
          joljun=istor(j1+66)
          xxp =rstor(j1+21)
          xwgj =rstor(j1+80)
          xwlj =rstor(j1+81)
          xhpl =rstor(j1+84)
          xhpg =rstor(j1+85)
          xhpflo=rstor(j1+89)
          call ptrm9u(cwpm, nlink,rstor(j1+ 4))
          call ptrm9u(chpm, nlink,rstor(j1+22))
          call ptrm9u(cpjunm,nlink,rstor(j1+29))
          if (iprt.ne.0) then
              write(dbg,204) jiw1,jiw2,jipump,joljun
              call gtrm9u(cwpm, nlink,wpm)
              call gtrm9u(chpm, nlink,hpm)
              call gtrm9u(cpjunm,nlink,pjunm)
              write(dbg,205) xajun,xzjun,xhp,xajunt,xpjun
+              ,xxp,xwgj,xwlj,xhpl,xhpg,xhpflo

```

```

x          ,wpm,hpm,pjunm
505      endif
          continue
c          if (iprt.ne.0) then
          write(dbg,22)
          write(dbg,5053) olvoln(k)
          endif
          endif
c
COM      END OF GET BRANCH IS SET BRANCH EXIT
          endif
101      continue
c
COM      END OF LOOP 101
          endif
100      continue
c
COM      =====
COM      -DUMP THE COMMON BLOCK
COM      =====
c
          if (iprt.ne.0) call dumpco
c
COM      -----
COM      -EXIT BRANCH
COM      -----
c
9999     continue
          return
22      format(1H)
99      format(/, '---SUBROUTINE-TDV-----')
198     format(' IDJUN =', I8, ' LEN6 =', I8)
202     format(' ---ERROR---COULD NOT FIND JUNCTION FOR TDV VOL.#', I8)
203     format(' POINTER=', I7, ' JUNCTION=', I7, ' VOLUMES ', I7,
x         OLJUNN=', I7)
204     format(
x         /, ' F6 LOC.1 IW1 =', I7
x         /, ' F6 LOC.2 IW2 =', I7
x         /, ' F6 LOC.3 IPUMP =', I7
x         /, ' F6 LOC.67 OLJUNN=', I7
x         )
205     format(
x         /, ' F6 LOC.6 AJUN =', 1PE12.5
x         /, ' F6 LOC.7 ZJUN =', 1PE12.5
x         /, ' F6 LOC.23 HP =', 1PE12.5
x         /, ' F6 LOC.29 AJUNT =', 1PE12.5
x         /, ' F6 LOC.30 PJUN =', 1PE12.5
x         /, ' F6 LOC.22 XP =', 1PE12.5
x         /, ' F6 LOC.81 WGJ =', 1PE12.5
x         /, ' F6 LOC.82 WLJ =', 1PE12.5
x         /, ' F6 LOC.85 HPL =', 1PE12.5
x         /, ' F6 LOC.86 HPG =', 1PE12.5
x         /, ' F6 LOC.90 HPFLOW=', 1PE12.5
x         /, ' F6 LOC. 5 WPM =', 1PE12.5
x         /, ' F6 LOC.23 HPM =', 1PE12.5
x         /, ' F6 LOC.30 PJUNM =', 1PE12.5
x         )
206     format(/, ' JUNCTION QUANTITES TDV#', I7, ' JUNCTION#', I7)

```

```

301     format(
x         /, ' F5 PTR K=', I7
x         /, ' F5 IREAD VOL =', I5
x         /, ' F2 NTDV #TDVS=', I5
x         /, ' F2 NVOL=', I5
x         /, ' NUM=', I5
x         /, ' OLVOLN(K) =', I5
x         )
302     format(' F33 IIR TABLE POSITIO=', 10I8)
303     format(' F33 IDXTVT PTRS TABLE=', 10I8)
304     format(' F33 TIME TABLE=', 10(1PE11.4))
305     format(' F33 PRESSURE TABLE=', 10(1PE11.4))
306     format(' F33 TEMPERATURE TABLE=', 10(1PE11.4))
307     format(' F33 QUALITY TABLE=', 10(1PE11.4))
308     format(' F33 MIX LEVEL TABLE=', 10(1PE11.4))
309     format(/, ' =====TABLES HAVE BEEN CHANGED =====TDV=====')
401     format(' TDV PROBLEM TIME=', 1PE12.5, ' ISTRT=', I4)
5001    format(' K, KI, OLVOLN(K), LNK(KI) ', 4I7)
5052    format(' OLVOLN(K) =', I5, /
x         /, ' ====='
x         /, ' END SET TDV DATA'
x         /, ' ====='
x         /, ' )
5053    format(' OLVOLN(K) =', I5, /
x         /, ' ====='
x         /, ' END GET TDV DATA'
x         /, ' ====='
x         /, ' )
          end
*AF
*DK PTRFGT
          subroutine ptrfgt (cbid,tt,val)
c
c          subroutine ptrfgt alters the function generator table for a
c          specified FNG control block. the paired values currently found
c          at table entry 2 are moved to table position 1. the new pair is
c          inserted at location 2.
c
c      NOTE:
c          all units conversion is presumed to be within the domain of the
c          calling procedure
c
c          ptrfgt is called by subroutine stlink
c
c          cbid = retran control block id (input)
c          tt = new time entry (input)
c          val = new table value corresponding to time tt (input)
c
c          integer cbid
c          real tt, val
c
*CA BKCM
*CA ID13
*CA ID35
*CA ID53
*CA ID54
c
          DIMENSION JTYPE(20)
          DATA JTYPE /4HDLY ,4HLG ,4HINT ,4HFNG ,4HLLG ,4HSUM ,4HVLM ,
x          3HOUT, 3HMUL, 3HDIV, 3HDER, 3HMAX, 3HMIN, 3HXPO, 2HLN,
x          5*1H /
c

```

```

integer fng
data fng /4HFNG /
c
i54 = filidx(54)
nci = istor(i54)
ncb = istor(i54+1)
c
i1 = i54+nci
i2 = i1+ncb-1
do 100 i=i1,i2
id = idc(i)
if (idcedt(id).ne.cbid) go to 100
if (jtype(itype(id)).ne.FNG) then
c. error... control block type is not FNG
write(6,11) jtype(itype(id))
stop 'ptrfgt'
endif
n = inc2(id)
if (iabs(narea(n)).lt.2) then
c. error... table is not of sufficient length
write(6,21) iabs(narea(n))
stop 'ptrfgt'
endif
idx = idxare(n)
c. move table entry 2 to entry 1 slot
tarea(idx) = tarea(idx+2)
tarea(idx+1) = tarea(idx+3)
c. move new data into slot 2
tarea(idx+2) = tt
tarea(idx+3) = val
go to 200
100 continue
c. error... block id not found
write(6,31) cbid
stop 'ptrfgt'
200 continue
c.
return
11 format(/,40('*'),/, ' ERROR... control block not type FNG',
+ ' type=',a4,/,40('*')/)
21 format(/,40('*'),/, ' ERROR... FNG table not of sufficient',
+ ' length length=',i5,/,40('*')/)
31 format(/,40('*'),/, ' ERROR... control block id not found',
+ ' id=',i5,/,40('*')/)
end
*AF
*DK GTRFGT
subroutine gtrfgt (cbid,tt,val)
c
c subroutine gtrfgt retrieves the function generation table for a
c FNG control block
c
c NOTE:
c all units conversion is presumed to be within the domain of the
c calling procedure
c
c cbid = retran control block id (input)
c tt = array of time values (output)
c val = array of table values for corresponding tt values (output)
c

```

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```

integer cbid
dimension tt(*), val(*)
c
*CA BKCM
*CA ID13
*CA ID35
*CA ID53
*CA ID54
c
DIMENSION JTYPE(20)
DATA JTYPE /4HDLY ,4HLAG ,4HINT ,4HFNG ,4HLLG ,4HSUM ,4HVLM ,
* 3HOUT ,3HMUL ,3HDIV ,3HDER ,3HMAX ,3HMIN ,3HXPO ,2HLN ,
* 5*1H /
c
integer fng
data fng /4HFNG /
c
i54 = filidx(54)
nci = istor(i54)
ncb = istor(i54+1)
c
i1 = i54+nci
i2 = i1+ncb-1
do 100 i=i1,i2
id = idc(i)
if (idcedt(id).ne.cbid) go to 100
if (jtype(itype(id)).ne.FNG) then
c. error... control block type is not FNG
write(6,11) jtype(itype(id))
stop 'gtrfgt'
endif
n = inc2(id)
nn = iabs(narea(n))
if (nn.lt.1) then
c. error... table is not of sufficient length
write(6,21) nn
stop 'gtrfgt'
endif
idx = idxare(n)
do 10 k = 1,nn
tt(k) = tarea(idx+2*(k-1))
val(k) = tarea(idx+2*k-1)
10 continue
go to 200
100 continue
c. error... block id not found
write(6,31) cbid
stop 'gtrfgt'
200 continue
c.
return
11 format(/,40('*'),/, ' ERROR... control block not type FNG',
+ ' type=',a4,/,40('*')/)
21 format(/,40('*'),/, ' ERROR... FNG table not of sufficient',
+ ' length length=',i5,/,40('*')/)
31 format(/,40('*'),/, ' ERROR... control block id not found',
+ ' id=',i5,/,40('*')/)
end
*AF
*DK GTRCBO

```

```

subroutine gtrcbo (cbid, ccout)
C
C subroutine gtrcbo retrieves the current output assigned to a
C specified control block
C
C NOTE:
C all units conversion is presumed to be within the domain of the
C calling procedure
C
C gtrcbo is called by subroutine stlink
C
C cbid = retran control block id          (input)
C ccout = current controller output      (output)
C
C integer cbid
C real xinput, ccout
C
*CA BKCM
*CA ID13
*CA ID35
*CA ID53
*CA ID54
C
i54 = filidx(54)
nci = istor(i54)
ncb = istor(i54+1)
C
i1 = i54+nci
i2 = i1+ncb-1
do 100 i=i1,i2
id = idc(i)
if (idcedt(id).ne.cbid) go to 100
ccout = cout(id)
go to 200
100 continue
C. error... block id not found
write(6,31) cbid
stop 'gtrcbo'
200 continue
C.
return
31 format(//,40('*'),/, ' ERROR... control block id not found',
+ ' id=',i5,/,40('*')/)
end
*AF
*DK TDVERR
logical function tdverr (dummy)
C
C make sure all tdv links are satisfied by retran data
C
C logical match
*CA BKCM
*CA ID02
*CA ID05
*CA /MRCLST/
*CA /MININT/
*CA /MRVDAT/
C
C
C idx02 = filidx(02)

```

```

idx05 = filidx(05)
io5s = setsiz(5)
io5e = idx05+(nvol(idx02)-1)*io5s
num = 0
tdverr = .FALSE.
do 200 l = 1, lnkmax
call gtim9u(clnk,l,lnk)
call gtim9u(cntd,l,ntd)
if (ntd.gt.0 .and. (lnk.eq.1 .or. lnk.eq.3) ) then
match = .FALSE.
k = idx05-io5s
do while (.not.match .and. k.lt.io5e)
k = k+io5s
if (ntd.eq.0ivoln(k)) match = .TRUE.
enddo
if (.not.match) then
tdverr = .TRUE.
write(6,11) ntd
endif
endif
200 continue
C
return
11 format('>>>ERROR... RETRAN Time Dependent Volume ',i5,
+ ' not found.')
end
*AF
*DK SECOND
subroutine second( tym )
common /cloxx/ tim0
integer*4 tim0
real*8 tym
integer*4 vtim0, vt, tt
C
if (tym.eq.-999.) then
C -initialize the run-time clock
call vtime(vtim0, tim0)
tym = 0.0
else
C -compute elapsed time
call vtime(vt,tt)
tym = 0.01*float(tt- tim0)
endif
C
return
end
*ID RTMNO590
*D RMAIN.2 RMAIN
program main
C
C this procedure has been added to force an ordering of the data
C blocks accessed by RETRAN. DATA1, DATA2 and DATA3 do not alter
C the functioning of this code in any way.
call data1
call data2
call data3
C
C enter RETRAN main program
CALL RMAIN

```

c
 stop
 end
 subroutine datam
 c MINET common data area
 common / NDAB9U/ NDAB9U
 common / ICHR9U/ ICHR9U
 common / HCHR9U/ HCHR9U
 common / GC9U / GC9U
 common / GCNM9U/ GCNM9U
 common / MDAB9U/ MDAB9U
 common / LDAB9U/ LDAB9U
 common / UNIT3I/ UNIT3I
 common / SNET3P/ SNET3P
 common / VOL3P / VOL3P
 common / TURB3P/ TURB3P
 common / HX3P / HX3P
 common / PUMP3P/ PUMP3P
 common / MODC3P/ MODC3P
 common / VALV3P/ VALV3P
 common / MODL3P/ MODL3P
 common / TIME3V/ TIME3V
 common / TIME3I/ TIME3I
 common / UNIT9U/ UNIT9U
 common / SATM3V/ SATM3V
 common / DATC9 / DATC9
 common / DATI9 / DATI9
 common / DATV9 / DATV9
 common / ADAB9U/ ADAB9U
 common / TIME3P/ TIME3P
 common / SCRH3R/ SCRH3R
 common / SCRH9I/ SCRH9I
 common / UNID9I/ UNID9I
 common / MOD3I / MOD3I
 common / MOD3V / MOD3V
 common / NODE3I/ NODE3I
 common / NODE3V/ NODE3V
 common / SATP3V/ SATP3V
 common / SAVE / SAVE
 common / ISUV9R/ ISUV9R
 common / LNKS3I/ LNKS3I
 common / ORD3I / ORD3I
 common / ITERP / ITERP
 common / VD9V / VD9V
 common / IMNRRAN/ IMNRRAN
 common / RMNRRAN/ RMNRRAN
 common / PMNRRAN/ PMNRRAN
 common / IMNINT/ IMNINT
 common / RMNINT/ RMNINT
 common / SAVER / SAVER
 common / LOCAL / LOCAL
 common / GLOB3I/ GLOB3I
 common / GLOB3V/ GLOB3V
 common / NODL3P/ NODL3P
 common / SEG3P / SEG3P
 common / NET3P / NET3P
 common / BC3P / BC3P
 common / LNK3P / LNK3P
 common / DCON9U/ DCON9U
 common / TRND3P/ TRND3P

```

common / EXTRA / EXTRA
common / BRITSC/ BRITSC
return
end
subroutine data1
c RETRAN common data area
common / FTB / FTB
common / WATC / WATC
common / TOLP / TOLP
common / HTCBLK/ HTCBLK
common / CLOXX / CLOXX
common blkcom
return
end
subroutine data2
return
end
subroutine data3
c RETRAN 'blank' common data area- marker
common /blkcm/ blkcm
return
end
C-----begin BNL code modification-----
ccc PROGRAM RMAIN
subroutine rmain
C-----end BNL code modification-----
*D RMAIN.3499 RMAIN
C-----begin RETRAN/MINET code modification-----
COM
COM =====
COM DEFINITIONS OF MINRAN COMMON
COM =====
COM LNKMAX = MAXIMUM NUMBER OF LINK INPUT CARDS BETWEEN MINET AND RETR
COM IF LNKMAX.EQ.0 ONLY RETRAN IS EXECUTED.
COM LNK(I) = TYPE OF LINK (1=TDV) (2=FULL) (3=BOTH) (OTHER=NO LINK)
COM LNK(I) = ANY EXCEPT (1,2,3) DE-COUPLES THE RETRAN-MINET CALCULATIO
COM AND RUNS BOTH CODES INDEPENDENTLY AT THE LINK JUNCTION.
COM IF ALL LNK(I) ARE NOT (1,2,3), THEN BOTH CODES OPERATE
COM AS STAND-ALONE MODULES.
COM IF LNK(1) IS NEGATIVE, ONLY RETRAN EXECUTES, BUT A DUMMY
COM MINET INPUT DECK IS STILL REQUIRED.
COM NTD(I) = RETRAN INPUT VOLUME NUMBER
COM MTD(I) = MINET INPUT VOLUME NUMBER
COM NFIL(I)= RETRAN INPUT JUNCTION NUMBER
COM MFIL(I)= MINET INPUT JUNCTION NUMBER
COM GET TDV PARAMETERS (FROM RETRAN)
COM WPM = RETRAN JUNCTION WEIGHT FLOW TO PUT IN MINET
COM HPM = RETRAN JUNCTION ENTHALPY TO PUT IN MINET
COM PJUNM = RETRAN JUNCTION PRESSURE TO PUT IN MINET
COM SET TDV PARAMETERS (TO RETRAN)
COM PTABL = MINET PRESSURE TO PUT IN RETRAN TDV
COM TTABL = MINET TEMPERATURE TO PUT IN RETRAN TDV
COM XTABL = MINET QUALITY TO PUT IN RETRAN TDV

```

```

COM ZTBLM = MINET LEVEL TO PUT IN RETRAN TDV (DOES NOT EXIST)
COM ZVOLM = RETRAN MAX. LEVEL TO PUT IN RETRAN TDV (FOR ZTBLM )
COM
COM GET FILL PARAMETERS (FROM RETRAN)
COM PM = RETRAN VOLUME PRESSURE TO PUT IN MINET
COM HWM = RETRAN VOLUME SPECIFIC ENTHALPY TO PUT IN MINET
COM ZMM = RETRAN VOLUME MIXTURE LEVEL TO PUT IN MINET
COM AVEXM = RETRAN VOLUME AVERAGE QUALITY TO PUT IN MINET
COM
COM SET FILL PARAMETERS (TO RETRAN)
COM FILTBM = MINET FILL JUNCTION FLOW/A TO PUT IN RETRAN
COM FILENM = MINET FILL JUNCTION ENTHALPY TO PUT IN RETRAN
COM FILPRM = MINET FILL JUNCTION PRESSURE TO PUT IN RETRAN
COM AJUNTM = RETRAN FILL JUNCTION AREA = A TO MAKE FLOW/A
COM
COM TIMNEM = PROBLEM TRANSIENT TIME (FROM RETRAN)
COM TIMOLM = PREVIOUS TRANSIENT TIME (FROM RETRAN)
COM DELTM = TIME-TIMOLM (FROM RETRAN)
COM ISTRT = DEBUG PRINT COUNTER (FROM RETRAN)
COM
COM
C<-----end RETRAN/MINET code modification-----
C
*D RMAIN.3509,RMAIN.3512 RMAIN
C
C>-----begin RETRAN/MINET code modification-----
*CA /MININT/
common /saver/ init
C<-----end RETRAN/MINET code modification-----
C
LOGICAL FRST, LAST
DATA FRST, LAST / .TRUE., .FALSE. /
C
C>-----begin RETRAN/MINET code modification-----
  istr = 1
  init = 0
  iprt = 0
  call second(-999.0)
C<-----end RETRAN/MINET code modification-----
C
C>-----begin BNL code modification-----
c -enter system request for jobstop processing
  ifrm = kmand ('exec jobstop ready')
C
ccc CALL REMARK(' ENTERED DRIVER RMAIN')
  CALL REMARK(' ENTERED DRIVER RMAIN ')
C<-----end BNL code modification-----
*D RMAIN.3531,RMAIN.3534 RMAIN
C>-----begin BNL code modification-----
ccc CALL LOGO
C
ccc CALL REMARK(' CALL SEGMENT INPUT')
  CALL REMARK(' CALL SEGMENT INPUT ')
C<-----end BNL code modification-----
  CALL INPUT (FRST, LAST, NCASE, IGO)
  SETSIZ(1) = NCASE
C
C>-----begin RETRAN/MINET code modification-----
  call minrd
C<-----end RETRAN/MINET code modification-----

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```

C
*D RMAIN.3561,RMAIN.3562 RMAIN
C>-----begin BNL code modification-----
ccc CALL REMARK(' STOP *** RMAIN ***')
  CALL REMARK(' STOP *** RMAIN *** ')
C
ccc STOP
  return
C
C<-----end BNL code modification-----
*D EDIT.263 EDIT
C
C>-----begin RETRAN/MINET code modification-----
ccc IF (PLTC.OR.LABL) CALL PLTAPE (IUNIT, LABL)
  IF (PLTC.OR.LABL) then
    CALL PLTAPE (IUNIT, LABL)
    call svcx3u
  endif
C<-----end RETRAN/MINET code modification-----
C
*D RETRAN.12 RETRAN
C>-----begin BNL code modification-----
ccc CALL REMARK(' EXECUTE MODULE RETRAN')
  CALL REMARK(' EXECUTE MODULE RETRAN ')
C<-----end BNL code modification-----
*D RETRAN.16 RETRAN
C>-----begin BNL code modification-----
ccc CALL REMARK(' CALL SEGMENT INRTRN')
  CALL REMARK(' CALL SEGMENT INRTRN ')
C<-----end BNL code modification-----
*D RETRAN.21 RETRAN
C>-----begin BNL code modification-----
ccc CALL REMARK(' CALL SEGMENT STATIC')
  CALL REMARK(' CALL SEGMENT STATIC ')
C<-----end BNL code modification-----
*D RETRAN.24 RETRAN
C>-----begin BNL code modification-----
ccc50 CALL REMARK(' CALL SEGMENT STSTAT')
  50 CALL REMARK(' CALL SEGMENT STSTAT ')
C<-----end BNL code modification-----
*D RETRAN.29 RETRAN
C>-----begin BNL code modification-----
ccc CALL REMARK(' EXECUTE MODULE RESTRT')
  CALL REMARK(' EXECUTE MODULE RESTRT ')
C<-----end BNL code modification-----
*D RETRAN.32 RETRAN
C>-----begin BNL code modification-----
ccc CALL REMARK(' CALL SEGMENT INRSTR')
  CALL REMARK(' CALL SEGMENT INRSTR ')
C<-----end BNL code modification-----
*D RETRAN.37 RETRAN
C>-----begin BNL code modification-----
ccc CALL REMARK(' CALL SEGMENT STSTAT')
  CALL REMARK(' CALL SEGMENT STSTAT ')
C<-----end BNL code modification-----
*D RETRAN.40 RETRAN
C>-----begin BNL code modification-----
ccc75 CALL REMARK(' CALL SEGMENT CPYPLT')
  75 CALL REMARK(' CALL SEGMENT CPYPLT ')
C<-----end BNL code modification-----

```

```

*D RETRAN.45,RETRAN.50      RETRAN
C
C>-----begin RETRAN/MINET code modification-----
CC100 IF(.NOT. LSTOR(FILIDX(7))) CALL REDUCE(LEN,0,1 )
      100 continue
C<-----end RETRAN/MINET code modification-----
C
C
C>-----begin BNL code modification-----
ccc  CALL REMARK(' CALL SEGMENT TRAN')
      CALL REMARK(' CALL SEGMENT TRAN  ')
C<-----end BNL code modification-----
      CALL TRAN (JUNIT)
C
C>-----begin BNL code modification-----
ccc  CALL REMARK(' CALL SEGMENT PRNPLT')
      CALL REMARK(' CALL SEGMENT PRNPLT  ')
C<-----end BNL code modification-----
*I STSTAT.33      STSTAT
C
C>-----begin RETRAN/MINET code modification-----
*CA ID40
      integer dbg
      common / local / i5,ms5,is5
*CA /MRCLST/
*CA /MRVDAT/
      data dbg/22/
C<-----end RETRAN/MINET code modification-----
C
*D STSTAT.64      STSTAT
*D STSTAT.72      STSTAT
C>-----begin BNL code modification-----
ccc  CALL REMARK(' ENTERED SEGMENT STSTAT')
      CALL REMARK(' ENTERED SEGMENT STSTAT ')
C<-----end BNL code modification-----
*I STSTAT.74      STSTAT
C
C>-----begin RETRAN/MINET code modification-----
      lsq = filidx(07)
C<-----end RETRAN/MINET code modification-----
C
*D STSTAT.148      STSTAT
C>-----begin BNL code modification-----
ccc40 CALL REMARK(' CALL SEGMENT INITLZ')
      40 CALL REMARK(' CALL SEGMENT INITLZ  ')
C<-----end BNL code modification-----
*I STSTAT.151      STSTAT
C
C>-----begin RETRAN/MINET code modification-----
      kount = 0
      iget=1
      iset=2
      time=time*(lsq)
      if (time.eq.0.0 ) then
          timolm = 0.0
          deltm = 0.0
      endif
      if (time.ne.timnem) then
          deltm = time-timnem
          timolm = timnem

```

```

endif
timnem = time
C
call gtim9u(clnk,+1,lnk1)
if(lnk1.lt.0) write(dbg,1788)
C
if(jsst(i2).eq.0) go to 6000
idx02=filidx(02)
idx06=filidx(06)
idx40=filidx(40)
isiz06=setsiz(06)
njun1 =njun(idx02)
inpsi =ixnpsi(idx40)
mjunf1=mjunf(idx40)
C
COM =====
COM GET PARAMETERS FROM RETRAN STEADY  CALCULATION
COM TO PASS TO MINET STEADY  CALCULATION
COM =====
C
if (iprt.ne.0) write(dbg,1702)
C
COM -----
COM LOOP OVER FILL JUNCTIONS (IF ANY)
COM -----
C
if (mjunf1.le.njun1) then
do 1880 jun=mjunf1,njun1
    ipsi = npsi(inpsi+jun-1)
    i = idx06 + (ipsi-1)*isiz06
C
    call fillm(i,iget)
C
1880 continue
endif
if (iprt.ne.0) then
write(dbg,1703)
write(dbg,705) iter
endif
C
if(ntdv(idx02).gt.0) call tdv(iget)
C
COM =====
COM FIRST REAL CALL TO STLINK
COM MINET STEADY  LINK CALLED
COM MINET STEADY  CALCULATION
COM PARAMETERS PASSED THROUGH COMMON MINRAN
COM =====
C
if (iprt.ne.0) write(dbg,1603)
C
call stlink(0)
C
COM =====
COM SET PARAMETERS FOR RETRAN STEADY  CALCULATION
COM THEY CAME FROM MINET STEADY  CALCULATION
COM =====
C
if (iprt.ne.0) write(dbg,2702)
C

```

```

COM -----
COM LOOP OVER FILL JUNCTIONS (IF ANY)
COM -----
C
  if (mjunf1.le.njun1) then
    do 2880 jun=mjunf1,njun1
      ipsi = npsi(inpsi+jun-1)
      i = idx06 + (ipsi-1)*isiz06
    c
      call fillm(i,iset)
    c
  2880 continue
  endif
  if (iprt.ne.0) then
    write(dbg,2703)
    write(dbg,705) iter
  endif
c
  if(ntdv(idx02).gt.0) call tdv(iset)
C
6000 continue
C
1601 format(/, ' =====
X      /, ' STLINK CALL FROM STSTAT TO INITIALIZE COMMON ',
X      /, ' =====
1603 format(/, ' =====
X      /, ' STLINK CALL FROM STSTAT TO GET LINK PARAMETERS ',
X      /, ' =====
1702 format(/, ' =====
X      /, ' FILLM CALLS FROM STSTAT WITH OR WITHOUT JSST=1 GET=1'
1703 format(/, ' TDV CALLS FROM STSTAT WITH OR WITHOUT JSST=1 GET=1',
X      /, ' =====
1788 format(/, ' =====
X      /, ' NEGATIVE LNK(1) - NO MINET EXECUTION
X      /, ' =====
2702 format(/, ' =====
X      /, ' FILLM CALLS FROM STSTAT WITH OR WITHOUT JSST=1 SET=2'
2703 format(/, ' TDV CALLS FROM STSTAT WITH OR WITHOUT JSST=1 SET=2',
X      /, ' =====
c<-----end RETRAN/MINET code modification-----
C
*I STSTAT.346 STSTAT
C
c>-----begin RETRAN/MINET code modification-----
C
  kount = kount + 1
C
  idx02=filidx(02)
  idx06=filidx(06)
  idx40=filidx(40)
  isiz06=setsiz(06)
  njun1 =njun(idx02)
  inpsi =ixnpsi(idx40)
  mjunf1=mjunf(idx40)
  if (iprt.ne.0) then
    write(dbg,702)
    write(dbg,705) iter
  endif
C
COM -----

```

```

COM LOOP OVER FILL JUNCTIONS (IF ANY)
COM -----
C
  if (mjunf1.le.njun1) then
    do 880 jun=mjunf1,njun1
      ipsi = npsi(inpsi+jun-1)
      i = idx06 + (ipsi-1)*isiz06
    c
      call fillm(i,iget)
    c
  880 continue
  endif
  if (iprt.ne.0) then
    write(dbg,703)
    write(dbg,705) iter
  endif
C
  if (ntdv(idx02).gt.0) call tdv(iget)
C
COM =====
COM STEADY STATE ITERATION CALLS
COM MINET STEADY LINK CALLED
COM MINET STEADY CALCULATION
COM PARAMETERS PASSED THROUGH COMMON MINRAN
COM =====
C
  if (iprt.ne.0) write(dbg,1606)
C
  call stlink(0)
C
COM =====
COM SET PARAMETERS FOR RETRAN STEADY CALCULATION
COM THEY CAME FROM MINET STEADY CALCULATION
COM =====
C
  if (iprt.ne.0) write(dbg,3702)
C
COM -----
COM LOOP OVER FILL JUNCTIONS (IF ANY)
COM -----
C
  if (mjunf1.le.njun1) then
    do 3880 jun=mjunf1,njun1
      ipsi = npsi(inpsi+jun-1)
      i = idx06 + (ipsi-1)*isiz06
    c
      call fillm(i,iset)
    c
  3880 continue
  endif
  if (iprt.ne.0) then
    write(dbg,3703)
    write(dbg,705) iter
  endif
C
  if (ntdv(idx02).gt.0) call tdv(iset)
C
  if (jsst(i2).eq.0.and.kount.lt.1) go to 50
C
  702 format( ' FILLM CALLS FROM STSTAT GET=1',

```

```

X      /, ' ====='
703 format( /, ' TDV  CALLS FROM STSTAT  GET=1',
X      /, ' =====' )
705 format( ' ITER =', I4)
1606 format( /, ' ====='
X      /, ' STLINK CALL FROM STSTAT  STEADY STATE ITERATION ',
X      /, ' =====' )
3702 format( /, ' FILLM CALLS FROM STSTAT  SET=2',
X      /, ' =====' )
3703 format( /, ' TDV  CALLS FROM STSTAT  SET=2',
X      /, ' =====' )
C<-----end RETRAN/MINET code modification-----
C
*D STSTAT.395      STSTAT
C>-----begin BNL code modification-----
ccc100 CALL REMARK(' CALL SEGMENT JVEDIT')
100  CALL REMARK(' CALL SEGMENT JVEDIT  ')
C<-----end BNL code modification-----
*D STSTAT.436      STSTAT
C>-----begin BNL code modification-----
ccc  CALL REMARK(' CALL SEGMENT JVEDIT')
    CALL REMARK(' CALL SEGMENT JVEDIT  ')
C<-----end BNL code modification-----
*D TIMINT.12,TIMINT.18      TIMINT
*CA BKCM                                T
    EQUIVALENCE (ITIME,CPU)
*CA ID02                                T
*CA ID07                                T
    REAL NEXTID
    REAL IA(21)
    DIMENSION INOUT(21)
C>-----begin RETRAN/MINET code modification-----
    integer pageno
C<-----end RETRAN/MINET code modification-----
*D TIMINT.145,TIMINT.146      TIMINT
C>-----begin RETRAN/MINET code modification-----
ccc  IF (CPU.LT.CPUSAV) IPAGE = 0
    ipage = pageno(+0)
    IPAGE = IPAGE + 1
    ipage = pageno(ipage)
C<-----end RETRAN/MINET code modification-----
*D TRAN.22,TRAN.24      TRAN
    REAL MESSAGE(3,16)
C
C>-----begin RETRAN/MINET code modification-----
*CA ID40
*CA /MININT/
    integer dbg
    data dbg/22/
C<-----end RETRAN/MINET code modification-----
C
*D TRAN.45      TRAN
*D TRAN.48      TRAN
C>-----begin BNL code modification-----
ccc  CALL REMARK(' ENTERED SEGMENT TRAN')
    CALL REMARK(' ENTERED SEGMENT TRAN  ')
C<-----end BNL code modification-----
*I TRAN.102      TRAN
C
C>-----begin RETRAN/MINET code modification-----

```

```

time=timex(lsq)
if (time.eq.0.0 ) then
    timolm = 0.0
    deltm = 0.0
endif
if (time.ne.timnem) then
    deltm = time-timnem
    timolm = timnem
endif
timnem=time
if (iprt.ne.0) then
    write(dbg,604)
    write(dbg,605) timex(lsq)
endif
C
604 format(/, ' PRESUR CALL DELTM=0 TRAN',
X      /, ' =====' )
605 format(' TIMEX(LSQ)=' ,IPE12.5)
C<-----end RETRAN/MINET code modification-----
C
*D TRAN.170      TRAN
C>-----begin RETRAN/MINET code modification-----
    iget=1
    iset=2
    time=timex(lsq)
    if (time.eq.0.0 ) then
        timolm = 0.0
        deltm = 0.0
    endif
    if (time.ne.timnem) then
        deltm = time-timnem
        timolm = timnem
    endif
    timnem=time
    idx02=filidx(02)
    idx06=filidx(06)
    idx40=filidx(40)
    isiz06=setsiz(06)
    njun1 =njun(idx02)
    inpsi =ixnpsi(idx40)
    mjunf1=mjunf(idx40)
C
COM =====
COM GET PARAMETERS FROM RETRAN TRANSIENT CALCULATION
COM TO PASS TO MINET TRANSIENT CALCULATION
COM =====
C
if (iprt.ne.0) then
    write(dbg,602)
    write(dbg,605) timex(lsq)
endif
C
COM -----
COM LOOP OVER FILL JUNCTIONS (IF ANY)
COM -----
C
if (mjunf1.le.njun1) then
    do 880 jun=mjunf1,njun1
        ipsi = npsi(inpsi+jun-1)
        i = idx06 + (ipsi-1)*isiz06

```

```

C      call fillm(i,iget)
C
C      880  continue
C      endif
C      if (iprt.ne.0) then
C          write(dbg,603)
C          write(dbg,605) timex(1sq)
C      endif
C
C      if (ntdv(idx02).gt.0) call tdv(iget)
C
C      =====
C      COM  MINET TRANSIENT LINK CALLED
C      COM  MINET TRANSIENT CALCULATION
C      COM  PARAMETERS PASSED THROUGH COMMON MINRAN
C      COM  =====
C
C      if (iprt.ne.0) write(dbg,1601)
C
C      call stlink(1)
C
C      =====
C      COM  SET PARAMETERS FOR RETRAN TRANSIENT CALCULATION
C      COM  THEY CAME FROM MINET TRANSIENT CALCULATION
C      COM  =====
C
C      if (iprt.ne.0) then
C          write(dbg,1602)
C          write(dbg,605) timex(1sq)
C      endif
C
C      -----
C      COM  LOOP OVER FILL JUNCTIONS (IF ANY)
C      COM  -----
C
C      if (mjunf1.le.njun1) then
C          do 1880 jun=mjunf1,njun1
C              ipsi = npsi(inpsi+jun-1)
C              i    = idx06 + (ipsi-1)*isiz06
C
C              call fillm(i,iset)
C
C      1880  continue
C      endif
C      if (iprt.ne.0) then
C          write(dbg,1603)
C          write(dbg,605) timex(1sq)
C      endif
C
C      if(ntdv(idx02).gt.0) call tdv(iset)
C
C      =====
C      COM  6 MAY 87 - NO SUBSTITUTE FOR TAPEBC NECESSARY EITHER
C      COM  HERE OR IN INVOL,PRESUR, OR RESOPT.
C      COM  TAPEBC READS A RETRAN DATA TAPE TO GET MTDV SETS OF
C      COM  PREVIOUSLY CALCULATED VOLUME QUANTITIES. FILE 42 IS
C      COM  CREATED FROM DATA ON THE TAPE AND CONTAINS
C      COM  TIMNEM      TIMOLM
C      COM  POWNEW     POWOLD

```

```

COM  IVOLN = VOL. NUMBER OF VOL. DATA RETRIEVED (MTDV SUBFILES)
COM  PNEW      POLD
COM  TNEW      TOLD
COM  XNEW      XOLD
COM  ZNEW      ZOLD
COM  AS SEQUENTIAL DATA ON THE DATA TAPE. WE DO NOT PERMIT
COM  ANY OF THESE OLD SUBFILES VOLUME HISTORIES TO BE THE COUPLING
COM  VOLUME BETWEEN RETRAN AND MINET. WE MUST ALWAYS SPECIFY
COM  A COUPLING VOLUME AS CARD INPUT WITH DUMMY DATA.
COM  -----
C
C      602 format(/,' FILLM CALLS FROM TRAN GET SEQUENCE',
C          X      /,' =====')
C      603 format(/,' TDV  CALLS FROM TRAN GET SEQUENCE',
C          X      /,' =====')
C      1601 format(/,' =====',
C          X      /,' STLINK CALL FROM TRAN TO GET LINK PARAMETERS',
C          X      /,' =====')
C      1602 format(/,' FILLM CALLS FROM TRAN SET SEQUENCE',
C          X      /,' =====')
C      1603 format(/,' TDV  CALLS FROM TRAN SET SEQUENCE',
C          X      /,' =====')
C<-----end RETRAN/MINET code modification-----
C

```

5. LISTINGS OF REVISED AND NEW SUBROUTINES

program main

c this procedure has been added to force an ordering of the data
c blocks accessed by RETRAN. DATA1, DATA2 and DATA3 do not alter
c the functioning of this code in any way.

call data1
call datam
call data2
call data3

c
c enter RETRAN main program
CALL RMAIN

c
c stop
end

subroutine datam

c MINET common data area

common / NDAB9U/ NDAB9U
common / ICHR9U/ ICHR9U
common / HCHR9U/ HCHR9U
common / GC9U / GC9U
common / GCNM9U/ GCNM9U
common / MDAB9U/ MDAB9U
common / LDAB9U/ LDAB9U
common / UNIT3I/ UNIT3I
common / SNET3P/ SNET3P
common / VOL3P / VOL3P
common / TURB3P/ TURB3P
common / HX3P / HX3P
common / PUMP3P/ PUMP3P
common / MODC3P/ MODC3P
common / VALV3P/ VALV3P
common / MODL3P/ MODL3P
common / TIME3V/ TIME3V
common / TIME3I/ TIME3I
common / UNIT9U/ UNIT9U
common / SATM3V/ SATM3V
common / DATC9 / DATC9
common / DATI9 / DATI9
common / DATV9 / DATV9
common / ADAB9U/ ADAB9U
common / TIME3P/ TIME3P
common / SCRH3R/ SCRH3R
common / SCRH9I/ SCRH9I
common / UNID9I/ UNID9I
common / MOD3I / MOD3I
common / MOD3V / MOD3V
common / NODE3I/ NODE3I
common / NODE3V/ NODE3V
common / SATP3V/ SATP3V
common / SAVE / SAVE
common / ISUV9R/ ISUV9R
common / LNK3I/ LNK3I
common / ORD3I / ORD3I
common / ITERP / ITERP
common / VD9V / VD9V
common / IMNRAN/ IMNRAN

common / RMNRAN/ RMNRAN
common / PMNRAN/ PMNRAN
common / IMNINT/ IMNINT
common / RMNINT/ RMNINT
common / SAVER / SAVER
common / LOCAL / LOCAL
common / GLOB3I/ GLOB3I
common / GLOB3V/ GLOB3V
common / NODL3P/ NODL3P
common / SEG3P / SEG3P
common / NET3P / NET3P
common / BC3P / BC3P
common / LNK3P / LNK3P
common / DCON9U/ DCON9U
common / TRND3P/ TRND3P
common / EXTRA / EXTRA
common / BRITSC/ BRITSC
return
end

subroutine data1

c RETRAN common data area

common / FTB / FTB
common / WATC / WATC
common / TOLP / TOLP
common / HTCBLK/ HTCBLK
common / CLOXX / CLOXX
common blkcom
return
end

subroutine data2

return
end

subroutine data3

c RETRAN 'blank' common data area- marker

common /blkcm/ blkcm
return
end

C>-----begin BNL code modification-----

ccc PROGRAM RMAIN
subroutine rmain

C<-----end BNL code modification-----

C (INPUT=65, OUTPUT=257, TAPE40=/640, TAPE50=513,
C * TAPE60=513, TAPE81=257, TAPE5=INPUT, TAPE6=OUTPUT, DEBUG=OUTPUT)

C
C
C
C
C


```

SUBROUTINE EDIT (MAJC,MINC,PLTC,LABL,PEND,IUNIT)
SUBROUTINE EDIT IS THE DRIVER FOR MAJOR AND MINOR EDITING.
EDIT IS CALLED BY SUBROUTINES TRAN, FINISH AND EDITRE.

MAJC      = MAJOR EDIT FLAG          (INPUT)
MINC      = MINOR EDIT FLAG          (INPUT)
PLTC      = DATA TAPE WRITE FLAG    (INPUT)
LABL      = DATA TAPE LABEL WRITE FLAG (INPUT)
PEND      = END OF RUN FLAG          (INPUT)
IUNIT     = UNIT NUMBER GIVEN TO A RESTART TAPE (INPUT)

*CA BKCM
*CA ID07
*CA ID35

REAL TYP(4)
LOGICAL MAJC,MINC,PLTC,LABL,PEND,NOGOY,FIRST,LPRPLT

EQUIVALENCE (REEL, IREEL)
REAL OLDVSN
LOGICAL LSLIP, LLIQL, LPUMP, LCOND, LCORE, LKIN, LHTX
LOGICAL LDNB, LPRZ, LSTK, LTFL
LOGICAL LAUX

DIMENSION IVOL(11)
DIMENSION JUN(12)
DIMENSION ISYS (8)
DIMENSION ITST(2)

NV = NUMBER OF VOLUME EDIT PARAMETERS
IVOL = LIST OF SEQ. NUMBERS FOR NV VOLUME EDIT PARAMS. AS THEY
APPEAR IN EDATA1 - I.E., OLVOLN,P,FMASS,HW,AVED,TEMP,AVEX,BUBM,
ZM,LIQM AND INEQ
DATA NV, IVOL / 11,33,1,21,15,28,2,19,23,3,24,39 /

NJ = NUMBER OF JUNCTION EDIT PARAMETERS
JUN = LIST OF SEQ. NUMBERS FOR NJ JUNCTION EDIT PARAMS. AS THEY
APPEAR IN EDATA1 - I.E., OIJUNN,IW1,IW2,KCHOKE,ICHOKE,ITP,WP,HP,
SPVJ,DELP,DELE,DELJ,DELA, AND PUMPP
DATA NJ, JUN / 12, 14, 1, 2, 9, 3, 8, 12, 11, 5, 6, 4, 10 /

NS = NUMBER OF SYSTE EDIT PARAMETERS
ISYS = LIST OF SEQ. NUMBERS FOR NS SYSTEM EDIT PARAMS. AS THEY
APPEAR IN EDATA2 - I.E. TIMEX,PNORM,POWER,PTHERM,QLOSS,EB,
BMASSW,BMASSA
DATA NS, ISYS / 8, 12, 9, 13, 14, 10, 6, 4, 5 /

NT = NUMBER OF TIME STEP EDIT PARAMETERS
ITST = LIST OF SEQ. NUMBERS FOR NT TIME STEP EDIT PARAMS. AS THEY
APPEAR IN EDATA3 - I.E., NSTEP AND NTTSP
DATA NT, ITST / 2,7,8 /

DATA JXX /0/
DATA BLANK / 8H /

```

```

ED
ED
ED

```

```

DATA TYP / 8H      , 8H MOODY , 8HEXT-HEN , 8HISE-EXP /
DATA FIRST / .FALSE. /

CALL TIMEOUT(20)

NOGOY = LSTOR(FILIDX(7))
IF (FIRST) GO TO 200
FIRST = .TRUE.
NDELTA = 1
NEDI = ISTORE(FILIDX(02)+1)
IDXEDT = FILIDX(10)
LPRPLT = ISTORE(FILIDX(2)+1).GE.0
PRPLOT = -FILID(3)
IDX07 = FILIDX(07)
IDX35 = FILIDX(35)
NSTART = NTTSP(IDX35)
TSTART = TIMEX(IDX07)
IF (NEDI .EQ. 0) GO TO 1

PICK UP BASE ADDRESSES AND COUNTERS FOR MINOR EDITS
NEDV = SETSIZ(3)
IDXMED = FILIDX(3)
IDXMAD = IDXMED + 4*NEDV - 1
IDXMGO = IDXMAD + NEDV

COMPUTE BASE INDEX, SETSIZE AND NUMBER OF SETS FOR EACH
MAJOR EDIT ADDRESS MASK (FIRST CALL ONLY)
1 IDXPRC = FILIDX(43)
NOFILS = ISTORE(IDXPRC)
IDXADD = ISTORE(IDXPRC+1)
NSET43 = ISTORE(IDXPRC+2)
MAX = NSET43 * NOFILS
I2 = FILIDX(2)

STORE INDEX FOR LCOUNT -- USED TO STORE INDEX OF CURRENT
TIME MINOR EDIT STRING

IMG0 = SETSIZ(1)
LAUX = ISTORE(I2).EQ.-2 .AND. ISTORE(I2+4).LT.0

RESTORE VALUE OF JXX IF EDIT CALLED BY FINISH FOR CDC
APPLICATIONS - LOWER LEVEL COPY OF EDIT IS SWAPPED IN,
THUS DESTROYING DEFINITION OF LOCAL VARIABLE JXX

IF (NEDV .EQ. 0) GO TO 5
IF (IMG0 .LE. IDXMGO) GO TO 5
JXX = (IMG0 - IDXMGO + NEDV - 1)/NEDV
IDXMGO = IMG0 - 1 + NEDV
5 CONTINUE
LSLIP = ISTORE(I2+22).GT.0
LLIQL = ISTORE(I2+20).GT.0
LPUMP = ISTORE(I2+08).GT.0
LCOND = ISTORE(I2+12).GT.0
LCORE = ISTORE(I2+15).GT.0
LDNB = ISTORE(I2+27).GT.0
LKIN = ISTORE(I2+18).GE.1 .AND. ISTORE(I2+18).LE.3
LHTX = ISTORE(I2+16).GT.0
NBITS = 30
IF (.NOT.IBMRUN) GO TO 20

```

```

NBITS = 32
20 OLDVSN = BLANK
LPRZ = ISTORE(I2+25).LE.0
LSTK = ISTORE(I2+18).GE. 4
LTFL = ISTORE(I2+38).GE.1
C
C COMPUTE LOCAL INDICES FOR EDIT VARIABLES
KOUNT = 0
IDX = IDXADD
DO 100 I = 3,MAX,NSET43
IF (ISTOR(IDXPRC+I).LT.5.OR. ISTORE(IDXPRC+I).GT.7) GO TO 90
KOUNT = KOUNT + 1
IF (ISTOR(IDXPRC+I).EQ.7) GO TO 60
IF (ISTOR(IDXPRC+I).EQ.6) GO TO 30
C
C GET CONTROL VOLUME EDIT VARIABLE ADDRESSES
DO 10 K = 1,NV
10 IVOL(K) = ISTORE(IDX+IVOL(K))
NV = NV - 1
IDV = IDX
NVOL = ISTORE(IDXPRC+I+2)
IVS = SETSIZ(5)
IOLDVL = IVOL(1)
IF (KOUNT.GE.4) GO TO 200
GO TO 100
C
C GET JUNCTION EDIT VARIABLE ADDRESSES
30 DO 40 K = 1,NJ
40 JUN(K) = ISTORE(IDX+JUN(K))
IDJ = IDX
NJUN = ISTORE(IDXPRC+I+2)
IJS = SETSIZ(6)
IF (KOUNT.GE.4) GO TO 200
GO TO 100
C
C GET SYSTEM PARAMETER EDIT VARIABLE ADDRESSES
60 DO 70 K = 1,NS
70 ISYS(K) = ISTORE(IDX+ISYS(K))
IF (KOUNT.GE.4) GO TO 200
GO TO 100
C
C GET TIME STEP EDIT VARIABLE ADDRESSES
90 IF (ISTOR(IDXPRC+I).NE.35) GO TO 100
KOUNT = KOUNT + 1
DO 95 K = 1,NT
95 ITST(K) = ISTORE(IDX+ITST(K))
IF (KOUNT.GE.4) GO TO 200
C
100 IDX = IDX + ISTORE(IDX) + 1
C MAJOR EDIT
200 CONTINUE
C
C GET AVERAGE TIME STEP SIZE SINCE LAST MINOR EDIT
TNOW = TIMEX(IDX07)
NUMTS = NTTSP(IDX35) - NSTART
DTAVG(IDX35) = 0.0
IF (NUMTS.GT. 0) DTAVG(IDX35) = (TNOW - TSTART) / NUMTS
TSTART = TNOW
NSTART = NTTSP(IDX35)

```

```

C IF (.NOT. MAJC) GO TO 300
CALL SUBPG (DUMMY)
WRITE (6,600) (ISTOR(ITST(I)),I=1,2), RSTOR(ISYS(1))
C
C WRITE SYSTEM VALUES
WRITE (6,610) (RSTOR(ISYS(I)),I=2,NS)
C
C WRITE VOLUME VALUES
C
K = 0
WRITE (6,620)
DO 225 I = 1,NVOL
IF (LPRZ) GO TO 220
INEQ = IVOL(11) + K
IF (ISTOR(INEQ).LE.0) GO TO 220
C
C NON-EQUILIBRIUM PRESSURIZER VOLUME -- SPECIAL EDIT
C
CALL EDTPRZ (ISTOR(IVOL(1)+K),RSTOR(IVOL(2)+K),RSTOR(IVOL(9)+K),
* ISTORE(INEQ))
GO TO 225
220 CONTINUE
WRITE (6,625) ISTORE(IVOL(1)+K), (RSTOR(IVOL(L)+K),L=2,NV)
225 K = K + IVS
C
C WRITE JUNCTION VALUES
C
K = 0
WRITE (6,680)
DO 285 I = 1,NJUN
IT = ISTORE(JUN(4)+K)
WRITE(6,685) (ISTOR(JUN(L)+K),L=1,3), TYP(IT),
* (RSTOR(JUN(J)+K),J=5,NJ)
285 K = K + IJS
C
C EDIT EQUIVALENT LIQUID LEVEL
C
IF (LLIQL) CALL EDTLQL
C
C EDIT TWO FLUID VOLUME PARAMETERS
C
IF (LTFL) CALL EDTFLU
C
C EDIT SLIP QUANTITIES
C
IF (LSLIP) CALL EDTSLP (IDV,NVOL,IVS, IDJ,NJUN,IJS)
C
C EDIT CENTRIFUGAL PUMP QUANTITIES
C
IF (LPUMP) CALL EDTPMP
C
C EDIT CONDUCTOR PARAMETERS
C
IF (LCOND) CALL EDTCND (ISUBC,IVSL0L)
C
C EDIT CORE PARAMETERS
C
IF (LCORE) CALL EDTCOR (ISUBC,IVSL0L)
C

```

```

C   EDIT AUXILIARY DNB PARAMETERS
C
C   IF (LDNB) CALL EDTDNB
C
C   EDIT KINETICS PARAMETERS
C
C   IF (LKIN) CALL EDTKIN(RSTOR(ISYS(2)))
C
C   EDIT SPACE TIME KINETICS PARAMETRS
C
C   IF (LSTK) CALL EDTSTK
C
C   EDIT NON-CONDUCTING HEAT EXCHANGERS
C
C   IF (LHTX) CALL EDTHTX (IOLDVL, IVS)
C
C   WRITE DATA RECORD AND/OR TRAILER LABEL
C
300 IF (ISTOR(I2).EQ.0 .OR. .NOT.MINC) GO TO 400
    IF (ISTOR(ITST(2)).LE.0 .AND. NOGOY) GO TO 500
    NDATRC = ISTOR(IDXEDT+34)
C
C-----begin RETRAN/MINET code modification-----
ccc IF (PLTC.OR.LABL) CALL PLTAPE (IUNIT,LABL)
    IF (PLTC.OR.LABL) then
        CALL PLTAPE (IUNIT,LABL)
        call svcx3u
    endif
C-----end RETRAN/MINET code modification-----
C
    IF (ISTOR(I2).EQ.-2) GO TO 400
    IF (ISTOR(ITST(1)).LE.0) GO TO 315
310 IF (.NOT.MAJC) GO TO 400
315 LBLDX = ISTOR(IDXEDT+40) + IDXEDT
    IOFF = LBLDX
    IF (IBMRUN) IOFF = IOFF+ 4
    REEL = RSTOR(IOFF+2)
    IF (.NOT.IBMRUN) REEL = DSR(REEL, NBITS)
    NCHAR = 6
    CALL COMPAR (OLDVSN,RSTOR(IOFF+3*IREEL),NCHAR)
    IF(NCHAR .EQ. 6) GO TO 320
    NCHAR = 6
    CALL COMPAR (BLANK,OLDVSN,NCHAR)
    IF (NCHAR .EQ. 0) WRITE(6,730) IUNIT
    OLDVSN = RSTOR(IOFF + 3*IREEL)
320 WRITE (6, 740) NDATRC, (RSTOR(IOFF+3*IREEL+I-1),I=1,3)
    IF (IBMRUN) WRITE (6, 742) (RSTOR(LBLDX+I-1), I = 1,6)
    IF (.NOT.IBMRUN) WRITE (6, 744) RSTOR(LBLDX), RSTOR(LBLDX+1)
    IF (.NOT.LABL) GO TO 400
    WRITE (6,750) IUNIT
C
C   MINOR EDIT
C
C
C   STORE MINOR EDIT VARIABLES
400 IF (NEDI .EQ. 0) MINC = .FALSE.
    IF (.NOT. MINC) GO TO 500
    JXX = JXX + 1
C
C   SAVE BEGINING INDEX OF MINOR EDIT VARIABLES FOR THIS TIME STEP

```

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```

C
C   SETSIZ(1) = IDXMGO + 1
DO 410 I = 1,NEDV
    IDXMGO = IDXMGO + 1
    IDXVAR = ISTOR(IDXMAD+I)
410 RSTOR(IDXMGO) = FLOATR (RSTOR(IDXVAR))
C
C   SAVE MINOR EDIT DATA IF PRINTER PLOTS ARE REQUESTED
IF (LPRPLT) GO TO 415
    IDXB = IDXMGO - NEDV
    CALL PROC1(PRPLLOT,INDEX)
DO 412 I=1,NEDV
412 RSTOR(INDEX+I-1) = RSTOR(IDXB+I)
C
C   TEST IF MINORS TO BE PRINTED
415 IF (PEND .OR. (JXX.GE.50)) GO TO 420
    IF (.NOT.NOGOY) GO TO 500
C
C   PRINT MINOR HEADINGS
420 CONTINUE
    IF (LAUX) GO TO 455
    NUM = NEDV - 1
    NPGS = (NUM + 7)/8
    NUM = NEDV - 1
    MIN = 1
    MAX = 0
    DO 450 I = 1,NPGS
        CALL SUBPG (DUMMY)
        WRITE (6,695)
        INDEX = IDXMED
        MAX = MAX + MINO(NUM,8)
        WRITE (6,700) RSTOR(INDEX), (RSTOR(INDEX+J),J=MIN,MAX)
        INDEX = INDEX + NEDV
        INDEY = INDEX + NEDV
        WRITE (6,710) RSTOR(INDEX), RSTOR(INDEY),
        * (RSTOR(INDEX+J), RSTOR(INDEY+J), J=MIN,MAX)
        INDEX = INDEY + NEDV
        WRITE (6,700) RSTOR(INDEX), (RSTOR(INDEX+J),J=MIN,MAX)
C
C   SKIP ADDRESS SET
INDEX = INDEX + NEDV
DO 440 L = 1,JXX
    INDEX = INDEX + NEDV
    WRITE (6,720) RSTOR(INDEX), (RSTOR(INDEX+J),J=MIN,MAX)
440 CONTINUE
    NUM = NUM - 8
450 MIN = MAX + 1
455 CONTINUE
    JXX = 0
    IDXMGO = IDXMAD + NEDV
C
C
C   500 RETURN
C
600 FORMAT ('OSTANDARD TIME STEP NUMBER =',I6,10X,'ACTUAL TIME STEP NU
*MBER =',I6,10X,'TIME =',I1P,E13.6,' SECONDS'/)
610 FORMAT (' NORMALIZED CORE THERMAL HEAT REMOV.
* ENERGY WATER MASS AIR MASS'/
* CORE POWER POWER RATE
* BALANCE BALANCE BALANCE'/)

```

```

*      POWER      (MW)      (BTU/HR)      (BTU/HR)
* (BTU)      (LBM)      (LBM)'/1X,1P,7E14.6)
620 FORMAT ('O VOLUME',9X,'AVG. PRES.',3X,'TOT. MASS',4X,'AVG. ENTH.',
*3X,'AVG. DEN.',4X,'AVG. TEMP.',3X,'AVG. QUAL.',3X,'BUBB. MASS',3X,
*'MIX. LEV.',4X,'LIQ. MASS',/ NUMBER',9X,'(PSIA)',7X,'(LB)',9X,
*' (BTU/LB)',5X,'(LB/FT3)',5X,'(DEG. F)',18X,'(LB)',9X,'(FT)',9X,
*' (LB)')
625 FORMAT (1X,I5,9X,1P,9E13.5)
680 FORMAT ('O JUNCTION CONNECTS CHOKE JUN. FLOW JUN. ENTH.
*JUN. SPVL. P R E S S U R E D I F F E R E N T
*I A L S',/ NUMBER VOLUMES MODE (LB/SEC) (BTU/LB)
* (FT3/LB) STAG. PSI ELEV. PSI FRIC. PSI ACCL. PSI
* PUMP PSI')
685 FORMAT(1X,I5,I6,' TO',I4,1X,A8,1P,8E13.5)
695 FORMAT (//)
700 FORMAT (5X,A8,8(6X,A8))
710 FORMAT (3X,A8,A4,8(2X,A8,A4))
720 FORMAT (9(1X,1P,E13.5))
730 FORMAT ('OA NEW DATA TAPE VOLUME HAS BEEN MOUNTED ON UNIT',I3/
* ' *****')
740 FORMAT ('/O DATA RECORD NUMBER',I6,' WAS WRITTEN ON TAPE VSN = ',
* A6,' DENSITY = ',A2,' , CREATED ON ',A5,'/ AND WAS LABELED ')
742 FORMAT('+',17X,6A8)
744 FORMAT('+',17X,2A10)
750 FORMAT ('O TRAILER LABEL WRITTEN ON UNIT',I3)
END

```

```

SUBROUTINE RETRAN
C
C SUBROUTINE RETRAN IS THE DRIVER FOR MODULE RETRAN.
C
C RETRAN IS CALLED BY SUBROUTINE RMAIN.
C
C
C
C
C *CA BKCM
  DATA IUNIT, JUNIT / 13, 14 /
C>-----begin BNL code modification-----
ccc CALL REMARK(' EXECUTE MODULE RETRAN')
  CALL REMARK(' EXECUTE MODULE RETRAN ')
C<-----end BNL code modification-----
  LEN = 0
  IF(ISTOR(FILIDX(2)).EQ.-1)LEN=1025
C
C>-----begin BNL code modification-----
ccc CALL REMARK(' CALL SEGMENT INRTRN')
  CALL REMARK(' CALL SEGMENT INRTRN ')
C<-----end BNL code modification-----
  CALL INRTRN
C
C INITIALIZE SPACE TIME KINETICS
  IF ( ISTOR(FILIDX(02) + 18 ) .LT. 4 ) GO TO 50
C>-----begin BNL code modification-----
ccc CALL REMARK(' CALL SEGMENT STATIC')
  CALL REMARK(' CALL SEGMENT STATIC ')
C<-----end BNL code modification-----
  CALL STATIC
C
C>-----begin BNL code modification-----
ccc50 CALL REMARK(' CALL SEGMENT STSTAT')
  50 CALL REMARK(' CALL SEGMENT STSTAT ')
C<-----end BNL code modification-----
  CALL STSTAT
  GO TO 100
C
C ENTRY RESTRT
C>-----begin BNL code modification-----
ccc CALL REMARK(' EXECUTE MODULE RESTRT')
  CALL REMARK(' EXECUTE MODULE RESTRT ')
C<-----end BNL code modification-----
  LEN = 1025
C
C>-----begin BNL code modification-----
ccc CALL REMARK(' CALL SEGMENT INRSTR')
  CALL REMARK(' CALL SEGMENT INRSTR ')
C<-----end BNL code modification-----
  CALL INRSTR (IUNIT,JUNIT)
C
C INITIALIZE SPACE TIME KINETICS AT RESTART TIME
  IF ( ISTOR(FILIDX(02) + 18 ) .LT. 4 ) GO TO 75
C>-----begin BNL code modification-----
ccc CALL REMARK(' CALL SEGMENT STSTAT')
  CALL REMARK(' CALL SEGMENT STSTAT ')
C<-----end BNL code modification-----
  CALL STATIC
C
C>-----begin BNL code modification-----

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RT

```

ccc75 CALL REMARK(' CALL SEGMENT CPYPLT')
  75 CALL REMARK(' CALL SEGMENT CPYPLT ')
C<-----end BNL code modification-----
  CALL CPYPLT(IUNIT,JUNIT)
C
C CALL OVRLYP (IUNIT)
C
C
C>-----begin RETRAN/MINET code modification-----
CC100 IF(.NOT. LSTOR(FILIDX(7))) CALL REDUCE(LEN,0,1 )
  100 continue
C<-----end RETRAN/MINET code modification-----
C
C
C>-----begin BNL code modification-----
ccc CALL REMARK(' CALL SEGMENT TRAN')
  CALL REMARK(' CALL SEGMENT TRAN ')
C<-----end BNL code modification-----
  CALL TRAN (JUNIT)
C
C>-----begin BNL code modification-----
ccc CALL REMARK(' CALL SEGMENT PRNPLT')
  CALL REMARK(' CALL SEGMENT PRNPLT ')
C<-----end BNL code modification-----
  CALL TRPSUM
  IF (ISTOR(FILIDX(2) + 1).GE.0) GO TO 150
  CALL PRNPLT
C
  150 CONTINUE
  RETURN
  END

```

```

SUBROUTINE STSTAT
C
C SUBROUTINE STSTAT CONTROLS THE PROGRAM FLOW FOR STEADY
C STATE INITIALIZATION.
C
C STSTAT IS CALLED BY SUBROUTINE RETRAN.
C
C
*CA BKCM
*CA ID02
*CA ID05
*CA ID06
*CA ID07
*CA ID08
*CA ID11
*CA ID20
*CA ID35
*CA ID38
C
LOGICAL SSTCVG
REAL NEXTID
*CA SCND
*CA SJUN
*CA SVOL
REAL MESSAGE (3,20), MESAG1(3,18), MESAG2(3,2)
EQUIVALENCE (MESSAGE(1,1),MESAG1(1,1)), (MESSAGE(1,19),MESAG2(1,1))
DIMENSION STDATA(30)
LOGICAL DUML,LUVSKP
LOGICAL DEBUGSS
C
C>-----begin RETRAN/MINET code modification-----
*CA ID40
integer dbg
common / local / i5,ms5,is5
*CA /MRCLST/
*CA /MRVdat/
data dbg/22/
C<-----end RETRAN/MINET code modification-----
C
*CA UNIT
DATA LUVSKP / .TRUE. /
DATA ZERO / 0.0 /, ONE / 1.0 /
DATA ITER,ISSVE / 0, 0 /
DATA VSEPS / 1.0E-4 /
DATA DEBUGSS / .FALSE. /
DATA ITRDBG / 10000 /
DATA WRNING / 8HWARNING /, ERROR / 8H* ERROR /
DATA MESAG1 /
* 8H INPUT E, 8HRROR. , 8H ,
* 8H FAILURE, 8H IN INIT, 8HLZ. ,
* 8H FAILURE, 8H IN ENER, 8HGY. ,
* 8H FAILURE, 8H IN JUNP, 8HRP. ,
* 8H FAILURE, 8H IN DER1, 8HVS. ,
* 8H FAILURE, 8H IN PRES, 8HUR. ,
* 8H FAILURE, 8H IN PRSO, 8HRK. ,
* 8H FAILURE, 8H IN HAVG, 8H. ,
* 8H FAILURE, 8H IN JVED, 8HIT. ,

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```

* 8H FAILURE, 8H IN KINI, 8HTL. ,
* 8H FAILURE, 8H IN STAT, 8HPL. ,
* 8H FAILURE, 8H IN CONT, 8HRL. ,
* 8H FAILURE, 8H IN JHOF, 8HF. ,
* 8H FAILURE, 8H IN POST, 8HW. ,
* 8H FAILURE, 8H IN DNB, 8H. ,
* 8H FAILURE, 8H IN BUBI, 8HINT. ,
* 8H FAILURE, 8H IN QX11, 8H. ,
* 8H FAILURE, 8H IN ADVF, 8HLO. /
DATA MESAG2 /
* 8H FAILURE, 8H IN MDOT, 8H. ,
* 8H FAILURE, 8H IN SLIP, 8H. /
CALL TIMSEG(2)
C *****
C
C TURN ON STEADY-STATE DEBUG FLAG IF JSSDBG IS LESS THAN ZERO
C
C IF (JSSDBG(FILIDX(7)).LT.0) ITRDBG = -JSSDBG(FILIDX(7))
C
C>-----begin BNL code modification-----
ccc CALL REMARK(' ENTERED SEGMENT STSTAT')
CALL REMARK(' ENTERED SEGMENT STSTAT ')
C<-----end BNL code modification-----
I2 = FILIDX(02)
I5 = FILIDX(05)
C
C>-----begin RETRAN/MINET code modification-----
lsq = filidx(07)
C<-----end RETRAN/MINET code modification-----
C
C
C DEBUGSS = .TRUE.
IS5 = SETSIZ(05)
MS5 = I5 + (NVOL(I2)-1)*IS5
I6 = FILIDX(06)
IS6 = SETSIZ(06)
MS6 = I6 + (NJUN(I2) - 1) * IS6
I7 = FILIDX(07)
I35 = FILIDX(35)
IMPCVG(I35) = .TRUE.
ITLEFT = IABS(LCOUNT(I7))
I8 = FILIDX(8)
IS8 = SETSIZ(8)
I20 = FILIDX(20)
IS20 = SETSIZ(20)
MS20 = I20 + (NSLB(I2)-1)*IS20
ITRP = NTRP(I2)*IS8-1+I8
IHLIM = IABS(LCOUNT(I7))/3
IHLIM = MAXO(3,IHLIM)
JSSDBG(I7) = ITLEFT
C
C TEST FOR INPUT ERROR
I = 0
IF (NOGO(I7)) GO TO 100
C
C IEQS = NEWEQS(I2)
IF (JSST(I2).EQ.1) GO TO 40
C
C SEND SLIP THROUGH HEM LOOP INITIALLY
C
C IF (ISFLAG(I2) .GT. 0) ISSVE = ISFLAG(I2)

```

```

ISFLAG(I2) = 0
C
C ***** TEMPORARY PATCH FOR TWO-FLUID MODEL
C
NEWEQS(I2) = 0
C
C SET IMPLICIT NUMERICS OPTION OFF FOR STEADY-STATE
C
IMPSAV = INEXPL(I2)
INEXPL(I2) = -1
AJUNC = NEXTID(0)
ISZJ = 2
LENJ = ISZJ*NJUN(I2)
CALL RESERV (AJUNC, LENJ, 2, IDXJ)
CALL ZEROUT (RSTOR(IDXJ), LENJ)
AVOL = AJUNC + 1.0
ISZV = 7
LENV = ISZV*NVOL(I2)
CALL RESERV (AVOL, LENV, 2, IDXV)
CALL ZEROUT (RSTOR(IDXV), LENV)
IF (NSLB(I2).LE.0) GO TO 20
ASLB = AVOL + 1.0
LENS = 2
CALL RESERV (ASLB, LENS*NSLB(I2), 2, IDXS)
C
C SAVE INPUT HEAT TRANSFER AREAS FOR HEAT EXCHANGER HEAT CONDUCTORS
C
II = IDXS
DO 10 I = I20, MS20, IS20
  AHTO(II, 1) = AHTL(I)*SLEN(I)
  AHTO(II, 2) = AHTR(I)*SLEN(I)
10 II = II + 2
C
C SAVE INPUT BUBBLE CONSTANTS
C
20 IF (NBUB(I2).LE.0) GO TO 40
NB = NBUB(I2) + 1
ABUB = NEXTID(0)
ISZB = NB*SETSIZ(11)
CALL RESERV (ABUB, ISZB, 1, IDXB)
JB = FILIDX(11)
CALL MOVE (ALPH(JB), RSTOR(IDXB), ISZB)
C
C OBTAIN INTIAL ESTIMATES OF VOLUME PROPERTIES
C>-----begin BNL code modification-----
ccc40 CALL REMARK(' CALL SEGMENT INITLZ')
40 CALL REMARK(' CALL SEGMENT INITLZ ')
C<-----end BNL code modification-----
I = 1
CALL INITLZ (IDXJ, ISZJ, IDXV, ISZV, MEQS)
IF (NOGO(I7)) GO TO 100
C
C>-----begin RETRAN/MINET code modification-----
kount = 0
iget=1
iset=2
time=timex(1sq)
if (time.eq.0.0 ) then
  timolm = 0.0
  deltm = 0.0
endif

```

```

if (time.ne.timnem) then
  deltm = time-timnem
  timolm = timnem
endif
timnem = time
C
call gtim9u(c1nk,+1,lnk1)
if(lnk1.lt.0) write(dbg,1788)
C
if(jsst(i2).eq.0) go to 6000
idx02=filidx(02)
idx06=filidx(06)
idx40=filidx(40)
isiz06=setsiz(06)
njun1 =njun(idx02)
inpsi =ixnpsi(idx40)
mjunf1=mjunf(idx40)
C
COM =====
COM GET PARAMETERS FROM RETRAN STEADY CALCULATION
COM TO PASS TO MINET STEADY CALCULATION
COM =====
C
if (iprt.ne.0) write(dbg,1702)
C
COM -----
COM LOOP OVER FILL JUNCTIONS (IF ANY)
COM -----
C
if (mjunf1.le.njun1) then
  do 1880 jun=mjunf1,njun1
    ipsi = npsi(inpsi+jun-1)
    i = idx06 + (ipsi-1)*isiz06
    call fillm(i,iget)
  1880 continue
endif
if (iprt.ne.0) then
  write(dbg,1703)
  write(dbg,705) iter
endif
C
if(ntdv(idx02).gt.0) call tdv(iget)
C
COM =====
COM FIRST REAL CALL TO STLINK
COM MINET STEADY LINK CALLED
COM MINET STEADY CALCULATION
COM PARAMETERS PASSED THROUGH COMMON MINRAN
COM =====
C
if (iprt.ne.0) write(dbg,1603)
C
call stlink(0)
C
COM =====
COM SET PARAMETERS FOR RETRAN STEADY CALCULATION
COM THEY CAME FROM MINET STEADY CALCULATION
COM =====

```

```

C      if (iprt.ne.0) write(dbg,2702)
C
COM -----
COM LOOP OVER FILL JUNCTIONS (IF ANY)
COM -----
C
C      if (mjunf1.le.njun1) then
C          do 2880 jun=mjunf1,njun1
C              ipsi = npsi(inpsi+jun-1)
C              i = idx06 + (ipsi-1)*isiz06
C
C          call fillm(i,iset)
C
C      2880 continue
C      endif
C      if (iprt.ne.0) then
C          write(dbg,2703)
C          write(dbg,705) iter
C      endif
C
C      if(ntdv(idx02).gt.0) call tdv(iset)
C
C      6000 continue
C
C      1601 format(/, '=====')
C          X //, 'STLINK CALL FROM STSTAT TO INITIALIZE COMMON ',
C          X //, '=====')
C      1603 format(/, '=====')
C          X //, 'STLINK CALL FROM STSTAT TO GET LINK PARAMETERS ',
C          X //, '=====')
C      1702 format(/, '=====')
C          X //, 'FILLM CALLS FROM STSTAT WITH OR WITHOUT JSST=1 GET=1')
C      1703 format(/, '=====')
C          X //, 'TDV CALLS FROM STSTAT WITH OR WITHOUT JSST=1 GET=1',
C          X //, '=====')
C      1788 format(/, '=====')
C          X //, 'NEGATIVE LNK(1) - NO MINET EXECUTION ',
C          X //, '=====')
C      2702 format(/, '=====')
C          X //, 'FILLM CALLS FROM STSTAT WITH OR WITHOUT JSST=1 SET=2')
C      2703 format(/, '=====')
C          X //, 'TDV CALLS FROM STSTAT WITH OR WITHOUT JSST=1 SET=2',
C          X //, '=====')
C
C<-----end RETRAN/MINET code modification-----
C
C      IF (JSST(I2).EQ.1) GO TO 60
C
C      START STEADY STATE ITERATIONS
C
C      IFRST = 1
C      ITERST = 1
C      SSTCVG = .FALSE.
C
C      GET NEW PRESSURES AND LOSS COEFFICIENTS
C      50 I = 6
C          ITER1 = ITER + 1
C          IF (ITER1.GE. ITRDBG) DBUGSS = .TRUE.
C          IF (DBUGSS) WRITE (6,1000) ITER1
C      1000 FORMAT (1H1,/, ' TOP OF STEADY-STATE LOOP FOR ITERATE', I4)
C          CALL PRSORK (IDXV, ISZV, IDXJ, ISZJ, ITERST, IFRST)
C

```

```

C      RESTORE SLIP
C
C      IF(ITER.GT. 1) ISFLAG(I2) = ISSVE
C      IF(NOGO(I7)) GO TO 100
C
C      INITIALIZE BUBBLE RISE MODEL
C      IF(NBUB(I2).LE.0 .AND. NSEPR(I2).LE.0) GO TO 55
C      I = 15
C      CALL BUBINT (IDXV, ISZV, ITERST)
C      IF (NOGO(I7)) GO TO 100
C
C      DO STEADY STATE ENERGY BALANCE
C      55 I = 7
C          CALL HAVG (IDXV, ISZV, MEQS)
C          IF (NOGO(I7)) GO TO 100
C
C      UPDATE STATE PROPERTIES -- P-H PLANE
C      I = 10
C      CALL STATPH (ITLEFT)
C      IF (NOGO(I7)) GO TO 100
C      IF (LUVSKP) GO TO 65
C
C      GET U-V STATE PROPERTIES
C      60 I = 5
C          IF(JSST(I2).EQ.1) GO TO 65
C          CALL PRESUR(ZERO)
C          IF (NOGO(I7)) GO TO 100
C
C      65 CONTINUE
C
C      GET NEW ENERGY TRANSFER RATES
C      70 IF(NSLB(I2).LE.0 .AND. NHTX(I2).LE.0
C          * .AND. NTSH(I2).LE.0) GO TO 80
C      I = 2
C      CALL ENERGY (ZERO, I)
C      IF (NOGO(I7)) GO TO 100
C
C      GET JUNCTION PROPERTIES
C
C      80 CONTINUE
C      I = 3
C      CALL JUNPRP (ZERO)
C      IF (NOGO(I7)) GO TO 100
C
C      GET NEW ITERATE VALUE OF VSLIP AND SLPCNV
C
C      IF (ISFLAG(I2) .LE. 0) GO TO 81
C      I = 19
C      CALL SLIP (ZERO)
C      IF (NOGO(I7)) GO TO 100
C      81 CONTINUE
C
C      CHECK FOR FILL ENTHALPY BIAS
C
C      IF (JSST(I2).EQ.1) GO TO 82
C      IF (SSTCVG) GO TO 82
C      IF (NFLL(I2).LE.0) GO TO 82
C      I = 12
C      CALL JHOFF
C      IF (NOGO(I7)) GO TO 100

```

```

C
C COMPUTE VOLUME DERIVATIVES
82 CONTINUE
I = 4
CALL DERIVS
IF(NOGO(I7)) GO TO 100
C
C OBTAIN VAPOR MASS GENERATION RATES AND LIQUID ENERGY EQUATION
C SOURCE TERMS WHEN APPLICABLE
C
I = 18
IF (NEWEQS(I2).GE.1) CALL MDOT (ZERO)
IF (NOGO(I7)) GO TO 100
C
C EVALUATE MOMENTUM EQUATION COEFFICIENTS
C
I = 17
CALL ADVFLO (ZERO)
IF (NOGO(I7)) GO TO 100
C
C STROBE ALL TRIPS TO MAKE COINCIDENCE AND INDIRECT TRIPS WORK
C CALL TRIP
C
C CHECK FOR STEADY STATE CONVERGENCE
C IVAR = 1
C
IF (JSST(I2).EQ.1) GO TO 200
ITER = ITER + 1
ITLEFT = IABS(LCOUNT(I7)) - ITER - 1
JSSDBG(I7) = ITLEFT
C
C TEST MOMENTUM EQUATION CONVERGENCE
IF (DEBUGSS) WRITE (6,942) VSEPSI(I7), ACEPSI(I7), HEPSI(I7)
942 FORMAT (//,5X,'CONVERGENCE VALUES ; VSLIP = ',1P,E11.4,
* ' ACCEL PSI = ',1P,E11.4,' HERROR = ',1P,E11.4,//
* 1X,5H JUN,3X,9HACCEL PSI,4X,6HDVSLIP,7X,2HHP,11X,6HVSLIPJ,7X,
* 5HVGASJ,8X,6HSLPCNV,7X,5HVOIDJ,8X,5HVG/VL,8X,4HIFRJ,3X,
* 10HCNVRG JUN/)
DO 92 I=16,MS6,IS6
IF (.NOT.DEBUGSS) GO TO 88
VELLIQ = VSLPJ(I) + VGASJ(I)
DVSLIP = ZERO
SLIPR1 = ZERO
IF (VELLIQ.NE.ZERO) SLIPR1 = VGASJ(I) / VELLIQ
88 CONTINUE
IF (ISFLAG(I2).LE.0) GO TO 89
DVSLIP = VSLPJ(I) - VSLPJO(I)
IF (VSLPJ(I).NE.ZERO) DVSLIP = DVSLIP/VSLPJ(I)
IF (ABS(DVSLIP).LE.VSEPSI(I7)) GO TO 89
IVAR = IVAR + 1
IF (ITER.LT.IABS(LCOUNT(I7))) GO TO 89
IF (.NOT.DEBUGSS) WRITE (6,604) OLJUNN(I), DVSLIP
604 FORMAT ('O***** ERROR, JUNCTION',I4,' SLIP VELOCITY FAILED TO'
* ', CONVERGE TO A STEADY STATE SOLUTION, DVSLIP =',E15.6)
89 CONTINUE
IF (ABS(DELA(I)).LE. ACEPSI(I7)) GO TO 90
IVAR = IVAR + 1
IF (ITER .LT. IABS(LCOUNT(I7))) GO TO 90
IF (.NOT. DEBUGSS) WRITE (6,605) OLJUNN(I), DELA(I)

```

```

605 FORMAT ('O***** ERROR, JUNCTION',I4,' ACCELERATION PRESSURE FAI
*LED TO CONVERGE TO A STEADY STATE SOLUTION, DELA =',E15.6)
90 CONTINUE
IF (.NOT. DEBUGSS) GO TO 92
IF ((ABS(DVSLIP) .LE. VSEPSI(I7)) .AND.
* (ABS(DELA(I)) .LE. ACEPSI(I7))) GO TO 91
WRITE (6,1943) OLJUNN(I), DELA(I), DVSLIP, HP(I), VSLPJ(I),
* VGASJ(I), SLPCNV(I), VOID(I), SLIPR1, IFRJ(I), OLJUNN(I)
1943 FORMAT (3X,I3,2X,8(1PE11.4,2X),I4,8H **** ,I3)
GO TO 92
91 WRITE (6,943) OLJUNN(I), DELA(I), DVSLIP, HP(I), VSLPJ(I),
* VGASJ(I), SLPCNV(I), VOID(I), SLIPR1, IFRJ(I)
943 FORMAT (3X,I3,2X,8(1PE11.4,2X),I4)
92 CONTINUE
C
C TEST ENERGY EQUATION CONVERGENCE
C II = IDXV
IF (DEBUGSS) WRITE (6,944)
944 FORMAT (1H0,1X,5H VOL ,3X,7HH ERROR,6X,2HFU,11X,2HHW,11X,
* 4HQSP,9X,6HVSLIPI,7X,5HVGASI,8X,5HVOIDI,8X,5HPRES ,8X,
* 3HIFR,3X,10HCNVRG VOL/)
DO 97 I=15,MS5,IS5
HERROR = ZERO
IF (WVBAR(I) .NE. ZERO) HERROR = FU(I) /WVBAR(I)
IF (.NOT.DEBUGSS) GO TO 94
VELLIQ = VSLPV(I) + VGASV(I)
SLIPR1 = ZERO
IF (VELLIQ.NE.ZERO) SLIPR1 = VGASV(I) / VELLIQ
94 CONTINUE
IF (ISINK(II) .NE. 0) GO TO 95
IF (ABS(HERROR) .LE. HEPSI(I7)) GO TO 95
IF (DEBUGSS) WRITE (6,1945) OLVOLN(I), HERROR, FU(I), HW(I),
* QSPL(I), VSLPV(I), VGASV(I), VOIDV(I), P(I), IFR(I), OLVOLN(I)
IVAR = IVAR + 1
IF (DEBUGSS) GO TO 97
IF (ITER .LT. IABS(LCOUNT(I7))) GO TO 95
IF (.NOT. DEBUGSS) WRITE (6,610) OLVOLN(I), HERROR
610 FORMAT ('O***** ERROR, VOLUME',I4,' ENTHALPY FAILED TO CONVERGE
* TO A STEADY STATE SOLUTION, ENTHALPY ERROR =',E15.6)
95 CONTINUE
IF (DEBUGSS .AND. (ABS(HERROR) .LT. HEPSI(I7)))
* WRITE (6,945) OLVOLN(I), HERROR, FU(I), HW(I),
* QSPL(I), VSLPV(I), VGASV(I), VOIDV(I), P(I), IFR(I)
97 II = II + ISZV
945 FORMAT (1H ,2X,I3,2X,8(1PE11.4,2X),I4)
1945 FORMAT (1H ,2X,I3,2X,8(1PE11.4,2X),I4,3X,8H **** ,I3)
SSTCVG = IVAR.LE.1
IF (SSTCVG .AND. (.NOT.LUVSKP)) GO TO 190
IF (ITER .GE. IABS(LCOUNT(I7))) GO TO 198
C
C RECALCULATE PRESSURE DISTRIBUTION AND FORM LOSS COEFFICIENTS
C ITERST = IABS(LCOUNT(I7)) -ITER -1
IFRST = 0
IF (ITERST.LE.IHLIM) LUVSKP = .FALSE.
IF (ITERST.GT.0 .AND. ITER.LE.3) GO TO 50
IF (LUVSKP .AND. SSTCVG) LUVSKP = .FALSE.
GO TO 50
190 WRITE (6,615) ITER
615 FORMAT (//'OSTEADY-STATE CONVERGED IN',I4,' ITERATIONS.')
C

```

C>-----begin RETRAN/MINET code modification-----

```
C
  kount = kount + 1
C
  idx02=filidx(02)
  idx06=filidx(06)
  idx40=filidx(40)
  isiz06=setsiz(06)
  njun1 =njun(idx02)
  inpsi =inxpsi(idx40)
  mjunf1=mjunf(idx40)
  if (iprt.ne.0) then
    write(dbg,702)
    write(dbg,705) iter
  endif
```

```
C
COM -----
COM LOOP OVER FILL JUNCTIONS (IF ANY)
COM -----
```

```
C
  if (mjunf1.le.njun1) then
    do 880 jun=mjunf1,njun1
      ipsi = npsi(inpsi+jun-1)
      i     = idx06 + (ipsi-1)*isiz06
```

```
C
      call fillm(i,iget)
```

```
C
880  continue
    endif
    if (iprt.ne.0) then
      write(dbg,703)
      write(dbg,705) iter
    endif
```

```
C
  if (ntdv(idx02).gt.0) call tdv(iget)
```

```
C
COM =====
COM STEADY STATE ITERATION CALLS
COM MINET STEADY LINK CALLED
COM MINET STEADY CALCULATION
COM PARAMETERS PASSED THROUGH COMMON MINRAN
COM =====
```

```
C
  if (iprt.ne.0) write(dbg,1606)
```

```
C
  call stlink(0)
```

```
C
COM =====
COM SET PARAMETERS FOR RETRAN STEADY CALCULATION
COM THEY CAME FROM MINET STEADY CALCULATION
COM =====
```

```
C
  if (iprt.ne.0) write(dbg,3702)
```

```
C
COM -----
COM LOOP OVER FILL JUNCTIONS (IF ANY)
COM -----
```

```
C
  if (mjunf1.le.njun1) then
    do 3880 jun=mjunf1,njun1
```

```
      ipsi = npsi(inpsi+jun-1)
      i     = idx06 + (ipsi-1)*isiz06
```

```
C
      call fillm(i,iset)
```

```
C
3880  continue
    endif
    if (iprt.ne.0) then
      write(dbg,3703)
      write(dbg,705) iter
    endif
```

```
C
  if (ntdv(idx02).gt.0) call tdv(iset)
```

```
C
  if (jsst(i2).eq.0.and.kount.lt.1) go to 50
```

```
C
702  format( ' FILLM CALLS FROM STSTAT GET=1',
```

```
      X /, ' =====')
```

```
703  format( ' TDV CALLS FROM STSTAT GET=1',
```

```
      X /, ' =====')
```

```
705  format( ' ITER =',I4)
```

```
1606 format( /, ' =====')
```

```
      X /, ' STLINK CALL FROM STSTAT STEADY STATE ITERATION ',
```

```
      X /, ' =====')
```

```
3702 format( ' FILLM CALLS FROM STSTAT SET=2',
```

```
      X /, ' =====')
```

```
3703 format( ' TDV CALLS FROM STSTAT SET=2',
```

```
      X /, ' =====')
```

```
C<-----end RETRAN/MINET code modification-----
```

```
C
  IF (LCOUNT(I7) .GT. 0) WRNNG = ERROR
```

```
  II = IDXV - ISZV
```

```
  DO 192 J = 15,MS5,IS5
```

```
  II = II + ISZV
```

```
  IF (IBUB(J).EQ.0) GO TO 192
```

```
  IF (HSET(II) .EQ. 0.0) GO TO 191
```

```
  HLO = HSET(II) - HEPSI(I7)
```

```
  HHI = HSET(II) + HEPSI(I7)
```

```
  IF (HW(J).GE.HLO .AND. HW(J).LE.HHI) GO TO 191
```

```
  WRITE (6,620) WRNNG, HW(J), HSET(II), OLVOLN(J)
```

```
  IF (LCOUNT(I7) .LT. 0) GO TO 191
```

```
  NOGO(I7) = .TRUE.
```

```
  I = 10
```

```
191 CONTINUE
```

```
  IF (PSET(II) .EQ. 0.0) GO TO 192
```

```
  PLO = PSET(II) - ACEPSI(I7)
```

```
  PHI = PSET(II) + ACEPSI(I7)
```

```
  IF (P(J).GE.PLO .AND. P(J).LE.PHI) GO TO 192
```

```
  WRITE (6,625) WRNNG, P (J), PSET(II), OLVOLN(J)
```

```
  IF (LCOUNT(I7) .LT. 0) GO TO 192
```

```
  NOGO(I7) = .TRUE.
```

```
  I = 10
```

```
192 CONTINUE
```

```
  IF (NOGO(I7)) GO TO 100
```

```
620  FORMAT (/ ' *****',A8, ' - CALCULATED STEADY-STATE ENTHALPY, ',
```

```
      *1P,E13.6, ' DOES NOT EQUAL INPUT ENTHALPY, ',1P,E13.6, ' FOR VOLUME',
```

```
      * 15, ' *****' /
```

```
      * 18X, ' INPUT ENTHALPY AND MIXTURE LEVEL ARE INCONSISTENT')
```

```
625  FORMAT (/ ' *****',A8, ' - CALCULATED STEADY-STATE PRESSURE, ',
```

```
      *1P,E13.6, ' DOES NOT EQUAL INPUT PRESSURE, ',1P,E13.6, ' FOR VOLUME',
```

```

*      I5, ' *****'/
*      18X, 'INPUT ENTHALPY AND MIXTURE LEVEL ARE INCONSISTENT')
C
C   CALCULATE EFFECTS AND INITIAL CONDITIONS OF CONTROL SYSTEM
200 CONTINUE
    IF (ICF(I2).EQ.0) GO TO 210
    NITER = ITRCNT(I2)
    I = 11
    DO 105 NCALL = 1, NITER
    CALL CONTRL (0,0,ZERO,ZERO,1,ZERO)
105 CONTINUE
    IF (NOGO(I7)) GO TO 195
C
C   EDIT VOLUME AND JUNCTION DATA BEING USED
210 CONTINUE
    I = 8
C>-----begin BNL code modification-----
ccc100 CALL REMARK(' CALL SEGMENT JVEDIT')
100 CALL REMARK(' CALL SEGMENT JVEDIT  ')
C<-----end BNL code modification-----
    CALL JVEDIT (IDX, LENS, IDXB)
    IF(NOGO(I7)) GO TO 195
C
C   INITIALIZE POINT KINETICS
120 I = 9
    IF(NODEL(I2).LE.0 .OR. NODEL(I2).GE.4) GO TO 115
    CALL KINITL
    IF (NOGO(I7)) GO TO 195
C
C   WRITE TRIP STATUS FOR TRIP SUMMARY
115 CALL TEDIT
    INITIALIZE SPACE TIME KINETICS
C
    IF ( NODEL(I2) .LT. 4 ) GO TO 110
    I = 16
    CALL QX1I
    IF (NOGO(I7)) GO TO 195
C
C   INITIALIZE AUXILIARY DNB CALCULATION
110 IF (IDNBC(I2).LE.0) GO TO 250
    I = 14
    CALL DNBM
    IF (.NOT. NOGO(I7)) GO TO 250
C
C   WRITE ERROR MESSAGES
195 I = I + 1
    CALL SUBPG (DUMY)
C   NODEL IS SET TO -4 IF AN ERROR IS DETECTED IN SPACE TIME KINETICS
C   KINETICS INITIALIZATION.
    IF (NODEL(I2) .EQ. -4) I=17
    IF (I .GT. 1) WRITE(6,600) (MESSAGE(J,I),J=1,3)
    GO TO 250
198 CONTINUE
    LCNT=IABS(LCOUNT(I7))
    WRITE(6,601)LCNT
601 FORMAT('0**** UNABLE TO REACH STEADY STATE WITH THE GIVEN CONVERG
*ENCE CRITERIA IN ', I3, ' ITERATIONS')
    IF (LCOUNT(I7).LT.0) GO TO 200

```

```

CALL FAIL
C>-----begin BNL code modification-----
ccc CALL REMARK(' CALL SEGMENT JVEDIT')
    CALL REMARK(' CALL SEGMENT JVEDIT  ')
C<-----end BNL code modification-----
    CALL JVEDIT (IDX, LENS, IDXB)
C
C   DELETE SCRATCH FILES
C
250 IF (JSST(I2) .EQ. 1) GO TO 255
    IF (NSLB(I2) .GT. 0) CALL DELETE (ASLB)
    CALL DELETE (AJUNC)
    CALL DELETE (AVOL)
    JSST(I2) = 1
    CALL DELETE (FILID(56))
    INEXPL(I2) = IMPSAV
C
C   SAVE TIME ZERO PARAMETERS FOR IMPLICIT NUMERICS
C
255 IF (INEXPL(I2).NE.-1) CALL SAVIMP
C
C   ZERO ARRAYS USED TEMPORARILY IN STEADY STATE
C
DO 999 I=I5,MS5,IS5
XUO (I) = ZERO
XMFO (I) = ZERO
XMAO (I) = ZERO
IF (NEWEQS(I2).LT.1) GO TO 999
XMVO (I) = ZERO
IF (NEWEQS(I2).LT.2) GO TO 999
XULO (I) = ZERO
999 CONTINUE
2000 CONTINUE
C
C   ***** TEMPORARY PATCH FOR TWO-FLUID MODEL
C
NEWEQS(I2) = IEQS
IF (IEQS.GT.0) CALL PRESUR(ZERO)
IF (IEQS.GT.0) CALL ENERGY (ZERO,1)
IF (IEQS.GT.0) CALL JUNPRP (ZERO)
IF (IEQS.GT.0) CALL MDOT (ZERO)
RETURN
C
600 FORMAT (15(1H0/),30X, 'STEADY STATE ERROR **** ',3A8)
602 FORMAT(15(1H0/),40X, '**** INPUT ERROR ****')
END

```

```

SUBROUTINE TIMINT (NUMBER)
C
C SUBROUTINE TIMINT IS AN INTERNAL TIMING ROUTINE USED TO TIME
C VARIOUS FACIONS OF RETRAN COMPUTATIONS.
C
C TIMINT IS CALLED BY SUBROUTINES PLOTER, REEDIT, INRTRN, INDATA.
C
C NUMBER = TABLE NUMBER OF ROUTINE TO BE TIMED (INPUT)
C
*CA BKCM T
EQUIVALENCE (ITIME,CPU)
*CA ID02 T
*CA ID07 T
REAL NEXTID
REAL IA(21)
DIMENSION INOUT(21)
C>-----begin RETRAN/MINET code modification-----
integer pageno
C<-----end RETRAN/MINET code modification-----
C
C FLAG TO AVOID FILIDX(7) PRIOR TO ITS BEING SET UP
LOGICAL ISUBF
DATA ISUBF / .FALSE. /
DATA IA /
* 8H* INPUT ,8H* STSTAT,8H* TRAN ,8H* TSTP ,8H* ADVFLO,
* 8H DIRSOL,8H GENMAT,8H SLIP ,8H* CONTRL,8H* PRESUR,
* 8H STATEW,8H STATUM,8H PRZR ,8H* POWRT ,8H* ENERGY,
* 8H SLABHT,8H TURBOT,8H* JUNPRP,8H PUMPS ,8H* EDIT ,
* 8H PLTAPE /
C INOUT - FLAGS FOR FORMAT STATEMENT - 1 IF OUTER, 0 IF INNER
DATA INOUT / 1, 1, 1, 1, 1, 0, 0, 0, 1, 1, 0, 0, 0, 1, 1, 0, 0, 1,
1 0, 1, 0 /
DATA NAME / 21 /
DATA CPUSAV / 1.E20 /, IPAGE / 0 /
IF(NUMBER.GT.0) GO TO 5
WRITE(6,100)
100 FORMAT('O***** ERROR, ARGUMENT IN CALL TO TIMINT MUST BE GREAT
*ER THAN ZERO')
CALL FABEND
5 LEN = 2*NAME
TIMFIL = NEXTID(0)
IF (TIMFIL.LT.4.0) TIMFIL = 4.0
CALL RESERV (TIMFIL,LEN,1,INDEX)
CALL ZEROUT (RSTOR(INDEX),LEN)
IDX = INDEX + 2*NUMBER - 1
CALL TIMER (DELT)
CPU = DELT
ELPSD = DELT
RSTOR(IDX-1) = DELT
ISTOR(IDX) = ISTOR(IDX) + 1
NSEG = NUMBER
NOUT = 0
NINR = 0
RETURN
C
C RETURNS ELAPSED CPU TIME
ENTRY CPUTIM(NUMBER)
KGO = 1
NGO = 0

```

```

GO TO 10
C
C PRIMARY LEVEL TIMING FOR OUTER-MOST SUBROUTINES -- E.G. INPUT,TRAN
ENTRY TIMSEG(NUMBER)
KGO = 0
NGO = 1
IF (NUMBER .GT. 0) GO TO 10
WRITE (6,105)
105 FORMAT ('O***** ERROR, ARGUMENT FOR A CALL TO TIMSEG MUST BE G
*REATER THAN ZERO.')
CALL FABEND
C
C OUTER LOOP TIMER, CLOSE INNER INTERVAL IF STILL OPEN
ENTRY TIMEOUT(NUMBER)
KGO = 1
NGO = NUMBER
IF(NGO.NE.0) GO TO 10
WRITE(6,110)
110 FORMAT('O***** ERROR, ZERO IS AN ILLEGAL ARGUMENT FOR A CALL T
*O TIMEOUT')
CALL FABEND
10 IF(NINR.EQ.0) GO TO 20
CALL TIMEL(DELT)
IDX = INDEX + 2*NINR - 2
RSTOR(IDX) = RSTOR(IDX) + DELT
IF (NGO.LE.0) GO TO 20
NINR = 0
20 CALL TIMER(DELT)
IF (NSEG.EQ.0 .AND. NOUT.EQ.0) GO TO 26
IF (NOUT.LE.0) GO TO 25
IDX = INDEX + 2*NOUT - 2
RSTOR(IDX) = RSTOR(IDX) + DELT
25 IDX = INDEX + 2*NSEG - 2
RSTOR(IDX) = RSTOR(IDX) + DELT
26 ELPSD = ELPSD + DELT
CPU = CPU + DELT
I7 = FILIDX(7)
ISUBF = (FILID(7).GT.0.0) .AND. (LDMP(FILIDX(2)).GE.-1)
IF (ISUBF) CPUSEC(I7) = CPUSEC(I7) + DELT
IF (NGO) 60,40,30
30 IDX = INDEX + 2*NUMBER - 1
ISTOR(IDX) = ISTOR(IDX) + 1
IF (KGO .NE. 0) GO TO 35
NSEG = NUMBER
NOUT = 0
RETURN
35 NOUT = NUMBER
RETURN
40 NUMBER = ITIME
RETURN
C
C INNER LOOP TIMER, HAS NO EFFECT ON OUTER LOOP
ENTRY TIMINR(NUMBER)
NGO = NUMBER
IF(NGO.NE.0) GO TO 42
WRITE(6,120)
120 FORMAT('O***** ERROR, ZERO IS NOT A LEGAL ARGUMENT FOR A CALL
*TO TIMINR')
CALL FABEND
42 IF (NUMBER.LT.0) GO TO 45

```

```

      IDX = INDEX + 2*NGO - 1
      ISTORE(IDX) = ISTORE(IDX) + 1
45  CALL TIMEL (DELT)
      IF (NINR.EQ.0) GO TO 50
      IDX = INDEX + 2*NINR - 2
      RSTORE(IDX) = RSTORE(IDX) + DELT
50  NINR = NGO
      IF (NUMBER.LT. 0) NINR = 0
      RETURN
C
C   TIMING ARRAY EDIT ROUTINE
      ENTRY ZTEDIT(NUMBER)
      IZZ = NUMBER
      IGO = 1
      GO TO 55
C
C   PICK UP CPU TIME AND PRINT HEADING
      ENTRY SUBPG(NUMBER)
      IGO = 0
55  NGO = -1
      KGO = 1
      GO TO 10
60  CONTINUE
      I2 = FILIDX(02)
      IDXDOC = FILIDX(10) + 3
      IDXTIT = IDXDOC + 15
C>-----begin RETRAN/MINET code modification-----
ccc  IF (CPU.LT.CPUSAV) IPAGE = 0
      ipage = pageno(+0)
      IPAGE = IPAGE + 1
      ipage = pageno(ipage)
C<-----end RETRAN/MINET code modification-----
      CPUSAV = CPU
      CALL TIME (WALTIM)
      IF (.NOT.IBMRUN) WALTIM = DSL (WALTIM,6)
      WRITE (6,200) (RSTORE(IDXDOC+I),I=1,15), IPAGE
200  FORMAT (1H1,15A8,3X,'PAGE',I5)
      WRITE (6,205) WALTIM
205  FORMAT (' *** EPRI RELEASE 02 -- LIGHT WATER REACTOR TRANSIENT',
*         ' ANALYSIS PACKAGE',43X,A8)
      WRITE (6,210) (RSTORE(IDXTIT+I),I=1,10), CPU
210  FORMAT(1X,10A8,32X,'CPU TIME =',F9.3)
      IF(.NOT.ISUBF) GO TO 65
      IF (NOGO(I7)) WRITE (6,230)
230  FORMAT(80X,10('**'),' ERROR, JOB BEING ABORTED ',10('**'))
65  WRITE (6,240)
240  FORMAT(' * * * * *
1 * * * * *
2 * * * * ')
      IF(IGO.NE.0) GO TO 70
      RETURN
70  WRITE (6,250) ELPSD
250  FORMAT ('O TIMING EDIT   ACCUMULATED TIME =',F9.3,' SECONDS'/)
      WRITE(6,260)
260  FORMAT(' SUBROUTINE',11X,'CPU TIME (SEC)',15X,'PERCENT',5X,
1      ' NUMBER OF CALLS'
2/' *****
3' *****')
      IF (ELPSD.GT.0.0) GO TO 75
      FACT = 0.0

```

```

      GO TO 76
75  FACT = 100.0 / ELPSD
76  DO 80 I=1,NAME
      IDXA = INDEX + 2*I - 2
      PERCNT = RSTORE(IDXA)*FACT
      IF (INOUT(I) .EQ. 0) GO TO 77
      IF (RSTORE(IDXA) .GT. 0.E0)
*      WRITE (6,270) IA(I), RSTORE(IDXA), PERCNT, ISTORE(IDXA+1)
270  FORMAT(4X,A8,8X,F9.3,19X,F7.2,16X,I7 )
      IF ( (I .EQ. 14) .AND. (MODEL(I2) .GE. 4) ) WRITE(6,273)
*      AMPTM(I7), XECTM(I7), SPATM(I7), RESHTM(I7)
273  FORMAT( 6X,'./6X,'. 1-D KINETICS',/6X,'. OPTION',
*/6X,'./6X,'./6X,'.4X,'AMPLITUDE',/6X,'.4X,'FUNCTION',
*3X,F7.2,/6X,'./6X,'.4X,'CROSS-XEC',/6X,'.4X,
*'FORMATION',2X,F7.2,
* /6X,'./6X,'.4X,'SHAP-AMP',/6X,'.4X,
*'ITERATION',2X,F7.2,/6X,'./6X,'.4X,'SHAPE',/6X,
*'.'4X,'FUNCTION',3X,F7.2,/6X,'.')
      GO TO 78
77  CONTINUE
      IF (RSTORE(IDXA) .GT. 0.E0)
*      WRITE (6,271) IA(I), RSTORE(IDXA), PERCNT, ISTORE(IDXA+1)
271  FORMAT(4X,A8,17X,F9.3,17X,F7.2,9X,I7 )
78  CONTINUE
      IF(IZZ.NE.2) GO TO 80
      RSTORE(IDXA) = 0.0
      ISTORE(IDXA+1) = 0
80  CONTINUE
      WRITE(6,280)
280  FORMAT(' * INDICATES OUTER LOOP TIME ' )
      IF (IZZ.NE.2) GO TO 290
      ELPSD = 0.0
      IPAGE = 0
      CPUSAV = 1.E20
290  CONTINUE
C
C   CHECK FOR CALL DUE TO AN ERROR
      IF(IZZ.EQ.1) CALL FABEND
      RETURN
      END

```

```

SUBROUTINE TRAN (IUNIT)
SUBROUTINE TRAN DIRECTS THE PROGRAM FLOW FOR THE RETRAN AND
RESTRT TRANSIENT CALCULATIONS.
TRAN IS CALLED BY SUBROUTINE RETRAN.
IUNIT = TAPE UNIT NUMBER UPON WHICH DATA IS WRITTEN (INPUT)
*CA BKCM
*CA ID02
*CA ID05
*CA ID06
*CA ID07
*CA ID08
*CA ID35
LOGICAL ZTDUMP, TSTAT, MAJC, MINC, PLTC, LABL, PEND, NOTIM
LOGICAL RESRT, NOTSLP
REAL MESSAGE(3,16)

```

```

TR
TR
TR
TR
TR
TR
TR

```

```

C
C>-----begin RETRAN/MINET code modification-----

```

```

*CA ID40
*CA /MININT/
integer dbg
data dbg/22/

```

```

C<-----end RETRAN/MINET code modification-----

```

```

DATA MESSAGE /
* 8H INITIAL, 8HIZATION, 8HERROR.
* 8H FAILU, 8HRE IN PR, 8HESUR.
* 8HPROBLEM, 8HEND TRIP, 8H SIGNAL.
* 8H CPU OR, 8H IO TIME, 8H LIMIT.
* 8H FAIL, 8HURE IN E, 8HDIT.
* 8H FAIL, 8HURE IN P, 8HOWRT.
* 8HFAILURE, 8HIN TS SE, 8HLECTION.
* 8H FAILU, 8HRE IN EN, 8HERGY.
* 8H FAILU, 8HRE IN JU, 8HNPRP.
* 8H FAILU, 8HRE IN AD, 8HVFL0.
* 8H FAILU, 8HRE IN TU, 8HSIN.
* 8H FAILU, 8HRE IN DN, 8HBM.
* 8H FAILU, 8HRE IN DE, 8HRIVS.
* 8H FAILU, 8HRE IN MD, 8HOT.
* 8H FAILU, 8HRE IN CO, 8HNTRL.
* 8H FAILU, 8HRE IN SL, 8HIP.
DATA ZERO / 0. /
DATA SMALL /1.0E-8/
DATA TIMEXN / 0.0 /
CALL TIMSEG(3)

```

```

C
C>-----begin BNL code modification-----

```

```

ccc CALL REMARK(' ENTERED SEGMENT TRAN')
CALL REMARK(' ENTERED SEGMENT TRAN ')

```

```

C<-----end BNL code modification-----

```

```

C
ZTDUMP = .FALSE.

```

```

C
LPD = FILIDX(2)
LSQ = FILIDX(7)

```

```

IDT = FILIDX(35)
DT = DTOLDS(IDT)
DTNEW = DT
IMPCVG(IDT)=.TRUE.
I8=FILIDX(8)
I5 = FILIDX(5)
IS5 = SETSIZ(5)
MS5 = I5 + FILSIZ(5) - 1
I6 = FILIDX(6)
IS6 = SETSIZ(6)
MS6 = I6 + FILSIZ(6) - 1
I2 = FILIDX(02)
NOTSLP = ISFLAG(LPD).LE.0

```

```

C
C
C INITIALIZE TIME STEP TIMER

```

```

START = ZERO
CALL CPUTIM (START)
NTSTRT = NTTSP(IDT)
MULT = 5
IF (INEXPL(I2) .EQ. 1) MULT = 2*MULT
NED = (15 + IABS(NEDI(I2)))/15
IF (NEDI(I2).LT.0) NED = 2*NED
NN = 25
NNN = (NN + NVOL(I2) + NJUN(I2) + NSLB(I2))/NN
MULT = MULT + NNN
IF (LDMP(I2).NE.0) MULT = MULT + 3

```

```

C
C TEST FOR INITIALIZATION ERROR

```

```

I = 0
MAJC = .TRUE.
PLTC = .NOT.NOGO(LSQ) .AND. LDMP(LPD).NE.0
MINC = .TRUE.
LABL = .FALSE.
PEND = .FALSE.
RESRT = .FALSE.
CALL ETSCON
IF (NOGO(LSQ)) GO TO 100
IF (DT.LE.ZERO) GO TO 33
RESRT = .TRUE.
TIMEXN = TIMEX(LSQ)
CALL FLXWG

```

```

C
C INITIALIZATION PATH FOR TIME STEP RESTART

```

```

20 I = 1
IMPSKP(IDT) = .FALSE.
DUMYDT = ZERO
CALL PRESUR(DUMYDT, ITR)

```

```

C
C>-----begin RETRAN/MINET code modification-----

```

```

time=timex(lsq)
if (time.eq.0.0 ) then
timolm = 0.0
delm = 0.0
endif
if (time.ne.timnem) then
delm = time-timnem
timolm = timnem
endif

```

```

timnem=time
if (iprt.ne.0) then
  write(dbg,604)
  write(dbg,605) timex(lsq)
endif
C
604 format(/,' PRESUR CALL DELTM=0 TRAN',
X format(/,' =====')
605 format(' TIMEX(LSQ)=' ,1PE12.5)
C<-----end RETRAN/MINET code modification-----
C
IF (NOGO(LSQ)) GO TO 100
I = 8
IF (RESRT) DTOLDS(IDT) = ZERO
CALL JUNPRP (DUMYDT)
IF (RESRT) DTOLDS(IDT) = DT
IF (NOGO(LSQ)) GO TO 100
I = 12
IF (NOGO(LSQ)) GO TO 100
IF (RESRT) GO TO 25
DTTEST = DTOLDS(IDT)
DTOLDS(IDT) = DT
IF (DTTEST.LT.ZERO) GO TO 25
MINC = .FALSE.
MAJC = .FALSE.
PLTC = .FALSE.
LABL = .FALSE.
PEND = .FALSE.
ZTDUMP = .FALSE.
25 CONTINUE
ITR = 0
IF(.NOT. RESRT) GO TO 62
RESRT = .FALSE.
IF (INEXPL(LPD).EQ.1) CALL SAVIMP
GO TO 33
C
C TOP OF TIME STEP LOOP - COEFFICIENTS ARE AT TIME STEP N
C SOLVE FOR MASS, ENERGY AND FLOW FOR TIME STEP N+1, THEN
C UPDATE POWER, CONDUCTION AND COEFFICIENTS TO TIME STEP N+1
C
C GET NEW TIME STEP
C
50 CONTINUE
I = 6
IF (INEXPL(I2) .EQ. 1) DTOLDS(IDT) = DTNEW
DT = TSTP (MAJC,MINC,ZTDUMP,PLTC)
TIMEXN = TIMEX(LSQ)
IF (NOGO(LSQ)) GO TO 100
IF (INEXPL(I2) .EQ. -1) GO TO 62
C
CALL SAVIMP
ITR = 0
62 CONTINUE
C
UPDATE STATUS OF ALL TRIPS
CALL TRIP
63 CONTINUE
IF (INEXPL(I2).NE.-1) ITR = ITR + 1
C

```

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```

C CALCULATE EFFECTS OF CONTROL SYSTEM
IF (ICF(LPD).NE.1) GO TO 70
I = 14
DTCMAX=RSTOR(FILIDX(54)+9)
TIME=TIMEX(LSQ)
TIMEX(LSQ)=TIME-DT
N = (DT-SMALL)/DTCMAX
N=N+1
DTC=DT/N
IFIRST = 1
DO 75 K=1,N
TIMEX(LSQ)=TIMEX(LSQ)+DTC
CALL CONTRL (1,NTTSP(IDT),TIMEX(LSQ),DTC,IFIRST,DT)
75 IFIRST = 2
TIMEX(LSQ)=TIME
IF (NOGO(LSQ))GOTO 100
70 CONTINUE
C
C-----begin RETRAN/MINET code modification-----
iget=1
iset=2
time=timex(lsq)
if (time.eq.0.0 ) then
  timolm = 0.0
  deltm = 0.0
endif
if (time.ne.timnem) then
  deltm = time-timnem
  timolm = timnem
endif
timnem=time
idx02=filidx(02)
idx06=filidx(06)
idx40=filidx(40)
isiz06=setsiz(06)
njun1 =njun(idx02)
inpsi =ixnpsi(idx40)
mjunf1=mjunf(idx40)
C
COM =====
COM GET PARAMETERS FROM RETRAN TRANSIENT CALCULATION
COM TO PASS TO MINET TRANSIENT CALCULATION
COM =====
C
if (iprt.ne.0) then
  write(dbg,602)
  write(dbg,605) timex(lsq)
endif
C
COM -----
COM LOOP OVER FILL JUNCTIONS (IF ANY)
COM -----
C
if (mjunf1.le.njun1) then
  do 880 jun=mjunf1,njun1
    ipsi = npsi(inpsi+jun-1)
    i = idx06 + (ipsi-1)*isiz06
  call fillm(i,iget)
C

```

```

880  continue
      endif
      if (iprt.ne.0) then
        write(dbg,603)
        write(dbg,605) timex(lsq)
      endif
c
      if (ntdv(idx02).gt.0) call tdv(iget)
c
c
COM  =====
COM  MINET TRANSIENT LINK CALLED
COM  MINET TRANSIENT CALCULATION
COM  PARAMETERS PASSED THROUGH COMMON MINRAN
COM  =====
c
      if (iprt.ne.0) write(dbg,1601)
c
      call stlink(1)
c
COM  =====
COM  SET PARAMETERS FOR RETRAN TRANSIENT CALCULATION
COM  THEY CAME FROM MINET TRANSIENT CALCULATION
COM  =====
c
      if (iprt.ne.0) then
        write(dbg,1602)
        write(dbg,605) timex(lsq)
      endif
c
COM  =====
COM  LOOP OVER FILL JUNCTIONS (IF ANY)
COM  =====
c
      if (mjunf1.le.njun1) then
        do 1880 jun=mjunf1,njun1
          ipsi = npsi(inpsi+jun-1)
          i    = idx06 + (ipsi-1)*isiz06
c
          call fillm(i,iset)
c
1880  continue
      endif
      if (iprt.ne.0) then
        write(dbg,1603)
        write(dbg,605) timex(lsq)
      endif
c
      if(ntdv(idx02).gt.0) call tdv(iset)
c
COM  =====
COM  6 MAY 87 - NO SUBSTITUTE FOR TAPEBC NECESSARY EITHER
COM  HERE OR IN INVOL,PRESUR, OR RESOPT.
COM  TAPEBC READS A RETRAN DATA TAPE TO GET MTDV SETS OF
COM  PREVIOUSLY CALCULATED VOLUME QUANTITIES. FILE 42 IS
COM  CREATED FROM DATA ON THE TAPE AND CONTAINS
COM  TIMNEM      TIMOLM
COM  POWNEW      POWOLD
COM  IVOLN = VOL. NUMBER OF VOL. DATA RETRIEVED (MTDV SUBFILES)
COM  PNEW        POLD
COM  TNEW        TOLD

```

```

COM  XNEW      XOLD
COM  ZNEW      ZOLD
COM  AS SEQUENTIAL DATA ON THE DATA TAPE. WE DO NOT PERMIT
COM  ANY OF THESE OLD SUBFILES VOLUME HISTORIES TO BE THE COUPLING
COM  VOLUME BETWEEN RETRAN AND MINET. WE MUST ALWAYS SPECIFY
COM  A COUPLING VOLUME AS CARD INPUT WITH DUMMY DATA.
COM  -----

```

```

c
602 format(/,' FILLM CALLS FROM TRAN GET SEQUENCE',
x         /,' =====')
603 format(/,' TDV  CALLS FROM TRAN GET SEQUENCE',
x         /,' =====')
1601 format(/,' =====',
x          /,' STLINK CALL FROM TRAN TO GET LINK PARAMETERS',
x          /,' =====')
1602 format(/,' FILLM CALLS FROM TRAN SET SEQUENCE',
x         /,' =====')
1603 format(/,' TDV  CALLS FROM TRAN SET SEQUENCE',
x         /,' =====')
C<-----end RETRAN/MINET code modification-----
c
C  GET NORMALIZED POWER
c
      IF (NCOR(LPD).LE.0 .OR. DT.LE.ZERO) GO TO 65
      I = 5
c
      DO THE POWER CALCULATION AT END OF THE LOOP IF NODEL .GT. 4
      IF ( NODEL(LPD) .GE. 4 ) GO TO 65
      PNORM(LSQ) = POWRT(NODEL(LPD),DT,MINC,MAJC)
      POWER(LSQ) = POWRI(LSQ) * PNORM(LSQ)
      IF(NOGO(LSQ)) GO TO 100
c
c
      GET NEW ENERGY TRANSFER RATES
65 IF(NSLB(LPD).LE.0 .AND. NHTX(LPD).LE.0
*   .AND. NTSH(LPD).LE.0) GO TO 80
      I = 7
      CALL ENERGY (DT,2)
      IF (NOGO(LSQ)) GO TO 100
c
c
      TURBINE SPEED INTEGRATION.
c
      I = 10
      IF(NTSH(I2) .GT. 0) CALL TUSIN(DT)
      IF (NOGO(LSQ)) GO TO 100
c
c
      AUXILIARY DNB CALCULATION
      IF (IDNBC(LPD).LE.0) GO TO 80
      I = 11
      IF(MAJC.OR.MINC.OR.PLTC) GO TO 68
      GO TO 80
68 CALL DNBM
      IF(NOGO(LSQ)) GO TO 100
80 CONTINUE
c
c
      GET JUNCTION PROPERTIES
c
      I = 8
      IMPSKP(IDT) = .FALSE.
      CALL JUNPRP (DT)
      IF (NOGO(LSQ)) GO TO 100

```

```

C      IF(INEXPL(I2) .EQ. -1) IMPSKP(IDT) = .FALSE.
C      IF (IMPSKP(IDT)) GO TO 20
C
C      GET NEW TIME VALUE OF VSLIP AND SLP CNV
C
C      IF (ISFLAG(I2) .LE. 0) GO TO 71
C      I = 15
C      CALL SLIP (DT)
C      IF (NOGO(LSQ)) GO TO 100
71 CONTINUE
C
C      COMPUTE VAPOR MASS GENERATION RATES AND LIQUID ENERGY EQUATION
C      SOURCE TERMS WHEN APPLICABLE
C
C      IF (NEWEQS(LPD) .LE. 0) GO TO 72
C      I = 13
C      CALL MDOT (DT)
C      IF (NOGO(LSQ)) GO TO 100
72 CONTINUE
C
C      COMPUTE EXPLICIT MASS AND ENERGY DERIVATIVE FOR NEXT ITERATION
C
C      I = 12
C      CALL DERIVS
C      IF (NOGO(LSQ)) GO TO 100
C
C      GET NEW JUNCTION FLOWS
C
C      I = 9
C      CALL ADVFLO (DT)
C      IF (NOGO(LSQ)) GO TO 100
C      IF (INEXPL(I2) .EQ. -1) GO TO 90
C      IMPCVG(IDT) = .FALSE.
C      IF (IMPSKP(IDT)) GO TO 20
C
C      DO VOLUME THERMODYNAMIC BALANCE
C
C      90 I = 1
C      IF (INEXPL(I2) .EQ. -1) IMPCVG(IDT) = .TRUE.
C      CALL PRESUR (DT, ITR)
C      IF (NOGO(LSQ)) GO TO 100
C      IF (INEXPL(I2) .EQ. -1) GO TO 95
C      IF (IMPSKP(IDT)) GO TO 20
C
C      CALL IMPSTP(DT,DTNEW,DUM,4,IDUM,ITR)
C      IF (NOGO(LSQ)) GO TO 100
C      IF(IMPSKP(IDT)) GO TO 20
C      IF (.NOT.IMPCVG(IDT)) GO TO 63
C
C      COMPUTE SYSTEM POWER USING 1-D KINETICS IF THE OPTION IS USED.
C
C      95 IF ( NODEL(LPD) .LT. 4 ) GO TO 33
C      I = 5
C      PNORM(LSQ) = POWRT(NODEL(LPD),DT,MINC,MAJC)
C      POWER(LSQ) = POWRI(LSQ) * PNORM(LSQ)
C      IF (NOGO(LSQ)) GO TO 100
C
C      END OF PROBLEM TEST
C      33 I = 2
C      IF (TSTAT(1,DUM)). GO TO 100

```

```

C
C      CHECK REMAINING CPU AND IO TIME
C      I = 3
C      CALL CPUTIM (ELAPSD)
C      NSTPS = NTTSP(IDT) - NTSTRT
C      IF (NSTPS.EQ.0) NSTPS = 1
C      MED = NED*(NSTPS + 500)/500
C      MULT = MULT + MED
C      TIMCPU = (ELAPSD - START)/NSTPS
C      TIMCPU = TIMCPU*MULT + 1.0
C      TIMIO = 2.0 * TIMCPU
C      IF (NOTIM(TIMCPU,TIMIO)) GO TO 100
C
C      IF (TIMEXN .EQ. TIMEX(LSQ)) GO TO 32
C
C      TIME STEP HAS BEEN HALVED RESET EDIT FLAGS SET IN TSTP
C
C      MINC = .FALSE.
C      MAJC = .FALSE.
C      PLTC = .FALSE.
C
C      DO EDITS IF NECESSARY
C      32 PLTC = PLTC .AND. LDMP(LPD).NE.0
C      I = 4
C      35 IF (MAJC .OR. MINC .OR. PLTC .OR. LABL)
C      *CALL EDIT (MAJC,MINC,PLTC,LABL,PEND,IUNIT)
C      WRITE TRIP STATUS
C      CALL TEDIT
C      IF (NOGO(LSQ)) GO TO 210
C      ZTDUMP = PEND.OR.ZTDUMP
C      IF (.NOT.ZTDUMP) GO TO 36
C      CALL ZTEDIT (0)
C      CALL ETSCON
C      36 IF (.NOT.PEND) GO TO 50
C      GO TO 210
C
C      END OF PROBLEM
C      100 MAJC = .TRUE.
C      PLTC = LDMP(LPD).NE.0
C      PLTC = PLTC .AND. (NTTSP(IDT).GT.0)
C      MINC = .TRUE.
C      LABL = PLTC
C      PEND = MINC
C      GO TO 35
C
C      DO FINAL EDIT AND RETURN
C      210 CALL SUBPG (DUM)
C      I = I + 1
C      WRITE (6,600) (MESSAGE(J,I),J=1,3)
C      IF (I.LE.1) GO TO 220
C      CALL ZTEDIT (2)
C      CALL ETSCON
C      220 CONTINUE
C      RETURN
C
C      600 FORMAT (15(1H0/),54X,3A8)
C      END

```

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6. EXECUTING THE RETRAN/MINET COMPOSITE ON THE IBM-3090 COMPUTER

The RETRAN/MINET Composite Code, specifically the version using RETRAN-02 MOD4, is currently being executed on IBM-3090's (Models 180 and 300E, Running VM-HPO and VM-XA) at BNL. As similar machines are known to be available to some of the ESEERCO member utilities, the IBM-3090 is believed to be an appropriate host computer for at least the near term.

Export of the Composite Code will be via computer tapes and reference documentation(s) and reports. As the RETRAN code is licensed by EPRI, the export of the Composite Code will be via export of the applicable version of MINET and the set of code "updates" (to RETRAN and MINET) that links the codes. The user will then implement the updates, using system software residing on the new host computer (Historian or other "update" system) to link RETRAN and MINET. While this process is not trivial, it should not require much manpower, if the required expertise is available (i.e., find an expert on the host computer's system software and the work should be completed before the engineers have time to finish reading the documentation). Included on the tape will be some test cases, and newly installed versions of the Composite Code should be checked before applications begin.

While the IBM-3090 is the current host site for the Composite Code, the initial version, using RETRAN-02 MOD 3, was developed on a CDC Cyber 860 machine. Because of memory restrictions and other limitations, this is a difficult host computer. However, the fact that the Composite Code has been utilized on two computers as different as the CDC Cyber 860 and the IBM-3090 suggests that the Composite Code could be implemented on most mainframe computers. Further, MINET itself has been run on many computers, including at least one desk-top microcomputer. Therefore, any limitations regarding host computers are likely to come from RETRAN, which implies that if RETRAN currently executes on a given computer, then it is very likely that RETRAN/MINET could be run on the same machine.

A sample REXX "executive" file, which is used to execute RETRAN/MINET on the BNL IBM-3090, is listed on the pages that follow. This EXEC, while not necessary, may be useful to other IBM installations not running the VM operating system.


```

'STATE' rn rt
IF RC /= 0 THEN DO
  SAY 'Cannot find RETRAN input file' rn rt rm
  EXIT
  END
ELSE DO
  'smode' rn rt
  PULL rm .
END
opt = opt||' R= 'rn rt

nn = ''
IF DATATYPE(sn,'W') = 1 THEN DO
  nn = sn
END
IF nn /= '' THEN DO /* nn must be a whole number < 99 */
  IF DATATYPE(nn,'W') = 1 & nn < 99 THEN DO
    st = 'RSTRT' || right(nn,2,'0')
    sn = rn
  END
  ELSE DO
    SAY 'Attempt to use invalid RETRAN restart file number' nn
    EXIT
  END
END
ELSE DO
  IF sn = '' THEN DO
    sn = rn
    st = 'RSTRTOO'
  END
  ELSE SAY 'Using RETRAN restart file ' sn st
END
opt = opt||' S= 'sn st

'STATE' mn mt
IF RC /= 0 THEN DO
  SAY 'Cannot find MINET input file' mn mt mm
  EXIT
  END
ELSE DO
  'smode' mn mt
  PULL mm .
END
opt = opt||' M= 'mn mt

nn = ''
IF DATATYPE(tn,'W') = 1 THEN DO
  nn = tn
END
IF nn /= '' THEN DO /* nn must be a whole number < 99 */
  IF DATATYPE(nn,'W') = 1 & nn < 99 THEN DO
    tt = 'RSTRT' || right(nn,2,'0')
    tn = mn
  END
  ELSE DO
    SAY 'Attempt to use invalid MINET restart file number' nn
    EXIT
  END
END
ELSE DO

```

```

IF tn = '' THEN DO
  tn = mn
  tt = 'RSTRTOO'
END
ELSE SAY 'Using MINET restart file ' tn tt
END
opt = opt||' T= 'tn tt

IF pn = '' THEN DO
  pn = mn
END
IF pt = '' THEN DO
  pt = 'MPLOTOO'
END
opt = opt||' P= 'pn pt

'BATCH SUBMIT (SEND " " rn      rt      rm      "'',
              'SEND " " mn      mt      mm      "'',
              bs,
              'GIME "retrmin c " options,
              'STOR 12M TIME 10 PR 100 PU 250 ',
              'CLEANUP "kleanup" ',
              'NORETURN "scratch *")',
              'retrmin' opt

EXIT
END /* End of interactive processing */

/* Following things done in BATCH only. */

MAKEBUF
jbuf=rc
'namefind :NICK jobname :value (FILE batchsub STACK'
PULL jobnam .

len = length(st)
ni=SUBSTR(st, 6, len)
IF DATATYPE(ni,'W') = 1 & ni < 98 THEN DO
  no=right(ni+1,2,'0')
  len = len-2
END
ELSE DO
  no='01'
  len=min(len,6)
END
sno = rn
sto = SUBSTR(st,1,len)||no
sto = 'RSTRT'||no
SAY '...Generating RETRAN restart file 'sno sto

len = length(mt)
ni=SUBSTR(mt, 6, len)
IF DATATYPE(ni,'W') = 1 & ni < 98 THEN DO
  no=right(ni+1,2,'0')
  len = len-2
END
ELSE DO
  no='01'
  len=min(len,6)
END

```

```

mno = mn
mto = SUBSTR(mt,1,len)||no
mto = 'RSTRT' ||no
SAY '...Generating MINET restart file 'mno mto

```

```

len = LENGTH(pt)
ii=SUBSTR(pt, 6, len)
IF DATATYPE(ii,'W') = 1 & ii = 0 THEN DO
  len = len-2
  pt = SUBSTR(pt,1,len)||no
END
SAY '...Generating MINET plot file 'pn pt

```

```

'SUID'          /* Get userid for submitter */
PULL user .
DROPBUF jbuf

```

```

trace r
'GLOBADD TXTLIB retran retrenv minet'
'SET LDRTBLS 15'

```

```

'GIME scratch e'
'GIME 25 f'
'GIME dissp'
'calcomp'
'Q TXTLIB'

```

```

'FILEDEF      1 DISK scratch tmp1 f'
'FILEDEF      2 DISK scratch tmp2 f'
'FILEDEF      3 DISK scratch tmp3 f'
'FILEDEF      4 DISK scratch tmp4 f'
'FILEDEF      5 DISK ' rn rt
'FILEDEF      6 DISK ' jobnam 'listing '
'FILEDEF      8 DISK scratch tmp8 f'
'FILEDEF      9 DISK ' mn mt
'FILEDEF     11 DISK retran11 data f (recfm vs lrecl 7292 blksize 7296'
'FILEDEF     12 DISK retran12 data f (recfm vs lrecl 7292 blksize 7296'
'FILEDEF     13 DISK ' sn st 'e (recfm vs lrecl 7292 blksize 7296'
'FILEDEF     14 DISK ' sno sto 'e (recfm vs lrecl 7292 blksize 7296'
'FILEDEF ftb15f01 DISK (recfm fs blksize 23220'
'FILEDEF ftb16f01 DISK (recfm fs blksize 23220'
'FILEDEF ftb17f01 DISK (recfm fs blksize 23220'
'FILEDEF ftb18f01 DISK (recfm fs blksize 23220'
'FILEDEF     22 DISK 'jobnam 'intrfdbg e (recfm f lrecl 133'
'FILEDEF     31 DISK scratch SCR1 f'
'FILEDEF     32 DISK scratch SCR2 f'
'FILEDEF     33 DISK ' pn pt 'e (recfm vbs'
'FILEDEF     34 DISK ' tn tt 'e (recfm vbs'
'FILEDEF     35 DISK ' tno tto 'e'
'FILEDEF     81 DISK scratch tmp81 f'

```

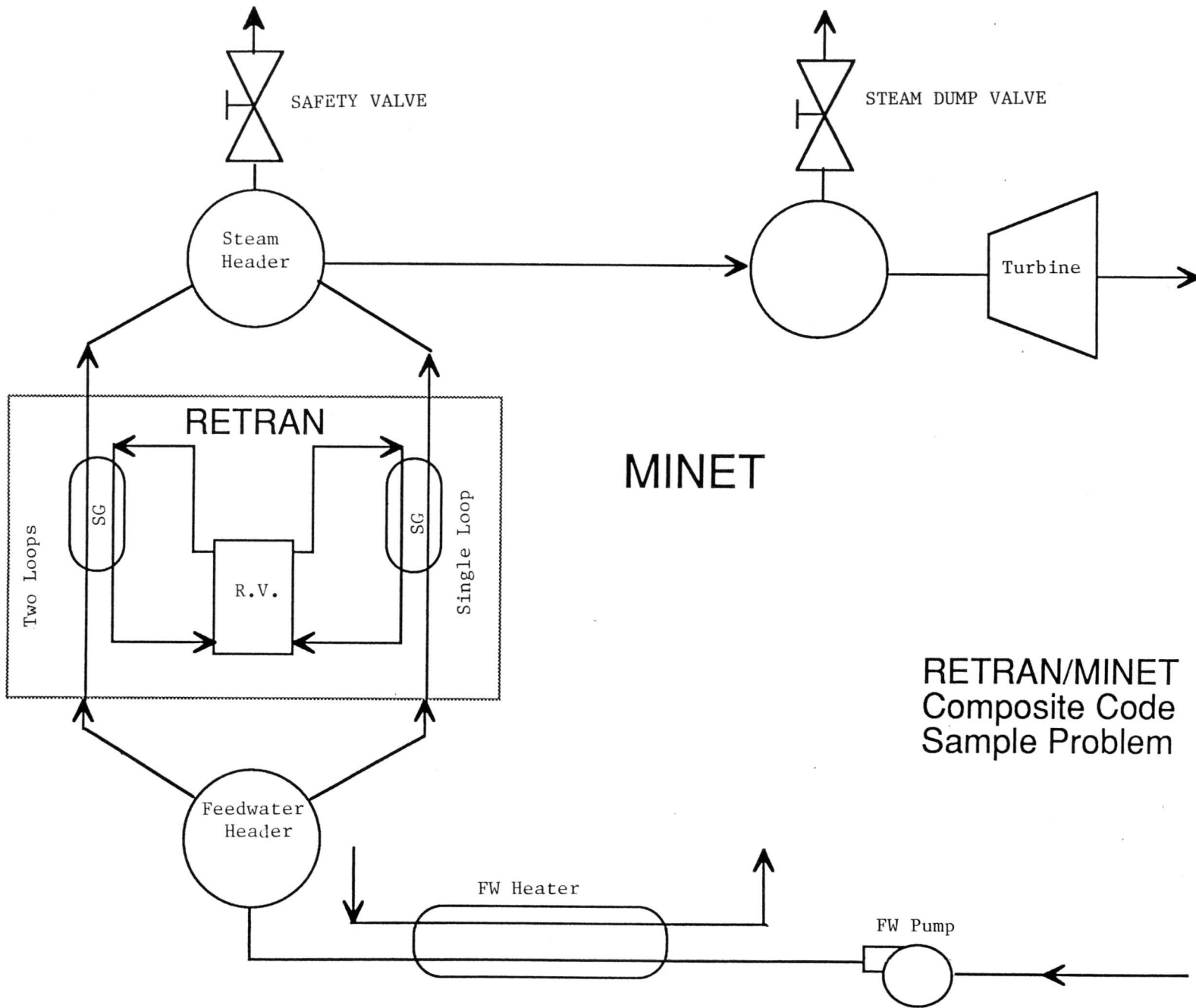
```

'retrmin'
'q disk'
'EXIT'

```

7. SAMPLE INPUT DECKS AND PRINT-OUT

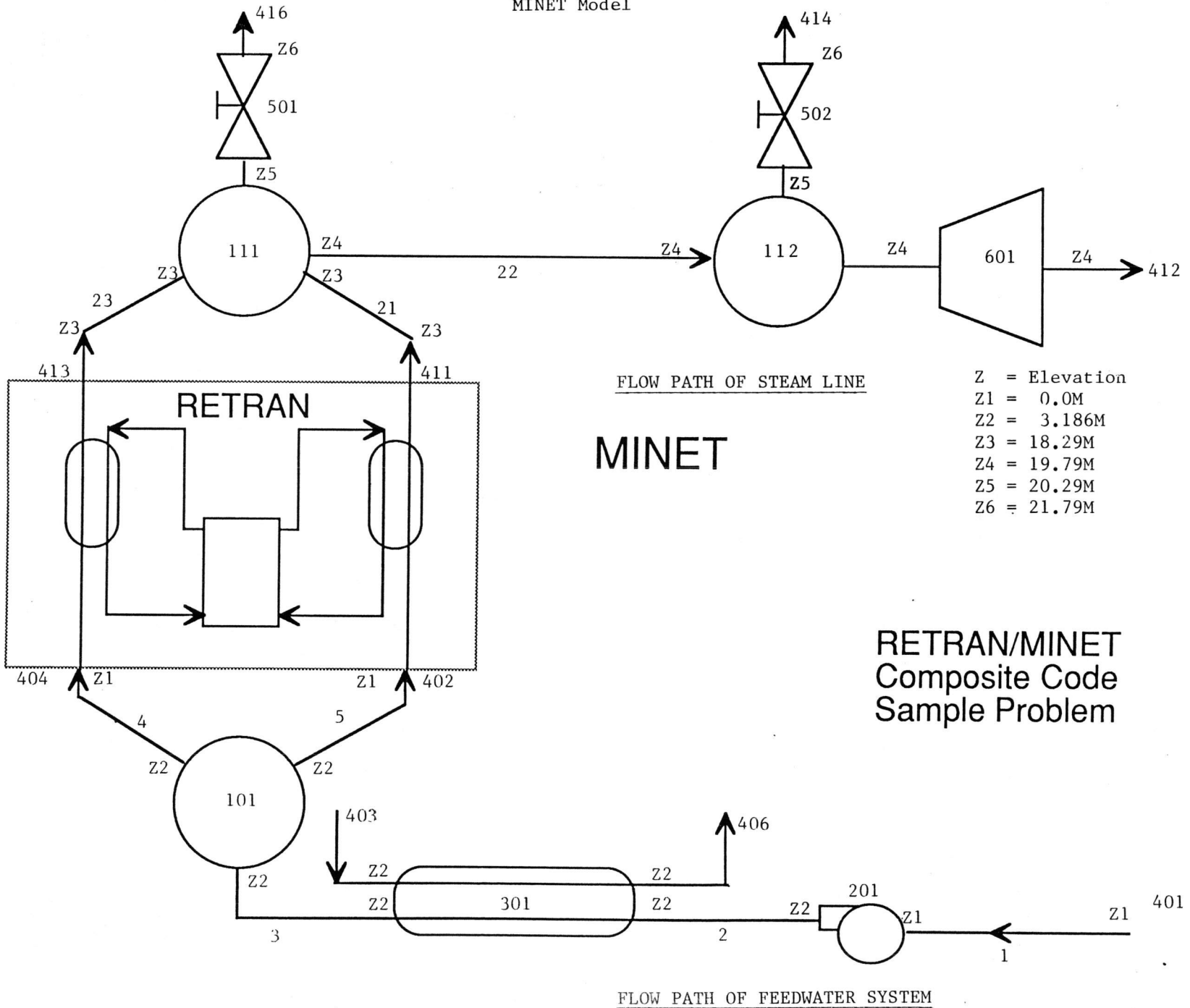
A sample problem, free of proprietary data, was prepared for inclusion in the documentation as well as the code workshop. The system is a variation on the H. B. Robinson representation used in a validation study. The system configuration is shown in Figure 7-1, with additional information regarding MINET module identification numbers provided in Figure 7-2. Data for the MINET portion of the system is provided in Tables 7-1 through 7-7. RETRAN system identification numbers are indicated in Figure 7-3. The corresponding RETRAN input deck is listed in Figure 7-4. The MINET input deck, consistent with Figure 7-2, is shown in Figure 7-5. The brief linkage input deck shown in Figure 7-6 includes both linkages shown in Figures 7-1 and 7-2. Key sections of the RETRAN/MINET calculation print-out are shown in Figure 7-7.



RETRAN/MINET
Composite Code
Sample Problem

Figure 7-1

Figure 7-2 RETRAN/MINET Sample Problem
MINET Model



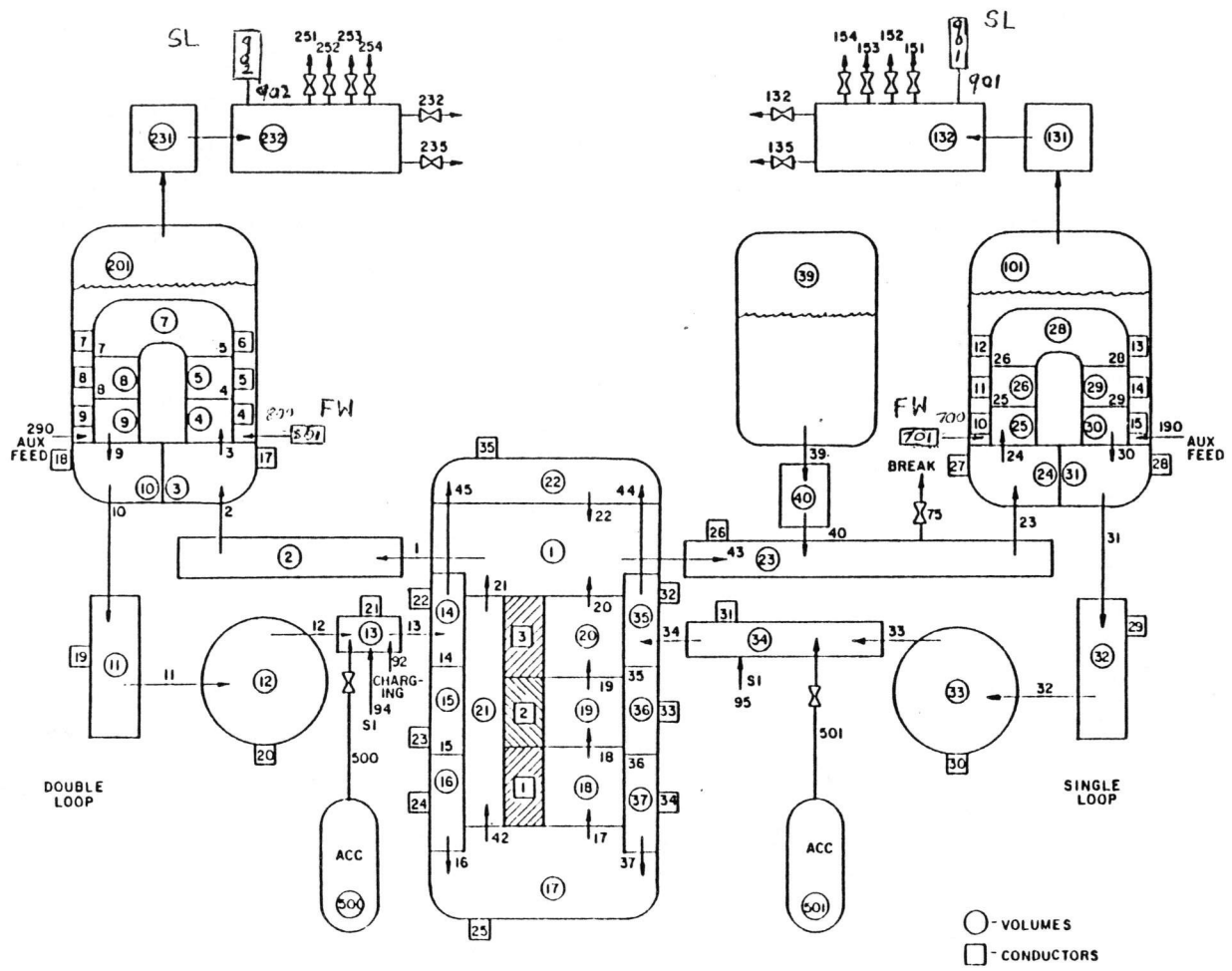


Figure 7-3 Nodalization Diagram of the H. B. Robinson RETRAN Model

Table 7-1

GEOMETRY

PIPING - Unheated

<u>Pipe No.</u>	<u>Length M</u>	<u>Dia. M</u>	Surface Roughness <u>ϵ/D</u>	<u>Unit</u>	<u>Nodes</u>	<u>No. of Fk</u>
1	0.5	0.443	1.5E-5	1	1	0.0
2	10.8	0.443	"	1	1	9.37
3	22.15	0.443	"	1	2	10.31
4	50.53	0.353	"	2	3	10.31
5	50.53	0.353	"	1	3	10.31
21	0.1	0.605	"	1	1	0.0
22	27.63	0.68	"	3	3	0.0
23	0.1	0.605	"	2	1	0.0

Table 7-2

VALVES 501, 502 CLOSED

Length of pipe-like portion = 1.2 M

Diameter of pipe-like portion = 0.605 M

Maximum flow area = 0.287M^2

Surface roughness = $1.5\text{E-}4$

Flow rate set to 0.001 Kg/Sec. (closed)

Table 7-3

PUMP 201 Constant speed no heat input

Length of pipe-like portion = 3.186M

Diameter of pipe-like portion = 0.353M

Surface roughness = 1.15E-5

No. of units = 2

Reference pump head = 577.492M

Reference flow rate = 704.057 Kg/Sec.

Reference pump speed = 3570.0 RPM

A3pump (1)	1.2772
(2)	-0.6397
(3)	1.2513
(4)	-1.1053
(5)	0.2167

Coastdown constant = 5.0 Sec.

Seizure time after trip = 20.0 Sec.

Table 7-4

HEAT EXCHANGER 301 Straight tube counter flow

Length of Hx tubes: 12.67 M
Tube inside Dia. : 0.0144
Surface roughness: 4.5E-6

Tube outside Dia.: 0.015875
Pitch Dia. ratio: 2.0137
No. of tube in Hx: 2100

Structure-fluid surface area: 941.0M²
Mass of structure: 2.84E4 Kg
No. of unit: 1
No. of node: 1

Heat transfer to Feedwater: 207.2E6 J/Sec.

Tube side loss coeff. = 0.5
Shell side loss coeff.= 0.5

No core tubes
6 tubes are equidistant from central tube
MacBeth CHF inside tubes

Table 7-5

VOLUME - Horizontal cylinder, no heat source or heat sink

<u>Volume No.</u>	<u>Volume</u> ³ (M)	<u>High (M)</u>	<u>Elevation Mid. Point</u>	<u>No. of Unit</u> (M)
101	35.34	3.0	3.186	1
111	35.34	3.0	19.79	1
112	35.34	3.0	19.79	1

Table 7-6

TURBINE 601 Single State

Angle of approach steam = 15°

Efficiency = 95%

Reference inlet/outlet pressures = 5.2/3.892 MPA

Reference flow rate = 1272.61 Kg/Sec.

Reference temperature = 544.5 K

Reference speed = 1800 RPM

Coastdown time constant = 8.0 Sec.

Seizure time after trip = 20 Sec.

Work done on turbine stage = $113.0E7$ J/Sec.

Table 7-7

BOUNDARY CONDITIONS (steady state and transient)

INLET BOUNDARY CONDITIONS

- 401 1272.61 Kg/Sec. of water with enthalpy of 8.0847E5 J/Kg
- 403 181.93 Kg/Sec. of steam with enthalpy of 2.74E6 J/Kg
- 411 424.202 Kg/Sec. of steam with enthalpy of 2.7872E6 J/Kg
- 413 848.404 Kg/Sec. of steam with enthalpy of 2.7872E6 J/Kg

OUTLET BOUNDARY CONDITIONS

- 402 Water exiting system at 5.7725MPA and enthalpy 9.7126E5 J/Kg
- 404 Water exiting system at 5.7725 MPA and enthalpy 9.7126E5 J/Kg
- 406 Steam exiting Hx at 4.2 MPA and enthalpy 1.6E6 J/Kg
- 412 Steam exiting system at 3.892 MPA and enthalpy 1.89E6 J/Kg
- 414 Steam quality 0.9975 at 4.89 MPA flow rate set to 0.001 Kg/Sec. (closed)
- 416 Steam quality 0.99075 at 5.0 MPA flow rate set to 0.001 Kg/Sec. (closed)

Figure 7-4
Sample Problem
RETRAN Input Deck

= SAMPLE PROBLEM SB LOCA HOTLEG

*
* THIS IS A BEST ESTIMATE MODEL TO HANDLE A SMALL BREAK LOCA IN THE
* LOOP WITH THE PRESURIZER. THE BREAK SIZE IS THREE INCHES IN DIAMETER.
* THE FOLLOWING ASSUMPTIONS HAVE BEEN MADE TO MAKE THE RESULTS AS
* CONSERVATIVE AS PRACTICAL WHILE STILL MAINTAINING A BEST ESTIMATE
* MODEL.
* 1. THE HOT LEG IS THE BREAK LOCATION
* 2. TWO CHARGING PUMPS EACH PROVIDING MAXIMUM FLOW AT 40 DEGREES F
* 3. THREE SI PUMPS CURVE CONTROLLED PROVIDING 40 DEGREE F. FLOW
* 4. 400 GPM/SG AUX FEED FLOW AT 40 DEGREES F.
* 5. STEAM DUMP BASED ON NO-LOAD TAVE
* 6. ONE NODE SECONDARY IN THE STEAM GENERATOR
* 7. BEGINNING OF LIFE DECAY HEAT 0.001 ANS CURVES.

*10001 LDMP NEDI NTC NTRP NVOL NBUB NTDV NJUN NPMP NCKV NLK NFLL NSLB NGOM
010001 0 +11 2 34 46 5 1 69 2 1 4 20 35 9
*10002 NMAT NCOR NHTX NTMN NODEL MWREAC NLVC MTDV ISFLAG NCHT JSST IPRZR
010002 6 3 0 0 0 0 0 0 1 0 0 0 1
*10003 ITRNS IDNBC ICF IHTMAP ICSVL INCSCD INEXPL NSTK NTSH IVOID NFIT JFLAG
010003 0 0 0 1 1 0 0 -1 4 0 0 0 0
*10004 NEQS NSEPR
010004 0 0
*10005 POWER
010005 2300.0
**

010140 RETRAN1
*10141 "NDSCR1" "GE"

***** MINOR EDITS

020000 COUT -25 TRIP 30 COUT -15 COUT -16 COUT -23 COUT -24
020001 WP** 1 PRES 39 WP** 13 WP** 100 WP** 43 WP** 34 WP** 190
020002 WP** 200 WP** 201 WP** 290 WP** 95 WP** 94
020003 WP** 92 PRES 101 PRES 201 TEMP 23 TEMP 34
020004 TEMP 2 TEMP 13 PNRM 0 AVED 23 WQ** 101
020005 WQ** 201 LIQL 101 LIQL 201 LIQL 39
020006 TEMP 14 TEMP 16 TEMP 35 TEMP 37
020007 WP** 75 TRIP 16 WP** 901 WP** 902 PRES 901 PRES 902
020008 PRES 23 HP** 200 HP** 100 HW** 101 HW** 201
020009 PRES 701 PRES 801 WP** 700 WP** 800

** TIME STEPS

*3XXX0 NMIN NMAJ VPMP NCHK DELTM DTMIN TLAST EPSP EPSIMP EPST EPSCHG NSHAP
030010 1 1 10 0 0.001 0.0005 0.001
030010 1 1 1 0 1.0 0.001 50.0
*30*30 20 10 1 0 0.1 0.00001 2010.0 0.07 0.004

** TRIP CONTROLS

*4XXX0 IDTRP IDSIG IX1 IX2 SETPT DELAY
040010 1 1 0 0 25.0 0.0 * END PROBLEM ON ELAPSE TIME
040020 2 -4 39 0 1730. 5.0 * SI TRIP
040030 3 1 0 0 0.0 0.0 * FEEDWATER 1 START

040040	4	1	0	0	0.0	0.0	*	STEAMFLOW 1 START
040050	5	4	132	0	1089.0	0.0	*	STEAM1SAFETY1 LO OPEN
040060	-5	-4	132	0	1045.0	0.0	*	STEAM1SAFETY1 RESET LG BLOW
040070	6	4	132	0	1114.0	0.0	*	STEAM1SAFETY2 OPEN
040080	-6	-4	132	0	1069.0	0.0	*	STEAM1SAFETY2 RESET
040090	7	4	132	0	1128.0	0.0	*	STEAM1SAFETY3 OPEN
040100	-7	-4	132	0	1083.0	0.0	*	STEAM1SAFETY3 RESET
040110	8	4	132	0	1143.0	0.0	*	STEAM1SAFETY4 OPEN
040120	-8	-4	132	0	1097.0	0.0	*	STEAM1SAFETY4 RESET
040130	9	1	0	0	0.0	0.0	*	FEEDWATER 2 START
040140	10	1	0	0	0.0	0.0	*	STEAMFLOW 2 START
040150	11	4	232	0	1089.0	0.0	*	SAFETY 1 STEAM 2
040160	-11	-4	232	0	1045.0	0.0	*	SAFETY 1 STEAM 2 CLOSE
040170	12	4	232	0	1114.0	0.0	*	SAFETY 2 STEAM 2
040180	-12	-4	232	0	1069.0	0.0	*	SAFETY 2 STEAM 2 CLOSE
040190	13	4	232	0	1128.0	0.0	*	SAFETY 3 STEAM 2
040200	-13	-4	232	0	1083.0	0.0	*	SAFETY 3 STEAM 2 CLOSE
040210	14	4	232	0	1143.0	0.0	*	SAFETY 4 STEAM 2
040220	-14	-4	232	0	1097.0	0.0	*	SAFETY 4 STEAM 2 CLOSE
040230	15	1	0	0	0.01	5.0	*	BREAK START
040240	16	-4	39	0	1859.0	1.0	*	SCRAM-RCP TRIP
040250	-3	12	16	0	0.0	2.0	*	FEEDWATER 1 STOP
040260	-4	12	16	0	0.0	2.0	*	STEAMFLOW 1 STOP
040270	-9	12	16	0	0.0	2.0	*	FEEDWATER 2 STOP
040280	-10	12	16	0	0.0	2.0	*	STEAMFLOW 2 STOP
040290	17	-5	101	0	33.93	0.0	*	AUXFEED 1 LOLVL START
040300	18	-5	201	0	33.93	0.0	*	AUXFEED 2 LOLVL START
040310	19	13	17	16	0.0	2.0	*	AUXFEED1LOLVL & SCRAM
040320	20	13	18	16	0.0	2.0	*	AUXFEED2LOLVL & SCRAM
040330	-19	6	101	0	41.08	0.0	*	AUXFEED 1 HILVL STOP
040340	-20	6	201	0	41.08	0.0	*	AUXFEED 2 HILVL STOP

* VOLUME DATA

*5XXX1	IBUB	IREAD	PRESS	TEMP	QUALITY	VOLUME	ZVOL	ZM	*
*5XXX2	FLOWL	FLOWA	DIAMV	ELEV	INEQ	VRAIN	VLHTC	IPVBUB	MESH
050011	0	0	0.0	0.0	0.0	944.0	11.67	11.67	* UPPER PLENUM
050012	0.0	81.60	1.4000	-4.80	0.0	191.0	3.59	3.59	*UP PLENUM
050021	0	0	0.0	0.0	0.0	191.0	3.59	3.59	* HOT LEG
050022	0.0	9.18	2.4167	-1.21	0.0	268.7	5.91	5.91	*HOT LEG SG 2
050031	0	0	0.0	0.0	0.0	268.7	5.91	5.91	* SG PLENUM
050032	5.473	75.24	5.9400	0.79	0.0	224.8	10.54	10.54	*SGPLENUM HOT
050041	0	0	0.0	0.0	0.0	224.8	10.54	10.54	* SG LW TUBE H
050042	0.0	21.34	0.0646	6.70	0.0	224.8	10.54	10.54	*LW TUBE HOT2
050051	0	0	0.0	0.0	0.0	224.8	10.54	10.54	* SG MDTUBE
050052	0.0	21.34	0.0646	17.24	0.0	449.6	9.405	9.405	*MID TUBE HOT
050071	5	0	0.0	0.0	0.0	449.6	9.405	9.405	*SG U TUBE CO
050072	0.0	21.34	0.0646	27.7154	0.0	224.8	10.54	10.54	*U TUBE COLD2
050081	0	0	0.0	0.0	0.0	224.8	10.54	10.54	* SG MD TUBE C
050082	0.0	21.34	0.0646	17.24	0.0	224.8	10.54	10.54	*MID TUBECOLD
050091	0	0	0.0	0.0	0.0	224.8	10.54	10.54	* SG U TUBE C
050092	0.0	21.34	0.0646	6.70	0.0	268.7	5.91	5.91	*LW TUBE COLD
050101	0	0	0.0	0.0	0.0	268.7	5.91	5.91	* SG PLENUM CO
050102	5.473	75.24	5.9400	0.79	0.0	261.2	12.05	12.05	*PLENUM COLD2
050111	0	0	0.0	0.0	0.0	261.2	12.05	12.05	* PUMP SUCTION
050112	0.0	10.48	2.5833	-9.83	0.0	384.0	5.19	5.19	*PUMP SUCTION
050121	0	0	0.0	0.0	0.0	384.0	5.19	5.19	* RCP 2
050122	0.0	19.20	3.5000	-4.04	0.0	161.6	2.29	2.29	*RCP 2
050131	0	0	0.0	0.0	0.0	161.6	2.29	2.29	* COLD LEG 2
050132	18.78	8.24	2.2917	-1.15	0.0	184.0	8.63	8.63	*COLD LEG 2
050141	0	0	0.0	0.0	0.0	184.0	8.63	8.63	* UP DNCMR 2

*90X2 TORKF1 TORKF2 TORKF3 TORKF4

090012 1202.
090022 2404.

*
**** PUMP CURVE INDICATOR

*
*100000 FLAGJ NCURVEJ
100000 0 8

***** PUMP HEAD DATA - HOMOLOGOUS CURVES - *****

101011 4 0.0 1.75 0.6 1.25 0.8 1.25 1.0 1.0 *HEAD CURVE 1
101021 4 0.0 -1.55 0.6 -0.15 0.7 0.10 1.0 1.0 *HEAD CURVE 2
101031 2 -1.0 4.24 0.0 1.75 *HEAD CURVE 3
101041 2 -1.0 4.25 0.0 1.65 *HEAD CURVE 4
101091 2 0.0 0.95 1.0 1.0 *TORQUE CURVE 9
101101 2 0.0 -1.50 1.0 1.0 *TORQUE CURVE 10
101111 2 -1.0 3.05 0.0 0.95 *TORQUE CURVE 11
101121 2 -1.0 3.05 0.0 1.45

*VALVE DATA

*11XXXO ITCV IACV IACV2 PCV CV1 CV2 CV3
110010 -15 1 2 0.0 .0 0.0 0.0
*12XXYY NAREA TAREA1 TAREA2 TAERA1 TAREA2 *
120101 -4 0.00 0.00 0.001 0.00 *BREAK OPENS
120102 0.002 1.00 9.000 1.00 *BREAK OPENS
120201 -4 0.00 1.00 0.001 1.00 *BREAK CLOSES
120202 0.002 0.00 9.000 0.00 *BREAK CLOSES
120301 -2 0.00 0.00 30.6 -476.01 *DUMP 1 FNG AREA
120401 -2 0.00 0.00 30.6 -476.01 *DUMP 2 FNG AREA
*13XXYY NFILL ITFILL JX JY FILTLB1 FILTLB2 FILENT1 FILPRS1 *
130101 -2 3 0 0 0.0 935.19 417.93 825.4 *FW 1
130102 50.0 935.19 417.93 825.4 *
130201 -2 4 0 0 0.0 -935.19 1198.4 774.2 *ST 1
130202 50.0 -935.19 1198.4 774.2 *
130301 -2 9 0 0 0.0 935.19 417.93 825.4 *FW 2
130302 50.0 935.19 417.93 825.4 *
130401 -2 10 0 0 0.0 -935.19 1198.4 774.2 *ST 2
130402 50.0 -935.19 1198.4 774.2 *
130501 -2 19 0 0 0.0 41.75 51.5 1300.0 *AUXFW 1
130502 50.0 41.75 51.5 1300.0 *
130601 -2 20 0 0 0.0 41.75 51.5 1300.0 *AUXFW 2
130602 50.0 41.75 51.5 1300.0 *
130701 -7 2 39 0 15.0 48.50 52.0 1500.0 *SI
130702 615.0 37.00 52.0 1500.0 *SI
130703 1015.0 26.67 52.0 1500.0 *SI
130704 1265.0 18.33 52.0 1500.0 *SI
130705 1415.0 6.67 52.0 1500.0 *SI
130706 1470.0 0.0 52.0 1500.0 *SI
130707 1800.0 0.0 52.0 1500.0 *SI
130801 -2 5 132 0 1100.0 -183.65 1.0 1.0 *SAF1 STM1
130802 1125.0 -188.80 1.0 1.0 *SAF1 STM1
130901 -2 6 132 0 1100.0 -183.65 1.0 1.0 *SAF2 STM1

130902 1125.0 -188.80 1.0 1.0 *SAF2 STM1
131001 -2 7 132 0 1140.0 -278.27 1.0 1.0 *SAF3 STM1
131002 1155.0 -281.93 1.0 1.0 *SAF3 STM1
131101 -2 8 132 0 1140.0 -278.27 1.0 1.0 *SAF4 STM1
131102 1155.0 -281.93 1.0 1.0 *SAF4 STM1
131201 -2 11 232 0 1100.0 -183.65 1.0 1.0 *SAF1 STM2
131202 1125.0 -188.80 1.0 1.0 *SAF1 STM2
131301 -2 12 232 0 1100.0 -183.65 1.0 1.0 *SAF2 STM2
131302 1125.0 -188.80 1.0 1.0 *SAF2 STM2
131401 -2 13 232 0 1140.0 -278.27 1.0 1.0 *SAF3 STM2
131402 1155.0 -281.93 1.0 1.0 *SAF3 STM2
131501 -2 14 232 0 1140.0 -278.27 1.0 1.0 *SAF4 STM2
131502 1155.0 -281.93 1.0 1.0 *SAF4 STM2
131601 -2 2 0 0 0.0 24.00 55.0 2725.0 *CHARGING
131602 50.0 24.00 55.0 2725.0 *
131701 -1 1000 -13 0 1.0 -476.01 1.0 1.0 *STM DMP 1
131801 -1 1000 -14 0 1.0 -476.01 1.0 1.0 *STM DMP 2
131901 -2 19 0 0 0.0 -3.703 1100.0 1000.0 *AUX PUMP
131902 50.0 -3.703 1100.0 1000.0 *STEAM 1
132001 -2 20 0 0 0.0 -3.703 1100.0 1000.0 *AUX PUMP
132002 50.0 -3.703 1100.0 1000.0 *STEAM 2

*
* HEAT CONDUCTOR DATA
*

*15XXX1 VSL VSR GOM ELEV MCL MCR ASUL ASUR VOLSL
150011 0 18 1 000.00 10 10 0.0 14220.8 125.60 *LW CORE
150021 0 19 1 0.00 10 10 0.0 14220.8 125.60 *MID CORE
150031 0 20 1 0.00 10 10 0.0 14220.8 125.60 *UP CORE
150041 4 201 2 4.35 2 2 11498.6 12964.0 51.12 *LW HOT SG 2
150051 5 201 2 13.98 2 2 13955.8 15734.0 62.08 *MID HOT SG 2
150061 7 201 2 23.92 2 2 13954.0 15732.0 61.60 *U HOT SG 2
150091 9 201 2 4.35 2 2 11498.6 12964.0 51.12 *LW COLD SG 2
150081 8 201 2 13.98 2 2 13955.8 15734.0 62.08 *MID COLD SG 2
150071 7 201 2 23.92 2 2 13954.0 15732.0 61.60 *U COLD SG 2
150101 25 101 2 4.35 2 2 5749.3 6482.0 25.56 *LW HOT SG 1
150111 26 101 2 13.98 2 2 6977.9 7867.0 31.04 *MID HOT SG 1
150121 28 101 2 23.92 2 2 6977.0 7866.0 30.80 *U HOT SG 1
150151 30 101 2 4.35 2 2 5749.3 6482.0 25.56 *LW COLD SG 1
150141 29 101 2 13.98 2 2 6977.9 7867.0 31.04 *MID COLD SG 1
150131 28 101 2 23.92 2 2 6977.0 7866.0 30.80 *U COLD SG 1
150161 0 2 5 0.00 2 2 0.0 296.0 67.00 *HT LEG 2
150261 0 23 5 0.00 2 2 0.0 148.0 33.50 *HT LEG 1
150171 0 3 6 0.00 2 2 0.0 2736.6 206.00 *SG 2 PLM
150181 0 10 6 0.00 2 2 0.0 2736.6 206.00 *SG 2 PLM
150271 0 24 6 0.00 2 2 0.0 1368.3 103.0 *SG 1 PLM
150281 0 31 6 0.00 2 2 0.0 1368.3 103.0 *SG 1 PLM
150191 0 11 8 0.00 2 2 0.0 438.0 104.00 *PUMP SUC
150291 0 32 8 0.00 2 2 0.0 219.0 52.00 *PUMP SUC
150201 0 12 8 0.00 2 2 0.0 353.4 504.6 *PUMP 2
150301 0 33 8 0.00 2 2 0.00 176.7 252.3 *PUMP 1
150211 0 13 9 0.00 2 2 0.0 256.0 55.20 *C LEG 2
150311 0 34 9 0.00 2 2 0.0 128.0 27.60 *C LEG 1
150221 0 14 3 0.00 2 2 0.0 242.4 200.00 *RX PLM 2
150231 0 15 3 0.00 2 2 0.0 242.4 200.00 *RX PLM 2
150241 0 16 3 0.00 2 2 0.0 242.4 200.00 *RX PLM 2
150321 0 35 3 0.00 2 2 0.0 121.2 100.00 *RX PLM 1
150331 0 36 3 0.00 2 2 0.0 121.2 100.00 *RX PLM 1
150341 0 37 3 0.00 2 2 0.0 121.2 100.00 *RX PLM 1
150251 0 17 7 0.00 2 2 0.0 277.7 121.94 *LOW PLM

150351 0 22 4 0.00 2 2 0.0 243.2 272.20 *UPPER HEAD
 *15XXX2 HDML HDMR DHDL DHER CHNL CHNR IHXQF *
 150012 0.0 0.0 0.0 0.0466 0.0 4.0 0 *
 150022 0.0 0.0 0.0 0.0466 0.0 4.0 0 *
 150032 0.0 0.0 0.0 0.0466 0.0 4.0 0 *
 150042 0.0 .11185 0.0 0.11185 8.71 8.71 2 *
 150052 0.0 .11185 0.0 0.11185 10.54 10.54 2 *
 150062 0.0 .11185 0.0 0.11185 9.34 9.34 2 *
 150092 0.0 .11185 0.0 0.11185 8.71 8.71 2 *
 150082 0.0 .11185 0.0 0.11185 10.54 10.54 2 *
 150072 0.0 .11185 0.0 0.11185 9.34 9.34 2 *
 150102 0.0 .11185 0.0 0.11185 8.71 8.71 1 *
 150112 0.0 .11185 0.0 0.11185 10.54 10.54 1 *
 150122 0.0 .11185 0.0 0.11185 9.34 9.34 1 *
 150152 0.0 .11185 0.0 0.11185 8.71 8.71 1 *
 150142 0.0 .11185 0.0 0.11185 10.54 10.54 1 *
 150132 0.0 .11185 0.0 0.11185 9.34 9.34 1 *
 150162 0.0 2.42 0.0 2.42 0.00 20.80 0 *
 150262 0.0 2.42 0.0 2.42 0.00 20.80 0 *
 150172 0.0 6.00 0.0 6.00 .00 0.00 0 *
 150182 0.0 6.00 0.0 6.00 .00 0.00 0 *
 150272 0.0 6.00 0.0 6.00 0.00 0.00 0 *
 150282 0.0 6.00 0.0 6.00 0.00 0.00 0 *
 150192 0.0 2.58 0.0 2.58 0.00 0.00 0 *
 150292 0.0 2.58 0.0 2.58 0.00 0.00 0 *
 150202 0.0 3.50 0.0 3.50 0.00 0.00 0 *
 150302 0.0 3.5 0.0 3.50 0.00 0.00 0 *
 150212 0.0 2.29 0.0 2.29 0.00 19.80 0 *
 150312 0.0 2.29 0.0 2.29 0.00 19.80 0 *
 150222 0.0 0.00 0.0 1.47 0.00 0.00 0 *
 150232 0.0 0.00 0.0 1.47 0.00 .00 0 *
 150242 0.0 0.00 0.0 1.47 0.00 0.00 0 *
 150322 0.0 0.00 0.0 1.47 0.00 0.00 0 *
 150332 0.0 0.00 0.0 1.47 0.00 .00 0 *
 150342 0.00 0.00 0.0 1.47 0.00 0.00 0 *
 150252 0.00 0.68 0.0 0.00 0.00 0.00 0 *
 150352 0.00 0.00 0.0 0.00 0.00 0.00 0 *

* CORE SECTION DATA

*16XXX0 ISLB CLTI QFRAC QFRACR IRGF IRGL
 *
 160010 1 0.0 0.33454
 160020 2 0.0 0.35695
 160030 3 0.0 0.30851

* CONDUCTOR GEOMETRY DATA

*17XXYY IG NR GAP IM SP RADDIST REGWIDTH PFRAC
 170101 2 3 1 6 0.0 0.01485 1.0 *UO-2 PELLET
 170102 0 3 2 3.125E-4 0.0 *GAP (HELIUM)
 170103 0 2 4 2.5000E-3 0.0 *CLADDING (ZR-4)
 170201 2 1 4 3 0.0323 4.1667E-3 0.0 *S-G TUBES
 170301 1 1 6 3 0.0 .822 0.0 *DOWNCOMMER RX
 170401 1 1 6 3 0.0 1.126 0.0 *UPPER HEAD
 170501 1 1 5 3 0.0 .2083 0.0 *HOT LEG
 170601 1 1 6 3 0.0 .0753 0.0 *SG PLM
 170701 1 1 6 3 0.0 .4322 0.0 *LOWER HEAD
 170801 1 1 5 3 0.0 .794 0.0 *PUMP LINE
 170901 1 1 5 3 0.0 .2152 0.0 *COLD LEG

*18XXYY THERMAL CONDUCTIVITY DATA
 *
 * THERM COND UO2 REF GEMP-482 FIG-13 86 W/CM
 180101 -11 *THERM COND UO2
 180102 212. 4.28 392. 3.47 752. 2.66 1112. 2.20 * THERM COND UO2
 180103 1472. 1.88 1832. 1.62 2192. 1.44 2912. 1.21 * THERM COND UO2
 180104 3632. 1.16 5072. 1.16 5500. 1.16 * THERM COND UO2
 *
 * THERMAL COND ZR-4 REF BRASSFIELD%1968<GEMP-482 RECOM... LWR LOCA
 180201 -8 0. 8. 1490. 12.32 2150. 17.5 *THERM COND ZR-4 1
 180202 2372. 19.7 2552. 21.8 2732. 24.0 3292. 28.9 *THERM COND ZR-4 2
 180203 3360. 33.1 *THERM COND ZR-4 3
 *
 * THERMAL COND HELIUM REF THETA1-B EQN
 180301 -6 *THERM COND HELIUM1
 180302 100. .0937 1100. .163 2100. .212 3100. .253 *THERM COND HELIUM2
 180303 4100. .289 5100. .322 *THERM COND HELIUM3
 *
 * THERMAL COND INCONEL 600 REF NUC. SYSTEMS MATLS HANDBOOK TID-26666
 180401 -8 100. 8.5 300. 9.5 400. 10.0 *TH. COND INCONEL
 180402 500. 10.5 600. 11.0 700. 11.5 *TH. COND INCONEL
 180403 900. 12.6 1100. 13.8 *TH. COND INCONEL
 * THERMAL CONDUCTIVITY FOR STAINLESS STEEL ** EI DATA
 180501 -3 0.0 9.0 200.0 9.0 1600.0 15.0
 * THERMAL CONDUCTIVITY FOR CARBON STEEL ** CE DATA
 180601 -2 70.0 31.5 1000.0 22.4
 *
 *19XXYY VOLUMETRIC HEAT CAPACITY DATA
 *
 * SPEC HEAT UO2 REF BRASSFIELD%1968<GEMP-482 RECOM...LWR LOCA
 * SPEC HEAT UO2 95 PCT TH DEN AT 1000F 642 LB/FT3
 * SPEC HEAT UO2 REF BRASSFIELD%1968<GEMP-482 TOULOUKIAN SAME TO 3750 F
 190101 -19 *VOL HT CAP UO2 1
 190102 77. 36.22 100. 37.12 200. 40.05 *VOL HT CAP UO2 2
 190103 300. 41.98 400. 43.88 600. 45.18 *VOL HT CAP UO2 3
 190104 800. 46.41 1000. 47.32 *VOL HT CAP UO2 4
 190105 2400. 50.77 *VOL HT CAP UO2 5
 190106 2600. 51.43 2800. 52.61 3000. 54.57 *VOL HT CAP UO2 6
 190107 3200. 57.42 3400. 61.23 3600. 65.93 *VOL HT CAP UO2 7
 190108 4600. 95.15 4800. 99.31 5000. 101.57 *VOL HT CAP UO2 8
 190109 5074. 101.76 *VOL HT CAP UO2 9
 *
 * SPEC HEAT ZR-2 REF BMI-1803 ELDRIDGE ET AL (1967) DEN 409.55
 190201 15 *VOL HT CAP ZR-2 1
 190202 32. 28.75 932. 32.56 1112. 34.40 *VOL HT CAP ZR-2 2
 190203 1184. 35.22 1490. 35.22 1508. 49.14 *VOL HT CAP ZR-2 3
 190204 1544. 57.74 1580. 60.20 1616. 70.43 *VOL HT CAP ZR-2 4
 190205 1652. 79.85 1688. 75.35 1724. 59.38 *VOL HT CAP ZR-2 5
 190206 1760. 45.86 1787. 34.81 3300. 34.81 *VOL HT CAP ZR-2 6
 * SPEC HEAT HELIUM REF KREITH AT 1 ATM DEN 0.012 LB/FT3
 190301 -2 32. .519 3400. .519 *VOL HT CAP HELIUM1
 *
 * SPEC HEAT INCONEL 600 REF NUC. SYSTEMS MATLS HANDBOOK TID-26666
 190401 -8 100. 55.4 300. 58.8 400. 60.1 *VOL HT CAP INCONEL
 190402 500. 61.1 600. 62.1 700. 63.0 *VOL HT CAP INCONEL
 190403 900. 65.6 1100. 69.2 *VOL HT CAP INCONEL
 * HEAT CAPACITANCE FOR STAINLESS STEEL

```

190501 -2 200. 60. 2200. 80.
* HEAT CAPACITANCE FOR CARBON STEEL
190601 -2 0. 60. 2000. 80.
*
*2200YX ISHD LENS DZ TQCH NCON NCON NCON
220011 -1 3 0.0 0.0 4 5 6
220021 -1 3 0.0 0.0 9 8 7
220031 -1 3 0.0 0.0 10 11 12
220041 -1 3 0.0 0.0 15 14 13
*230000 STEADY-STATE INITIALIZATION CRITERIA
*
230000 25 0.0 0.0 0.0
*
*230XXY STEADY-STATE POWER REMOVAL SYSTEM DATA
* ISGNUM JBIAS JBAL POWF
230011 1 700 101 0.333333333
230021 2 800 201 0.666666667
*
*71000 NCI NCB DTCMAX
701000 13 26 .05
*****
*702XXX IDC CSYM IREG GAIN CIC
702001 1 TEMP 2 1.0 604.00 * THOT
702002 2 TEMP 13 1.0 547.00 * TCOLD
702003 3 WP** 94 1.0 0.00 * SI LOOP 2
702004 4 WP** 95 1.0 0.00 * SI LOOP 1
702005 5 TEMP 23 1.0 604.00 * THOT 1
702006 6 TEMP 34 1.0 547.00 * TCOLD 1
702007 7 TRIP 19 1.0 0.00 *
702008 8 TRIP 20 1.0 0.00 *
702009 9 CONS 0 547.2 547.20 * NO LOAD TAVE
*703XXX IDC ITYPE INC1 INC2 CGAIN CP1 CP1 CIC CMIN CMAX*
703001 -1 SUM 1 2 1.0 0.5 0.5 575.50 *TAVE
703002 -2 SUM 3 4 1.0 1.0 1.0 0.00 * SI FLOW
703003 -3 INT -2 0 1.0 0.0 0.0 0.00 * INT SI
703004 -4 SUM 5 6 1.0 0.5 0.5 575.50 *TAVE 1
703005 -5 LLG -4 0 1.0 25.0 5.0 0.00 *
703006 -6 LLG -1 0 1.0 25.0 5.0 0.00 *
703007 -7 SUM -5 9 1.0 1.0 -1.0 28.50 *
703008 -8 SUM -6 9 1.0 1.0 -1.0 28.50 *
703009 -9 LAG 7 0 1.0 0.5 0.0 0.00 0.0 1.0
703010 -10 LAG 8 0 1.0 0.5 0.0 0.00 0.0 1.0
703011 -11 MUL -9 -7 1.0 0.0 0.0 0.00 *
703012 -12 MUL -10 -8 1.0 0.0 0.0 0.00 *
703013 -13 FNG -11 3 1.0 0.0 0.0 0.00 -476.01 0.0
703014 -14 FNG -12 4 1.0 0.0 0.0 0.00 -476.01 0.0
*
* ROB3 ACCUMULATOR ADDITIONS
*
*10001 LDMP NEDI NTC NTRP NVOL NBUB NTDV NJUN NPMP NCKV NLK NLL NSLB NGOM
010001 -1 +51 1 45 50 8 3 75 2 3 6 22 35 9
*
*
* ACCUMULATOR TRIP LOGIC
*
040350 21 -4 13 0 614.70 0.0 * OPEN DBL. ACCUM.
040360 -21 -6 500 0 0.25 0.0 * CLOSE DBL. ACCUM.

```

```

040370 -21 -9 500 0 -0.001 0.0 * RESET ON REVERSE FLOW
*
040380 22 -4 34 0 614.70 0.0 * OPEN DBL. ACCUM.
040390 -22 -6 501 0 0.25 0.0 * CLOSE DBL. ACCUM.
040400 -22 -9 501 0 -0.001 0.0 * RESET ON REVERSE FLOW
040410 23 1 0 0 5000.0 0.0 * VESSEL CRACK 1
040420 24 1 0 0 5000.0 0.0 * VESSEL CRACK 2
*
* VOLUME DATA
*
*5XXX1 IBUB IREAD PRESS TEMP QUALITY VOLUME ZVOL ZM *
*5XXX2 FLOWL FLOWA DIAMV ELEV INEQ VRAIN VLHTC IPVBU BUB MESH *
055001 6 0 614.7 80.0 1.0 2513.8 17.34 12.39 * DLB LOOP ACC
055002 17.34 145.00 9.61 -.078
055011 7 0 614.7 80.0 1.0 1256.9 17.34 12.39 * SNG LOOP ACC
055012 17.34 72.49 9.61 -.078
*
*
* BUBBLE RISE INPUT
*
*6XXX1 ALPHA VBUB ICBG ICBV
060061 0.8 10.0
060071 0.8 10.0
060081 0.8 5.0
*
* JUNCTION DATA
*
*8XXX1 FM TO PMP VLV FLOWRATE AJUN ZJUN INERTIA *
085001 500 13 0 2 0.0 .836 -.078 100.0 * DBL ACCUM JUN
085011 501 34 0 3 0.0 .418 -.078 200.0 * SNG ACCUM JUN
086001 0 15 21 0 0.0 1.00 -7.0 1.0 * DBL ACCUM JUN
086011 0 36 22 0 0.0 1.00 -7.0 1.0 * SNG ACCUM JUN
*
*8XXX2 FJUNF FJUNR JV JC CL MV DIAMJ CON IFRJ JTPM ANG IHQ ISP *
085002 7.38 1.0E20 1 -1 0 3 .729 1.0 0 0 0.0 0
085012 7.38 1.0E20 1 -1 0 3 .729 1.0 0 0 0.0 0
086002 1.0 1.0 0 -1 0 0 1.0 1.0 0 0 0.0 0
086012 1.0 1.0 0 -1 0 0 1.0 1.0 0 0 0.0 0
*
* ACCUMULATOR VALVES
*
110020 -21 5 0 0.0 0.0 0.0 0.0 * DBL. ACCUM. VALVE
110030 -22 6 0 0.0 0.0 0.0 0.0 * SNG. ACCUM. VALVE
*
*
* ACCUM. VALVE GEN. DATA TABLE
*
120501 -3 0.0 0.0 0.1 1.0 1.E6 1.0 * OPEN DBL. ACCUM
120601 -3 0.0 0.0 0.1 1.0 1.E6 1.0 * OPEN SNG. ACCUM
*
132101 -2 23 1 0 0.0 0.0 500.0 500.0
132102 2000.0 10.0 500.0 500.0
132201 -2 24 1 0 0.0 0.0 500.0 500.0
132202 2000.0 10.0 500.0 500.0
*
*

```

```

*
040500 30 14 -25 0 0.0 0.0 *REACT DELT
040510 30 14 -26 0 0.0 0.0 *REACT DELT
040530 30 12 16 0 0 0.0 *REACT DELT
702010 10 PRES 39 1.0 2250.0 *PRESSURIZER PRES
702011 11 CONS 0 2250.0 2250.0 *PRESSURIZER PRES
702012 12 CONS 0 1.162 1.162
702013 13 CONS 0 575.46 575.46
703015 -15 SUM 1 2 1.0 1.0 -1.0 57.5 *DELT2
703016 -16 SUM 5 6 1.0 1.0 -1.0 57.5 *DELT1
703017 -17 SUM 10 11 7.978E-4 1.0 -1.0 0.0 *PRZER
703018 -18 SUM -1 13 1.0 1.0 -1.0 0.0 *AVT REACT -575F
703019 -19 SUM -4 13 1.0 1.0 -1.0 0.0 *AVT REACT -575F
703021 -21 LLG -18 0 0.01035 0.207 3.0 0.0
703022 -22 LLG -19 0 0.01035 0.207 3.0 0.0
703020 -20 SUM 12 -17 1.0 1.0 1.0 1.162
703023 -23 SUM -20 -21 57.5 1.0 -1.0 66.8 *DELT SET
703024 -24 SUM -20 -22 57.5 1.0 -1.0 66.8 *DELT SET
703025 -25 SUM -15 -23 1.0 1.0 -1.0 -9.3
703026 -26 SUM -16 -24 1.0 1.0 -1.0 -9.3

```

**** POWER TABLE

```

141101 9 30 0.0 1.0 0.2 0.973
141102 0.6 0.53 0.8 0.29
141103 1.16 0.1 2.2 0.06
141104 4.3 0.05 7.7 0.035
141105 800.0 0.02

```

* STEAMLINES

* REPLACEMENT TO REMOVE FLOW BC

```

*8XXX1 FM TO PMP VLV FLOWRATE AJUN ZJUN INERTIA *
081321 0 132 2 0 0.0 1.00 22.77 23.1500 * MSIV 1
082321 0 232 4 0 0.0 2.00 22.77 10.840 * MSIV 2
*8XXX29 FJUNF FJUNR JV JC CL MV DIAMJ CON IFRJ JTPM ANG IHQ ISP *
081322 1.0 1.0 0 -1 0 0 1.1284 0.0 0 0 0.0 0 *
082322 1.0 1.0 0 -1 0 0 1.1284 0.0 0 0 0.0 0 *
*13XXYY NFILL ITFILL JX JY FILTLB1 FILTLB2 FILENT1 FILPRS1 *
130201 -2 10 0 0 0.0 0.0 1198.4 774.2 *ST 1
130202 1000.0 0.0 1198.4 774.2 *
130401 -2 10 0 0 0.0 0.0 1198.4 774.2 *ST 2
130402 1000.0 0.0 1198.4 774.2 *

```

* ADDITION TO INSTALL PRESSURE BC

* VOLUME DATA

```

*5XXX1 IBUB IREAD PRESS ENTHY QUALITY VOLUME ZVOL ZM *
059011 0 2 790.0 0.0 0.0 1.014 13.63 13.63 *STEAMLIN
059021 0 3 790.0 0.0 0.0 2.028 13.63 13.63 *STEAMLIN
*5XXX2 FLOWL FLOWA DIAMV ELEV INEQ VRAIN VLHTC IPVUB MESH *
059012 0.0 3.09 1.985 22.77 *STEAMLIN
059022 0.0 6.18 1.985 22.77 *STEAMLIN

```

*TIME DEPENDENT VOLUME

```

* IRIN TIME P TEMP C M LEVEL
070201 2 0.0 790.0 518.22 0.0 13.63
070202 9999.0 790.0 518.22 0.0 13.63
070301 2 0.0 790.0 518.22 0.0 13.63
070302 9999.0 790.0 518.22 0.0 13.63

```

* JUNCTION DATA

```

*8XXX1 FM TO PMP VLV FLOWRATE AJUN ZJUN INERTIA *
089011 132 901 0 0 935.19 3.09 22.77 0.0 *
089021 232 902 0 0 1870.38 6.18 22.77 0.0 *
*8XXX2 FJUNF FJUNR JV JC CL MV DIAMJ CON IFRJ JTPM ANG IHQ ISP *
089012 -1.0 -1.0 0 -1 2 0 1.985 0.0 0 0 0.0 0 *
089022 -1.0 -1.0 0 -1 2 0 1.985 0.0 0 0 0.0 0 *

```

Figure 7-5
Sample Problem
MINET Input Deck

MINET DECK, DEVELOPED FOR RETRAN/MINET CODE WORKSHOP

OV MINETD /**** MAIN FEEDWATER FLOW PATH ****/

1D 1,1,2,0.5,0.443,1.5E-5,1,1/
 1D 2,1,2,10.8,0.443,1.5E-5,1,1/
 1D 3,1,2,22.15,0.443,1.5E-5,2,1/
 1D 4,1,2,50.529,0.353,1.5E-5,3,2/
 1D 5,1,2,50.529,0.353,1.5E-5,3,1/
 201D 201,1,2,3.186,0.353,1.5E-6,1,2/
 301D 301,1,2,12.67,0.0144,4.5E-6,1,1,3,4,1.5875E-2,
 2.0137,2100,1,6,0.0,1.,0.0,1,1,0.941E3,0.184E5/
 401D 401,1/
 402D 402,1/
 401D 403,1/
 402D 404,1/
 402D 406,1/
 501D 101,2,35.34,3.0,0.0,1.0,3.186,1,1/
 511D 101,1/
 512D 101,2/
 512D 101,3/
 801D 401,1/
 801D 403,1/
 901D 0.0,401,1,1,1/
 901D 0.0,1,2,201,1/
 901D 3.186,201,2,2,1/
 901D 3.186,2,2,301,1/
 901D 3.186,301,2,3,1/
 901D 3.186,3,2,101,1/
 901D 3.186,101,2,5,1/
 901D 0.0,5,2,402,1/
 901D 3.186,101,3,4,1/
 901D 0.0,4,2,404,1/
 901D 3.686,403,1,301,3/
 901D 2.686,301,4,406,1/
 1001D 2,9.37/
 1001D 3,10.31/
 1001D 4,10.31/
 1001D 5,10.31/
 1201D 201,0.0,704.0565,507.492,3570.0,1.2772,-0.6397,
 1.2513,-1.1053,0.2167,5.0,20.0/
 1301D 301,0.5,0.5,3,3,-1.0/
 2201D 201,0.0,3570.0/
 2301D 301,207.2E6/
 2401D 401,0,1,0.808474E6,1272.61,1000.0/
 2401D 403,0,1,2.74E6,181.93,4.2E6/
 2401D 402,1,1,9.7126E5,424.202,5.7725E6/
 2401D 404,1,1,9.7126E5,828.404,5.7725E6/
 2401D 406,1,1,1.60E6,181.93,4.2E6/
 2501D 101,0.0,0.0,7.112E6/
 2511D 101,2,424.202/
 2511D,101,3,848.404/
 3201D 201,9999.9/
 3221D 201,0.0,3570.0,999.0,3570.0/
 3411D 401,1,1,0.0,0.80847E6,1272.61,9999.0,0.80847E6,1272.61/
 3411D 403,1,1,0.0,2.74E6,181.93,9999.0,2.74E6,181.93/
 3411D 406,2,1,0.0,1.6E6,4.2E6,9999.0,1.6E6,4.2E6/
 3411D 402,2,1,0.0,9.7126E5,5.7725E6,999.0,9.7126E5,5.7725E6/
 3411D 404,2,1,0.0,9.7126E5,5.7725E6,999.0,9.7126E5,5.7725E6/
 /**** MAIN STEAM LINE FLOW PATH ****/
 1D 21 1,2,0.1,0.605,1.5E-5,1,1/
 1D 22,1,2,27.627,0.68,1.5E-5,3,3/

1D 23,1,2,0.1,0.605,1.5E-5,1,2/
 101D 501,1,2,1.2,0.605,1.5E-4,1,1,0.287,1.0E-5,1.5/
 101D 502,1,2,1.2,0.605,1.5E-4,1,1,0.287,1.0E-5,1.5/
 401D 411,1/
 401D 413,1/
 402D 412,1/
 402D 414,1/
 402D 416,1/
 501D 111,2,35.34,3.0,0.0,1.0,19.79,1,1/
 501D 112,2,35.34,3.0,0.0,1.0,19.79,1,1/
 511D 111,1/
 512D 111,2/
 511D 111,3/
 512D 111,4/
 511D 112,1/
 512D 112,2/
 512D 112,3/
 601D 601,1,2,15.0/
 801D 411,1/
 801D 413,1/
 901D 18.29,411,1,21,1/
 901D 19.29,21,2,111,1/
 901D 19.79,111,2,22,1/
 901D 19.79,22,2,112,1/
 901D 19.79,112,2,601,1/
 901D 19.79,601,2,412,1/
 901D 18.29,413,1,23,1/
 901D 19.29,23,2,111,3/
 901D 19.29,112,3,502,1/
 901D 19.29,502,2,414,1/
 901D 20.29,111,4,501,1/
 901D 21.79,501,2,416,1/
 1101D 501,1.0E4,1.0,1,-999,6.0E6,10.0,0.1E6,15.0/
 1101D 502,1.0E4,1.0,1,-999,6.0E6,10.0,0.1E6,15.0/
 1601D 601,1,0.95,1272.61,5.2E6,3.892E6,544.5,1800.0,8.0,20.0/
 2101D 501,0.0,1.0E-5/
 2101D 502,0.0,1.0E-5/
 2401D 411,0,1,2.7872E6,424.202,5.447E6/
 2401D 413,0,1,2.7872E6,848.404,5.447E6/
 2401D 412,1,1,1.89E6,1272.61,3.892E6/
 2401D 414,1,3,0.9975,0.001,4.892E6/
 2401D 416,1,3,0.99075,0.001,5.0E6/
 2501D 111,0.0,0.0,5.44E6/
 2501D,112,0.0,0.0,5.21E6/
 2511D 111,2,1272.61/
 2511D 111,4,0.001/
 2511D,112,3,1272.61/
 2511D 112,2,0.001/
 2601D 601,1800.0,-113.0E7/
 3011D 22, 0.0,0.0,999.0,0.0/
 3121D 501, 0.0,1.0E-5, 999.0,1.0E-5/
 3121D 502, 0.0,1.0E-5, 999.0,1.0E-5/
 3411D 411,1,1, 0.0,2.7872E6,424.202, 999.0,2.7872E6,424.202/
 3411D 413,1,1, 0.0,2.7872E6,848.404, 999.0,2.7872E6,848.404/
 3411D 412,2,1, 0.0,1.89E6,3.892E6, 999.0,1.89E6,3.892E6/
 3411D 414,2,3, 0.0,0.9975,4.892E6, 999.0,0.9975,4.892E6/
 3411D 416,2,3, 0.0,0.99075,5.0E6, 999.0,0.99075,5.0E6/
 3601D 601,999.0/
 3611D 601, 0.0,1800.0, 999.0,1800.0/
 4000D 25.0/

4100D 99999,3,1.0,999.0/

4200D 0,50/

4300D 1/

/

OV LINK

10000D	1	1	902	413	0	0
--------	---	---	-----	-----	---	---

10000D	2	2	0	0	800	404
--------	---	---	---	---	-----	-----

10000D	3	1	901	411	0	0
--------	---	---	-----	-----	---	---

10000D	4	2	0	0	700	402
--------	---	---	---	---	-----	-----

STOP

END

Figure 7-6
Print-out from
RETRAN/MINET
Sample Problem

```

Size of largest free area ... 5090744 bytes
Size of free area obtained ... 617593 (8 byte) words
Offset in A to beginning of free space ... 63963
Address a(1) ... 4804904
Address a(iaddr+1) ... 5316608
Address a(szz(1)) ... 10257344
size= 617394 0 10000 10000 10000 10000 10000
szz = 681556 0 10000 10000 10000 10000 10000 0
min = 64163 0 1 1 1 1 1
max = 681556 0 10001 10001 10001 10001 10001

```

LISTING OF INPUT DATA FOR CASE 1

```

1 = SAMPLE PROBLEM SB LOCA HOTLEG
2 *
3 *
4 * THIS IS A BEST ESTIMATE MODEL TO HANDLE A SMALL BREAK LOCA IN THE
5 * LOOP WITH THE PRESURIZER. THE BREAK SIZE IS THREE INCHES IN DIAMETER.
6 * THE FOLLOWING ASSUMPTIONS HAVE BEEN MADE TO MAKE THE RESULTS AS
7 * CONSERVATIVE AS PRACTICAL WHILE STILL MAINTAINING A BEST ESTIMATE
8 * MODEL.
9 * 1. THE HOT LEG IS THE BREAK LOCATION
10 * 2. TWO CHARGING PUMPS EACH PROVIDING MAXIMUM FLOW AT 40 DEGREES F
11 * 3. THREE SI PUMPS CURVE CONTROLLED PROVIDING 40 DEGREE F. FLOW
12 * 4. 400 GPM/SG AUX FEED FLOW AT 40 DEGREES F.
13 * 5. STEAM DUMP BASED ON NO-LOAD TAVE
14 * 6. ONE NODE SECONDARY IN THE STEAM GENERATOR
15 * 7. BEGINNING OF LIFE DECAY HEAT 0.001 ANS CURVES.
16 *
17 *10001 LDMP NEDI NTC NTRP NVOL NBUB NTDV NJUN NPMP NCKV NLK NFLL NSLB NGOM
18 010001 0 +11 2 34 46 5 1 69 2 1 4 20 35 9
19 *10002 NMAT NCOR NHTX NTMN NODEL MWREAC NLVC MTDV ISFLAG NCHT JSST IPRZR
20 010002 6 3 0 0 0 0 0 0 1 0 0 1
21 *10003 ITRNS IDNBC ICF IHTMAP ICSVL INCSCD INEXPL NSTK NTSN IVOID NFIT JFLAG
22 010003 0 0 1 1 0 0 -1 4 0 0 0 0
23 *10004 NEQS NSEPR
24 010004 0 0
25 *10005 POWER
26 010005 2300.0
27 **
28 *
29 010140 RETRAN1
30 *10141 "NDSCRI" "GE"
31 *
32 **
33 ***** MINOR EDITS
34 **
35 **
36 020000 COUT -25 TRIP 30 COUT -15 COUT -16 COUT -23 COUT -24
37 020001 WP** 1 PRES 39 WP** 13 WP** 100 WP** 43 WP** 34 WP** 190
38 020002 WP** 200 WP** 201 WP** 290 WP** 95 WP** 94
39 020003 WP** 92 PRES 101 PRES 201 TEMP 23 TEMP 34
40 020004 TEMP 2 TEMP 13 PNRM 0 AVED 23 WQ** 101
41 020005 WQ** 201 LIQL 101 LIQL 201 LIQL 39
42 020006 TEMP 14 TEMP 16 TEMP 35 TEMP 37
43 020007 WP** 75 TRIP 16 WP** 901 WP** 902 PRES 901 PRES 902
44 020008 PRES 23 HP** 200 HP** 100 HW** 101 HW** 201
45 020009 PRES 701 PRES 801 WP** 700 WP** 800
46 *
47 ** TIME STEPS
48 *
49 *
50 *3XXX0 NMIN NMAJ VPMP NCHK DELTM DTMIN TLAST EPSP EPSIMP EPST EPSCHG NSHAP
51 030010 1 1 10 0 0.001 0.0005 0.001
52 030010 1 1 1 0 1.0 0.001 50.0
53 *30*30 20 10 1 0 0.1 0.00001 2010.0 0.07 0.004
54 *
55 ** TRIP CONTROLS
56 *
57 *4XXX0 IDTRP IDSIG IX1 IX2 SETPT DELAY
58 040010 1 1 0 0 25.0 0.0 * END PROBLEM ON ELAPSE TIME

```

*** THIS CARD IS A REPLACEMENT CARD. ***

59	040020	2	-4	39	0	1730.	5.0	*	SI TRIP
60	040030	3	1	0	0	0.0	0.0	*	FEEDWATER 1 START
61	040040	4	1	0	0	0.0	0.0	*	STEAMFLOW 1 START
62	040050	5	4	132	0	1089.0	0.0	*	STEAM1SAFETY1 LO OPEN
63	040060	-5	-4	132	0	1045.0	0.0	*	STEAM1SAFETY1 RESET LG BLOW
64	040070	6	4	132	0	1114.0	0.0	*	STEAM1SAFETY2 OPEN
65	040080	-6	-4	132	0	1069.0	0.0	*	STEAM1SAFETY2 RESET
66	040090	7	4	132	0	1128.0	0.0	*	STEAM1SAFETY3 OPEN
67	040100	-7	-4	132	0	1083.0	0.0	*	STEAM1SAFETY3 RESET
68	040110	8	4	132	0	1143.0	0.0	*	STEAM1SAFETY4 OPEN
69	040120	-8	-4	132	0	1097.0	0.0	*	STEAM1SAFETY4 RESET
70	040130	9	1	0	0	0.0	0.0	*	FEEDWATER 2 START
71	040140	10	1	0	0	0.0	0.0	*	STEAMFLOW 2 START
72	040150	11	4	232	0	1089.0	0.0	*	SAFETY 1 STEAM 2
73	040160	-11	-4	232	0	1045.0	0.0	*	SAFETY 1 STEAM 2 CLOSE
74	040170	12	4	232	0	1114.0	0.0	*	SAFETY 2 STEAM 2
75	040180	-12	-4	232	0	1069.0	0.0	*	SAFETY 2 STEAM 2 CLOSE
76	040190	13	4	232	0	1128.0	0.0	*	SAFETY 3 STEAM 2
77	040200	-13	-4	232	0	1083.0	0.0	*	SAFETY 3 STEAM 2 CLOSE
78	040210	14	4	232	0	1143.0	0.0	*	SAFETY 4 STEAM 2
79	040220	-14	-4	232	0	1097.0	0.0	*	SAFETY 4 STEAM 2 CLOSE
80	040230	15	1	0	0	0.01	5.0	*	BREAK START
81	040240	16	-4	39	0	1859.0	1.0	*	SCRAM-RCP TRIP
82	040250	-3	12	16	0	0.0	2.0	*	FEEDWATER 1 STOP
83	040260	-4	12	16	0	0.0	2.0	*	STEAMFLOW 1 STOP
84	040270	-9	12	16	0	0.0	2.0	*	FEEDWATER 2 STOP
85	040280	-10	12	16	0	0.0	2.0	*	STEAMFLOW 2 STOP
86	040290	17	-5	101	0	33.93	0.0	*	AUXFEED 1 LOLVL START
87	040300	18	-5	201	0	33.93	0.0	*	AUXFEED 2 LOLVL START
88	040310	19	13	17	16	0.0	2.0	*	AUXFEED1LOLVL & SCRAM
89	040320	20	13	18	16	0.0	2.0	*	AUXFEED2LOLVL & SCRAM
90	040330	-19	6	101	0	41.08	0.0	*	AUXFEED 1 HILVL STOP
91	040340	-20	6	201	0	41.08	0.0	*	AUXFEED 2 HILVL STOP

* VOLUME DATA

	*5XXX1	IBUB	IREAD	PRESS	TEMP	QUALITY	VOLUME	ZVOL	ZM	*	
94	*5XXX2	FLOWL	FLOWA	DIAMV	ELEV	INEQ	VRAIN	VLHTC	IPVBUB	MESH	*
95	050011	0	0	0.0	0.0	0.0	944.0	11.67	11.67	* UPPER PLENUM	
96	050012	0.0	81.60	1.4000	-4.80	0.0	191.0	3.59	3.59	*UP PLENUM	
97	050021	0	0	0.0	0.0	0.0	268.7	5.91	5.91	* HOT LEG	
98	050022	0.0	9.18	2.4167	-1.21	0.0	224.8	10.54	10.54	*HOT LEG SG 2	
99	050031	0	0	0.0	0.0	0.0	224.8	10.54	10.54	* SG PLENUM	
100	050032	5.473	75.24	5.9400	0.79	0.0	224.8	10.54	10.54	*SGPLENUM HOT	
101	050041	0	0	0.0	0.0	0.0	224.8	10.54	10.54	* SG LW TUBE H	
102	050042	0.0	21.34	0.0646	6.70	0.0	224.8	10.54	10.54	*LW TUBE HOT2	
103	050051	0	0	0.0	0.0	0.0	224.8	9.34	9.34	* SG MIDTUBE	
104	050052	0.0	21.34	0.0646	17.24	0.0	224.8	9.34	9.34	*MID TUBE HOT	
105	*50061	0	0	0.0	0.0	0.0	224.8	9.34	9.34	* SG U TUBE HO	
106	*50062	0.0	21.34	0.0646	27.78	0.0	224.8	9.34	9.34	*U TUBE HOT 2	
107	*50071	0	0	0.0	0.0	0.0	224.8	9.34	9.34	* SG U TUBE CO	
108	*50072	0.0	21.34	0.0646	27.78	0.0	449.6	9.405	9.405	*U TUBE COLD2	
109	050071	5	0	0.0	0.0	0.0	224.8	10.54	10.54	*SG U TUBE CO	
110	050072	0.0	21.34	0.0646	27.7154	0.0	224.8	10.54	10.54	*U TUBE COLD2	
111	050081	0	0	0.0	0.0	0.0	224.8	10.54	10.54	* SG MD TUBE C	
112	050082	0.0	21.34	0.0646	17.24	0.0	224.8	10.54	10.54	*MID TUBECOLD	
113	050091	0	0	0.0	0.0	0.0	224.8	10.54	10.54	* SG LW TUBE C	
114	050092	0.0	21.34	0.0646	6.70	0.0	268.7	5.91	5.91	*LW TUBE COLD	
115	050101	0	0	0.0	0.0	0.0	261.2	12.05	12.05	* SG PLENUM CO	
116	050102	5.473	75.24	5.9400	0.79	0.0	261.2	12.05	12.05	*PLENUM COLD2	
117	050111	0	0	0.0	0.0	0.0	261.2	12.05	12.05	* PUMP SUCTION	

239	080251	25	26	0	0	9388.9	10.68	17.24	.9864	*					
240	*80261	26	27	0	0	9388.9	10.68	27.78	.9864	*					
241	080261	26	28	0	0	9388.9	10.68	27.748	1.480	*					
242	*80271	27	28	0	0	9388.9	10.68	37.10	0.9864	*					
243	*80281	28	29	0	0	9388.9	10.68	27.78	0.9864	*					
244	080281	28	29	0	0	9388.9	10.68	27.748	1.480	*					
245	080291	29	30	0	0	9388.9	10.68	17.24	0.9864	*					
246	080301	30	31	0	0	9388.9	10.68	6.70	0.5654	*					
247	080311	31	32	0	0	9388.9	5.24	1.61	2.4502	*					
248	080321	32	33	-1	0	9388.9	5.24	-4.04	3.4196	*					
249	080331	33	34	1	0	9388.9	4.12	0.00	3.3208	*					
250	080341	34	35	0	0	9388.9	4.12	0.00	2.8380	*					
251	080351	35	36	0	0	9372.0	7.72	-2.67	1.1180	*					
252	080361	36	37	0	0	9372.0	7.72	-11.30	1.1180	*					
253	080371	37	17	0	0	9372.0	7.72	-19.92	0.9120	*					
254	*80381	38	39	0	0	0.1	.000107	45.18	100.00	*					
255	080391	39	40	0	0	0.0	0.79	9.13	48.5520	*					
256	080401	40	23	0	0	0.0	0.60	0.00	50.0050	*					
257	*80411	34	38	0	0	0.0	.06447	1.14	100.00	*					
258	080421	17	21	0	0	985.8	2.742	-16.72	5.3130	*					
259	080431	1	23	0	0	9388.9	4.59	0.00	2.5020	*					
260	080441	35	22	0	0	16.9	.00625	5.96	261.55	*					
261	080451	14	22	0	0	33.8	.0125	5.96	130.78	*					
262	*80711	0	39	1	0	0.0	1.00	45.00	0.4772	* PRZ SAF 1					
263	*80721	0	39	2	0	0.0	1.00	45.00	0.4772	* PRZ SAF 2					
264	*80731	0	39	3	0	0.0	1.00	45.00	0.4772	* PRZ SAF 3					
265	*80741	0	39	4	0	0.0	1.0	45.0	0.4772	* PORV 1					
266	***** THIS IS THE BREAK *****														
267	*****														
268	080751	23	900	0	1	0.0	0.0491	0.00	4.2440	* H LEG BREAK					
269	080921	0	13	16	0	0.0	1.00	0.00	0.2770	* COLD CHARG					
270	080941	0	13	7	0	0.0	2.00	1.14	0.2300	* SI 2					
271	080951	0	34	7	0	0.0	1.00	1.14	0.4590	* SI 1					
272	081001	701	101	0	0	935.19	1.0534	8.53	0.3024	* SG1 INLET					
273	081011	101	131	0	0	935.19	4.35	62.06	8.1970	* SG1 OUTLET					
274	081311	131	132	0	0	935.19	1.396	36.40	31.0446	* FLO RESTR 1					
275	081321	0	132	2	0	-935.19	1.00	22.77	23.1500	* MSIV 1					
276	081351	0	132	17	0	0.0	1.00	22.77	23.1500	* STM DUMP 1					
277	081511	0	132	8	0	0.00	1.00	22.77	23.1500	* STM 1 SAF 1					
278	081521	0	132	9	0	0.00	1.00	22.77	23.1500	* STM 1 SAF 2					
279	081531	0	132	10	0	0.00	1.00	22.77	23.1500	* STM 1 SAF 3					
280	081541	0	132	11	0	0.00	1.00	22.77	23.1500	* STM 1 SAF 4					
281	081901	0	101	5	0	0.00	1.00	8.53	0.3024	* AUX FEED 1					
282	082001	801	201	0	0	1870.38	2.1068	8.53	0.1512	* SG2 INLET					
283	082011	201	231	0	0	1870.38	8.70	62.06	4.0985	* SG2 OUTLET					
284	082311	231	232	0	0	1870.38	2.792	36.40	17.6066	* FLO RESTR 2					
285	082321	0	232	4	0	-1870.38	2.00	22.77	10.840	* MSIV 2					
286	082351	0	232	18	0	0.00	2.00	22.77	10.840	* STM DUMP 2					
287	082511	0	232	12	0	0.00	2.00	22.77	10.840	* STM 2 SAF 1					
288	082521	0	232	13	0	0.00	2.00	22.77	10.840	* STM 2 SAF 2					
289	082531	0	232	14	0	0.00	2.00	22.77	10.840	* STM 2 SAF 3					
290	082541	0	232	15	0	0.00	2.00	22.77	10.840	* STM 2 SAF 4					
291	082901	0	201	6	0	0.00	2.00	8.53	0.1512	* AUX FEED 2					
292	081341	0	132	19	0	0.00	1.00	22.77	23.502	* AUX FEED DRVE					
293	082341	0	232	20	0	0.00	2.00	22.77	10.840	* AUX FEED DRVE					
294	087001	0	701	1	0	935.19	1.0	8.53	0.3024						
295	088001	0	801	3	0	1870.38	2.0	8.53	0.1512						
296	*														
297	*														
298	*8XXX2	FJUNF	FJUNR	JV	JC	CL	MV	DIAMJ	CON	IFRJ	JTPM	ANG	IHQ	ISP	*

299	*****													
300	080012	-1.0	-1.0	1	-1	0	0	2.4170	0.0	0	0	0.0	0	*
301	080022	0.77	0.49	0	-1	0	0	2.4170	0.0	0	0	0.0	0	*
302	080032	0.35	0.48	0	-1	0	0	.0646	0.0	0	0	0.0	0	*
303	080042	0.00	0.00	0	-1	0	0	.0646	0.0	0	0	0.0	0	*
304	*80052	0.00	0.00	0	-1	0	0	.0646	0.0	0	0	0.0	0	*
305	080052	.038	.038	1	-1	0	0	.0646	0.0	0	0	0.0	0	*
306	*80062	0.20	0.20	0	-1	0	0	.0646	0.0	0	0	0.0	0	*
307	*80072	0.00	0.00	0	-1	0	0	.0646	0.0	0	0	0.0	0	*
308	080072	.038	.038	1	-1	0	0	.0646	0.0	0	0	0.0	0	*
309	080082	0.00	0.00	0	-1	0	0	.0646	0.0	0	0	0.0	0	*
310	080092	0.48	0.35	0	-1	0	0	.0646	0.0	0	0	0.0	0	*
311	080102	0.49	0.77	0	-1	0	0	2.5833	0.0	0	0	0.0	0	*
312	080112	0.23	0.23	0	-1	0	0	2.5830	0.0	0	0	0.0	0	*
313	080122	0.00	0.00	0	-1	0	0	2.2917	0.0	0	0	0.0	0	*
314	080132	1.30	4.80	1	-1	0	0	2.4170	0.0	0	0	0.0	0	*
315	080142	0.80	0.80	0	-1	0	0	0.7333	0.0	0	0	0.0	0	*
316	080152	0.00	0.00	0	-1	0	0	0.7333	0.0	0	0	0.0	0	*
317	080162	1.80	1.80	0	-1	0	0	0.7333	0.0	0	0	0.0	0	*
318	080172	2.00	2.00	0	-1	0	0	7.2620	0.0	0	0	0.0	0	*
319	080182	1.60	1.60	0	-1	0	0	7.2620	0.0	0	0	0.0	0	*
320	080192	1.60	1.60	0	-1	0	0	7.2620	0.0	0	0	0.0	0	*
321	080202	3.63	3.63	1	-1	0	0	7.2620	0.0	0	0	0.0	0	*
322	080212	-1.00	-1.00	1	-1	0	0	0.0061	0.0	0	0	0.0	0	*BY-PASS
323	080222	2.08	2.08	1	-1	0	0	0.1950	0.0	0	0	0.0	0	*
324	080232	0.77	0.49	0	-1	0	0	2.4170	0.0	0	0	0.0	0	*
325	080242	0.35	0.48	0	-1	0	0	0.0646	0.0	0	0	0.0	0	*
326	080252	0.00	0.00	0	-1	0	0	0.0646	0.0	0	0	0.0	0	*
327	*80262	0.00	0.00	0	-1	0	0	0.0646	0.0	0	0	0.0	0	*
328	080262	.038	.038	1	-1	0	0	0.0646	0.0	0	0	0.0	0	*
329	*80272	0.20	0.20	0	-1	0	0	0.0646	0.0	0	0	0.0	0	*
330	*80282	0.00	0.00	0	-1	0	0	0.0646	0.0	0	0	0.0	0	*
331	080282	.038	.038	1	-1	0	0	0.0646	0.0	0	0	0.0	0	*
332	080292	0.00	0.00	0	-1	0	0	0.0646	0.0	0	0	0.0	0	*
333	080302	0.48	0.35	0	-1	0	0	0.0646	0.0	0	0	0.0	0	*
334	080312	0.49	0.77	0	-1	0	0	2.5833	0.0	0	0	0.0	0	*
335	080322	.23	.23	0	-1	0	0	2.5830	0.0	0	0	0.0	0	*
336	080332	0.00	0.00	0	-1	0	0	2.2917	0.0	0	0	0.0	0	*
337	080342	1.30	4.80	1	-1	0	0	2.4170	0.0	0	0	0.0	0	*
338	080352	0.80	0.80	0	-1	0	0	0.7333	0.0	0	0	0.0	0	*
339	080362	0.00	0.00	0	-1	0	0	0.7333	0.0	0	0	0.0	0	*
340	080372	1.80	1.80	0	-1	0	0	0.7333	0.0	0	0	0.0	0	*
341	*80382	-1.00	1.+5	0	-1	0	0	0.0117	0.0	0	0	0.0	0	1
342	080392	2.80	2.80	1	-1	0	0	0.8750	0.0	-99	0	0.0	0	*
343	080402	0.00	1.15	0	-1	0	3	0.8750	0.0	0	0	0.0	0	*
344	*80412	0.50	0.50	0	-1	0	0	0.2865	0.0	0	0	0.0	0	*
345	080422	1.50	1.50	0	-1	0	0	0.0195	0.0	0	0	0.0	0	*
346	080432	-1.0	-1.0	1	-1	0	0	2.4170	0.0	0	0	0.0	0	*
347	080442	-1.0	-1.0	0	-1	0	0	.0874	0.0	0	0	0.0	0	*
348	080452	-1.0	-1.0	0	-1	0	0	.0874	0.0	0	0	0.0	0	*
349	*8*712	1.*	1.*	*	*	*	*	1.1284	.*	*	*	.*	*	*
350	*8*722	1.*	1.*	*	*	*	*	1.1284	.*	*	*	.*	*	*
351	*8*732	1.*	1.*	*	*	*	*	1.1284	.*	*	*	.*	*	*
352	*8*742	1.*	1.*	*	*	*	*	1.1284	.*	*	*	.*	*	*
353	***** THIS IS THE BREAK *****													
354	*****													
355	080752	1.5	1.5	0	0	0	0	0.2500	0.0	0	0	0.0	0	*
356	080922	1.0	1.0	0	-1	0	0	0.2187	0.0	0	0	0.0	0	*
357	080942	1.0	1.0	0	-1	0	0	0.7292	0.0	0	0	0.0	0	*
358	080952	1.0	1.0	0	-1	0	0	0.7292	.0	0	0	0.0	0	*

```
359 081002 1.0 0.5 0 -1 2 0 2.3542 0.0 0 0 0.0 0 *
360 081012 0.61 1.01 0 -1 0 0 2.3542 0.0 0 0 0.0 0 *
361 081312 0.59 0.59 0 -1 0 0 1.3333 0.0 0 0 0.0 0 *
362 081322 1.0 1.0 0 -1 0 0 1.1284 0.0 0 0 0.0 0 *
363 081352 1.0 1.0 0 -1 0 0 1.1284 0.0 0 0 0.0 0 *
364 081512 1.0 1.0 0 -1 0 0 1.1284 0.0 0 0 0.0 0 *
365 081522 1.0 1.0 0 -1 0 0 1.1284 0.0 0 0 0.0 0 *
366 081532 1.0 1.0 0 -1 0 0 1.1284 0.0 0 0 0.0 0 *
367 081542 1.0 1.0 0 -1 0 0 1.1284 0.0 0 0 0.0 0 *
368 081902 1.0 0.5 0 -1 0 0 1.1615 0.0 0 0 0.0 0 *
369 082002 1.0 0.5 0 -1 2 0 2.3542 0.0 0 0 0.0 0 *
370 082012 0.61 1.01 0 -1 0 0 2.3542 0.0 0 0 0.0 0 *
371 082312 0.59 0.59 0 -1 0 0 1.3333 0.0 0 0 0.0 0 *
372 082322 1.0 1.0 0 -1 0 0 1.1284 0.0 0 0 0.0 0 *
373 082352 1.0 1.0 0 -1 0 0 1.1284 0.0 0 0 0.0 0 *
374 082512 1.0 1.0 0 -1 0 0 1.1284 0.0 0 0 0.0 0 *
375 082522 1.0 1.0 0 -1 0 0 1.1284 0.0 0 0 0.0 0 *
376 082532 1.0 1.0 0 -1 0 0 1.1284 0.0 0 0 0.0 0 *
377 082542 1.0 1.0 0 -1 0 0 1.1284 0.0 0 0 0.0 0 *
378 082902 1.0 0.5 0 -1 0 0 1.1615 0.0 0 0 0.0 0 *
379 081342 1.0 1.0 1 -1 0 0 0.1616 0.0 0 0 0.0 0 *
380 082342 1.0 1.0 1 -1 0 0 0.1616 0.0 0 0 0.0 0 *
381 087002 1.0 0.5 0 -1 0 0 1.1615 0.0 0 0 0.0 0
382 088002 1.0 0.5 0 -1 0 0 1.1615 0.0 0 0 0.0 0
383 *
384 *****
385 *****
386 *****
387 *****
388 * PUMP DATA
389 *
390 *90XXY IPC TRP REV 2PH IMT RPM SRAT GPM HEAD TORQUE INER DEN TORK
391 090011 1 16 0 0 0 1190. 1.0 88500. 277.0 23900. 82355.2 47.18 0.0
392 090021 1 16 0 0 0 1190. 1.0 177000. 277.0 47800. 164710.4 47.18 0.0
393 *
394 *
395 *90XX2 TORKF1 TORKF2 TORKF3 TORKF4
396 090012 1202.
397 090022 2404.
398 *
399 ***** PUMP CURVE INDICATOR
400 *
401 *100000 FLAGJ NCURVEJ
402 100000 0 8
403 *****
404 *****
405 ***** PUMP HEAD DATA - HOMOLOGOUS CURVES - *****
406 *****
407 *****
408 *****
409 *
410 101011 4 0.0 1.75 0.6 1.25 0.8 1.25 1.0 1.0 *HEAD CURVE 1
411 101021 4 0.0 -1.55 0.6 -0.15 0.7 0.10 1.0 1.0 *HEAD CURVE 2
412 101031 2 -1.0 4.24 0.0 1.75 *HEAD CURVE 3
413 101041 2 -1.0 4.25 0.0 1.65 *HEAD CURVE 4
414 101091 2 0.0 0.95 1.0 1.0 *TORQUE CURVE 9
415 101101 2 0.0 -1.50 1.0 1.0 *TORQUE CURVE 10
416 101111 2 -1.0 3.05 0.0 0.95 *TORQUE CURVE 11
417 101121 2 -1.0 3.05 0.0 1.45
418 *****
```

```

419 *****
420 *****
421 *****
422 *VALVE DATA
423 *11XXXO ITCV IACV IACV2 PCV CV1 CV2 CV3
424 110010 -15 1 2 0.0 .0 0.0 0.0
425 *12XXYY NAREA TAREA1 TAREA2 TAERA1 TAREA2 *
426 120101 -4 0.00 0.00 0.001 0.00 *BREAK OPENS
427 120102 0.002 1.00 9.000 1.00 *BREAK OPENS
428 120201 -4 0.00 1.00 0.001 1.00 *BREAK CLOSES
429 120202 0.002 0.00 9.000 0.00 *BREAK CLOSES
430 120301 -2 0.00 0.00 30.6 -476.01 *DUMP 1 FNG AREA
431 120401 -2 0.00 0.00 30.6 -476.01 *DUMP 2 FNG AREA
432 *13XXYY NFILL ITFILL JX JY FILTLB1 FILTLB2 FILENT1 FILPRS1 *
433 130101 -2 3 0 0 0.0 935.19 417.93 825.4 *FW 1
434 130102 50.0 935.19 417.93 825.4 *
435 130201 -2 4 0 0 0.0 -935.19 1198.4 774.2 *ST 1
436 130202 50.0 -935.19 1198.4 774.2 *
437 130301 -2 9 0 0 0.0 935.19 417.93 825.4 *FW 2
438 130302 50.0 935.19 417.93 825.4 *
439 130401 -2 10 0 0 0.0 -935.19 1198.4 774.2 *ST 2
440 130402 50.0 -935.19 1198.4 774.2 *
441 130501 -2 19 0 0 0.0 41.75 51.5 1300.0 *AUXFW 1
442 130502 50.0 41.75 51.5 1300.0 *
443 130601 -2 20 0 0 0.0 41.75 51.5 1300.0 *AUXFW 2
444 130602 50.0 41.75 51.5 1300.0 *
445 130701 -7 2 39 0 15.0 48.50 52.0 1500.0 * SI
446 130702 615.0 37.00 52.0 1500.0 *SI
447 130703 1015.0 26.67 52.0 1500.0 *SI
448 130704 1265.0 18.33 52.0 1500.0 *SI
449 130705 1415.0 6.67 52.0 1500.0 *SI
450 130706 1470.0 0.0 52.0 1500.0 *SI
451 130707 1800.0 0.0 52.0 1500.0 *SI
452 130801 -2 5 132 0 1100.0 -183.65 1.0 1.0 *SAF1 STM1
453 130802 1125.0 -188.80 1.0 1.0 *SAF1 STM1
454 130901 -2 6 132 0 1100.0 -183.65 1.0 1.0 *SAF2 STM1
455 130902 1125.0 -188.80 1.0 1.0 *SAF2 STM1
456 131001 -2 7 132 0 1140.0 -278.27 1.0 1.0 *SAF3 STM1
457 131002 1155.0 -281.93 1.0 1.0 *SAF3 STM1
458 131101 -2 8 132 0 1140.0 -278.27 1.0 1.0 *SAF4 STM1
459 131102 1155.0 -281.93 1.0 1.0 *SAF4 STM1
460 131201 -2 11 232 0 1100.0 -183.65 1.0 1.0 *SAF1 STM2
461 131202 1125.0 -188.80 1.0 1.0 *SAF1 STM2
462 131301 -2 12 232 0 1100.0 -183.65 1.0 1.0 *SAF2 STM2
463 131302 1125.0 -188.80 1.0 1.0 *SAF2 STM2
464 131401 -2 13 232 0 1140.0 -278.27 1.0 1.0 *SAF3 STM2
465 131402 1155.0 -281.93 1.0 1.0 *SAF3 STM2
466 131501 -2 14 232 0 1140.0 -278.27 1.0 1.0 *SAF4 STM2
467 131502 1155.0 -281.93 1.0 1.0 *SAF4 STM2
468 131601 -2 2 0 0 0.0 24.00 55.0 2725.0 *CHARGING
469 131602 50.0 24.00 55.0 2725.0 *
470 131701 -1 1000 -13 0 1.0 -476.01 1.0 1.0 *STM DMP 1
471 131801 -1 1000 -14 0 1.0 -476.01 1.0 1.0 *STM DMP 2
472 131901 -2 19 0 0 0.0 -.3703 1100.0 1000.0 *AUX PUMP
473 131902 50.0 -.3703 1100.0 1000.0 *STEAM 1
474 132001 -2 20 0 0 0.0 -.3703 1100.0 1000.0 *AUX PUMP
475 132002 50.0 -.3703 1100.0 1000.0 *STEAM 2
476 *****
477 *140000 KMUL BVOL RHOIN UDUF PROMPT LAMBDA TAU *
478 *140000 1. 263. 0.0

```

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479 *** THIS IS TO REPRESENT BEGINNING OF LIFE CONDITIONS
480 *140XX0 DENWT FTWT ALPHTM ALPHTW *
481 *140010 0.333 0.333 -5.557E-4 0.0
482 *140020 0.333 0.333 -5.557E-4 0.0
483 *140030 0.334 0.334 -5.557E-4 0.0
484 * SCRAM TABLE DATA
485 *141XXY NSCR ITSCRM TIME NORCORPWR TIME NORCORPWR
486 *141101 -12 16 0.0 1.0 1.0 .1535 2.0 .1273 4.0 .1008
487 *141102 6.0 .0871 8.0 .0809 10.0 .0771 20.0 .0676 40.0 .0455
488 *141103 60.0 .0372 80.0 .0353 100.0 .0337
489 *141101 -9 16 0.0 0.0 1.0 -1.18 1.2 -1.88
490 *141102 1.4 -3.00 1.6 -4.720 1.8 -8.400
491 *141103 2.0 -9.88 2.2 -9.950 9.0 -10.01
492 *1420XX NDEN
493 *142001 0
494 *143001 0
495 *
496 * HEAT CONDUCTOR DATA
497 *
498 *15XXX1 VSL VSR GOM ELEV MCL MCR ASUL ASUR VOLS
499 150011 0 18 1 000.00 10 10 0.0 14220.8 125.60 *LW CORE
500 150021 0 19 1 0.00 10 10 0.0 14220.8 125.60 *MID CORE
501 150031 0 20 1 0.00 10 10 0.0 14220.8 125.60 *UP CORE
502 150041 4 201 2 4.35 2 2 11498.6 12964.0 51.12 *LW HOT SG 2
503 150051 5 201 2 13.98 2 2 13955.8 15734.0 62.08 *MID HOT SG 2
504 *50061 6 201 2 23.92 2 2 13954.0 15732.0 61.60 *U HOT SG 2
505 150061 7 201 2 23.92 2 2 13954.0 15732.0 61.60 *U HOT SG 2
506 150091 9 201 2 4.35 2 2 11498.6 12964.0 51.12 *LW COLD SG 2
507 150081 8 201 2 13.98 2 2 13955.8 15734.0 62.08 *MID COLD SG 2
508 150071 7 201 2 23.92 2 2 13954.0 15732.0 61.60 *U COLD SG 2
509 150101 25 101 2 4.35 2 2 5749.3 6482.0 25.56 *LW HOT SG 1
510 150111 26 101 2 13.98 2 2 6977.9 7867.0 31.04 *MID HOT SG 1
511 *50121 27 101 2 23.92 2 2 6977.0 7866.0 30.80 *U HOT SG 1
512 150121 28 101 2 23.92 2 2 6977.0 7866.0 30.80 *U HOT SG 1
513 150151 30 101 2 4.35 2 2 5749.3 6482.0 25.56 *LW COLD SG 1
514 150141 29 101 2 13.98 2 2 6977.9 7867.0 31.04 *MID COLD SG 1
515 150131 28 101 2 23.92 2 2 6977.0 7866.0 30.80 *U COLD SG 1
516 150161 0 2 5 0.00 2 2 0.0 296.0 67.00 *HT LEG 2
517 150261 0 23 5 0.00 2 2 0.0 148.0 33.50 *HT LEG 1
518 150171 0 3 6 0.00 2 2 0.0 2736.6 206.00 *SG 2 PLM
519 150181 0 10 6 0.00 2 2 0.0 2736.6 206.00 *SG 2 PLM
520 150271 0 24 6 0.00 2 2 0.0 1368.3 103.0 *SG 1 PLM
521 150281 0 31 6 0.00 2 2 0.0 1368.3 103.0 *SG 1 PLM
522 150191 0 11 8 0.00 2 2 0.0 438.0 104.00 *PUMP SUC
523 150291 0 32 8 0.00 2 2 0.0 219.0 52.00 *PUMP SUC
524 150201 0 12 8 0.00 2 2 0.0 353.4 504.6 *PUMP 2
525 150301 0 33 8 0.00 2 2 0.00 176.7 252.3 *PUMP 1
526 150211 0 13 9 0.00 2 2 0.0 256.0 55.20 *C LEG 2
527 150311 0 34 9 0.00 2 2 0.0 128.0 27.60 *C LEG 1
528 150221 0 14 3 0.00 2 2 0.0 242.4 200.00 *RX PLM 2
529 150231 0 15 3 0.00 2 2 0.0 242.4 200.00 *RX PLM 2
530 150241 0 16 3 0.00 2 2 0.0 242.4 200.00 *RX PLM 2
531 150321 0 35 3 0.00 2 2 0.0 121.2 100.00 *RX PLM 1
532 150331 0 36 3 0.00 2 2 0.0 121.2 100.00 *RX PLM 1
533 150341 0 37 3 0.00 2 2 0.0 121.2 100.00 *RX PLM 1
534 150251 0 17 7 0.00 2 2 0.0 277.7 121.94 *LOW PLM
535 150351 0 22 4 0.00 2 2 0.0 243.2 272.20 *UPPER HEAD
536 *15XXX2 HDML HDMR DHDL DHER CHNL CHNR IHXQF *
537 150012 0.0 0.0 0.0 0.0466 0.0 4.0 0 *
538 150022 0.0 0.0 0.0 0.0466 0.0 4.0 0 *

```

539	150032	0.0	0.0	0.0	0.0466	0.0	4.0	0	*
540	150042	0.0	.11185	0.0	0.11185	8.71	8.71	2	*
541	150052	0.0	.11185	0.0	0.11185	10.54	10.54	2	*
542	150062	0.0	.11185	0.0	0.11185	9.34	9.34	2	*
543	150092	0.0	.11185	0.0	0.11185	8.71	8.71	2	*
544	150082	0.0	.11185	0.0	0.11185	10.54	10.54	2	*
545	150072	0.0	.11185	0.0	0.11185	9.34	9.34	2	*
546	150102	0.0	.11185	0.0	0.11185	8.71	8.71	1	*
547	150112	0.0	.11185	0.0	0.11185	10.54	10.54	1	*
548	150122	0.0	.11185	0.0	0.11185	9.34	9.34	1	*
549	150152	0.0	.11185	0.0	0.11185	8.71	8.71	1	*
550	150142	0.0	.11185	0.0	0.11185	10.54	10.54	1	*
551	150132	0.0	.11185	0.0	0.11185	9.34	9.34	1	*
552	150162	0.0	2.42	0.0	2.42	0.00	20.80	0	*
553	150262	0.0	2.42	0.0	2.42	0.00	20.80	0	*
554	150172	0.0	6.00	0.0	6.00	.00	0.00	0	*
555	150182	0.0	6.00	0.0	6.00	.00	0.00	0	*
556	150272	0.0	6.00	0.0	6.00	0.00	0.00	0	*
557	150282	0.0	6.00	0.0	6.00	0.00	0.00	0	*
558	150192	0.0	2.58	0.0	2.58	0.00	0.00	0	*
559	150292	0.0	2.58	0.0	2.58	0.00	0.00	0	*
560	150202	0.0	3.50	0.0	3.50	0.00	0.00	0	*
561	150302	0.0	3.5	0.0	3.50	0.00	0.00	0	*
562	150212	0.0	2.29	0.0	2.29	0.00	19.80	0	*
563	150312	0.0	2.29	0.0	2.29	0.00	19.80	0	*
564	150222	0.0	0.00	0.0	1.47	0.00	0.00	0	*
565	150232	0.0	0.00	0.0	1.47	0.00	.00	0	*
566	150242	0.0	0.00	0.0	1.47	0.00	0.00	0	*
567	150322	0.0	0.00	0.0	1.47	0.00	0.00	0	*
568	150332	0.0	0.00	0.0	1.47	0.00	.00	0	*
569	150342	0.00	0.00	0.0	1.47	0.00	0.00	0	*
570	150252	0.00	0.68	0.0	0.00	0.00	0.00	0	*
571	150352	0.00	0.00	0.0	0.00	0.00	0.00	0	*

572 *

573 * CORE SECTION DATA

574 *

575 *16XXX0 ISLB CLTI QFRAC QFRACR IRGF IRGL

576 *

577 160010 1 0.0 0.33454

578 160020 2 0.0 0.35695

579 160030 3 0.0 0.30851

580 *

581 * CONDUCTOR GEOMETRY DATA

582 *

583 *17XXYY IG NR GAP IM SP RADDIST REGWIDTH PFRAC

584 170101 2 3 1 6 0.0 0.01485 1.0

585 170102 0 3 2 3.125E-4 0.0

586 170103 0 2 4 2.5000E-3 0.0

587 170201 2 1 4 3 0.0323 4.1667E-3 0.0

588 170301 1 1 6 3 0.0 .822 0.0

589 170401 1 1 6 3 0.0 1.126 0.0

590 170501 1 1 5 3 0.0 .2083 0.0

591 170601 1 1 6 3 0.0 .0753 0.0

592 170701 1 1 6 3 0.0 .4322 0.0

593 170801 1 1 5 3 0.0 .794 0.0

594 170901 1 1 5 3 0.0 .2152 0.0

595 *

596 *18XXYY THERMAL CONDUCTIVITY DATA

597 *

598 * THERM COND UO2 REF GEMP-482 FIG-13 86 W/CM

*UO-2 PELLETS
 *GAP (HELIUM)
 *CLADDING (ZR-4)
 *S-G TUBES
 *DOWNCOMMER RX
 *UPPER HEAD
 *HOT LEG
 *SG PLM
 *LOWER HEAD
 *PUMP LINE
 *COLD LEG

599 180101 -11 *THERM COND U02
600 180102 212. 4.28 392. 3.47 752. 2.66 1112. 2.20 * THERM COND U02
601 180103 1472. 1.88 1832. 1.62 2192. 1.44 2912. 1.21 * THERM COND U02
602 180104 3632. 1.16 5072. 1.16 5500. 1.16 * THERM COND U02
603 *
604 * THERMAL COND ZR-4 REF BRASSFIELD%1968<GEMP-482 RECOM... LWR LOCA
605 180201 -8 0. 8. 1490. 12.32 2150. 17.5 *THERM COND ZR-4 1
606 180202 2372. 19.7 2552. 21.8 2732. 24.0 3292. 28.9 *THERM COND ZR-4 2
607 180203 3360. 33.1 *THERM COND ZR-4 3
608 *
609 * THERMAL COND HELIUM REF THETA1-B EQN
610 180301 -6 *THERM COND HELIUM1
611 180302 100. .0937 1100. .163 2100. .212 3100. .253 *THERM COND HELIUM2
612 180303 4100. .289 5100. .322 *THERM COND HELIUM3
613 *
614 * THERMAL COND INCONEL 600 REF NUC. SYSTEMS MATLS HANDBOOK TID-26666
615 180401 -8 100. 8.5 300. 9.5 400. 10.0 *TH. COND INCONEL
616 180402 500. 10.5 600. 11.0 700. 11.5 *TH. COND INCONEL
617 180403 900. 12.6 1100. 13.8 *TH. COND INCONEL
618 * THERMAL CONDUCTIVITY FOR STAINLESS STEEL ** EI DATA
619 180501 -3 0.0 9.0 200.0 9.0 1600.0 15.0
620 * THERMAL CONDUCTIVITY FOR CARBON STEEL ** CE DATA
621 180601 -2 70.0 31.5 1000.0 22.4
622 *
623 *
624 *
625 *19XXYY VOLUMETRIC HEAT CAPACITY DATA
626 *
627 * SPEC HEAT U02 REF BRASSFIELD%1968<GEMP-482 RECOM...LWR LOCA
628 * SPEC HEAT U02 95 PCT TH DEN AT 1000F 642 LB/FT3
629 * SPEC HEAT U02 REF BRASSFIELD%1968<GEMP-482 TOULOUKIAN SAME TO 3750 F
630 190101 -19 *VOL HT CAP U02 1
631 190102 77. 36.22 100. 37.12 200. 40.05 *VOL HT CAP U02 2
632 190103 300. 41.98 400. 43.88 600. 45.18 *VOL HT CAP U02 3
633 190104 800. 46.41 1000. 47.32 *VOL HT CAP U02 4
634 190105 2400. 50.77 *VOL HT CAP U02 5
635 190106 2600. 51.43 2800. 52.61 3000. 54.57 *VOL HT CAP U02 6
636 190107 3200. 57.42 3400. 61.23 3600. 65.93 *VOL HT CAP U02 7
637 190108 4600. 95.15 4800. 99.31 5000. 101.57 *VOL HT CAP U02 8
638 190109 5074. 101.76 *VOL HT CAP U02 9
639 *
640 * SPEC HEAT ZR-2 REF BMI-1803 ELDRIDGE ET AL (1967) DEN 409.55
641 190201 15 *VOL HT CAP ZR-2 1
642 190202 32. 28.75 932. 32.56 1112. 34.40 *VOL HT CAP ZR-2 2
643 190203 1184. 35.22 1490. 35.22 1508. 49.14 *VOL HT CAP ZR-2 3
644 190204 1544. 57.74 1580. 60.20 1616. 70.43 *VOL HT CAP ZR-2 4
645 190205 1652. 79.85 1688. 75.35 1724. 59.38 *VOL HT CAP ZR-2 5
646 190206 1760. 45.86 1787. 34.81 3300. 34.81 *VOL HT CAP ZR-2 6
647 * SPEC HEAT HELIUM REF KREITH AT 1 ATM DEN 0.012 LB/FT3
648 190301 -2 32. .519 3400. .519 *VOL HT CAP HELIUM1
649 *
650 * SPEC HEAT INCONEL 600 REF NUC. SYSTEMS MATLS HANDBOOK TID-26666
651 190401 -8 100. 55.4 300. 58.8 400. 60.1 *VOL HT CAP INCONEL
652 190402 500. 61.1 600. 62.1 700. 63.0 *VOL HT CAP INCONEL
653 190403 900. 65.6 1100. 69.2 *VOL HT CAP INCONEL
654 * HEAT CAPACITANCE FOR STAINLESS STEEL
655 190501 -2 200. 60. 2200. 80.
656 * HEAT CAPACITANCE FOR CARBON STEEL
657 190601 -2 0. 60. 2000. 80.
658 *

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659 *2200YX ISHD LENS DZ TQCH NCON NCON NCON
660 220011 -1 3 0.0 0.0 4 5 6
661 220021 -1 3 0.0 0.0 9 8 7
662 220031 -1 3 0.0 0.0 10 11 12
663 220041 -1 3 0.0 0.0 15 14 13
664 *230000 STEADY-STATE INITIALIZATION CRITERIA
665 *
666 230000 25 0.0 0.0 0.0
667 *
668 *230XXY STEADY-STATE POWER REMOVAL SYSTEM DATA
669 * ISGNUM JBIAS JBAL POWF
670 230011 1 700 101 0.333333333
671 230021 2 800 201 0.666666667
672 *
673 *71000 NCI NCB DTCMAX
674 701000 13 26 .05
675 *****
676 *****
677 *702XXX IDC CSYM IREG GAIN CIC
678 702001 1 TEMP 2 1.0 604.00 * THOT
679 702002 2 TEMP 13 1.0 547.00 * TCOLD
680 702003 3 WP** 94 1.0 0.00 * SI LOOP 2
681 702004 4 WP** 95 1.0 0.00 * SI LOOP 1
682 702005 5 TEMP 23 1.0 604.00 * THOT 1
683 702006 6 TEMP 34 1.0 547.00 * TCOLD 1
684 702007 7 TRIP 19 1.0 0.00 *
685 702008 8 TRIP 20 1.0 0.00 *
686 702009 9 CONS 0 547.2 547.20 * NO LOAD TAVE
687 *703XXX IDC ITYPE INC1 INC2 CGAIN CP1 CP1 CIC CMIN CMAX*
688 703001 -1 SUM 1 2 1.0 0.5 0.5 575.50 *TAVE
689 703002 -2 SUM 3 4 1.0 1.0 1.0 0.00 * SI FLOW
690 703003 -3 INT -2 0 1.0 0.0 0.0 0.00 * INT SI
691 703004 -4 SUM 5 6 1.0 0.5 0.5 575.50 *TAVE 1
692 703005 -5 LLG -4 0 1.0 25.0 5.0 0.00 *
693 703006 -6 LLG -1 0 1.0 25.0 5.0 0.00 *
694 703007 -7 SUM -5 9 1.0 1.0 -1.0 28.50 *
695 703008 -8 SUM -6 9 1.0 1.0 -1.0 28.50 *
696 703009 -9 LAG 7 0 1.0 0.5 0.0 0.00 0.0 1.0
697 703010 -10 LAG 8 0 1.0 0.5 0.0 0.00 0.0 1.0
698 703011 -11 MUL -9 -7 1.0 0.0 0.0 0.00 *
699 703012 -12 MUL -10 -8 1.0 0.0 0.0 0.00 *
700 703013 -13 FNG -11 3 1.0 0.0 0.0 0.00 -476.01 0.0
701 703014 -14 FNG -12 4 1.0 0.0 0.0 0.00 -476.01 0.0
702 *
703 *
704 * ROB3 ACCUMULATOR ADDITIONS
705 *
706 *10001 LDMP NEDI NTC NTRP NVOL NBUB NTDV NJUN NPMP NCKV NLK NLL NSLB NGOM
707 010001 -1 +51 1 45 50 8 3 75 2 3 6 22 35 9
708 *
709 *
710 *
711 * ACCUMULATOR TRIP LOGIC
712 *
713 040350 21 -4 13 0 614.70 0.0 * OPEN DBL. ACCUM.
714 040360 -21 -6 500 0 0.25 0.0 * CLOSE DBL. ACCUM.
715 040370 -21 -9 500 0 -0.001 0.0 * RESET ON REVERSE FLOW
716 *
717 040380 22 -4 34 0 614.70 0.0 * OPEN DBL. ACCUM.
718 040390 -22 -6 501 0 0.25 0.0 * CLOSE DBL. ACCUM.

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*** THIS CARD IS A REPLACEMENT CARD. ***

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719 040400 -22 -9 501 0 -0.001 0.0 * RESET ON REVERSE FLOW
720 040410 23 1 0 0 5000.0 0.0 * VESSEL CRACK 1
721 040420 24 1 0 0 5000.0 0.0 * VESSEL CRACK 2
722 *
723 *
724 * VOLUME DATA
725 *
726 *5XXX1 IBUB IREAD PRESS TEMP QUALITY VOLUME ZVOL ZM *
727 *5XXX2 FLOWL FLOWA DIAMV ELEV INEQ VRRAIN VLHTC IPVUB MESH *
728 055001 6 0 614.7 80.0 1.0 2513.8 17.34 12.39 * DLB LOOP ACC
729 055002 17.34 145.00 9.61 -.078
730 055011 7 0 614.7 80.0 1.0 1256.9 17.34 12.39 * SNG LOOP ACC
731 055012 17.34 72.49 9.61 -.078
732 *
733 *
734 *
735 *
736 * BUBBLE RISE INPUT
737 *
738 *6XXX1 ALPHA VBUB ICBG ICBV
739 060061 0.8 10.0
740 060071 0.8 10.0
741 060081 0.8 5.0
742 *
743 *
744 *
745 *
746 * JUNCTION DATA
747 *
748 *8XXX1 FM TO PMP VLV FLOWRATE AJUN ZJUN INERTIA *
749 *85001 500 13 0 2 0.0 1.10 -0.83 30.0 * DBL ACCUM JUN
750 *85011 501 34 0 3 0.0 0.55 -0.83 30.0 * SNG ACCUM JUN
751 085001 500 13 0 2 0.0 .836 -.078 100.0 * DBL ACCUM JUN
752 085011 501 34 0 3 0.0 .418 -.078 200.0 * SNG ACCUM JUN
753 086001 0 15 21 0 0.0 1.00 -7.0 1.0 * DBL ACCUM JUN
754 086011 0 36 22 0 0.0 1.00 -7.0 1.0 * SNG ACCUM JUN
755 *
756 *
757 *8XXX2 FJUNF FJUNR JV JC CL MV DIAMJ CON IFRJ JTPM ANG IHQ ISP *
758 085002 7.38 1.0E20 1 -1 0 3 .729 1.0 0 0 0.0 0
759 085012 7.38 1.0E20 1 -1 0 3 .729 1.0 0 0 0.0 0
760 086002 1.0 1.0 0 -1 0 0 1.0 1.0 0 0 0.0 0
761 086012 1.0 1.0 0 -1 0 0 1.0 1.0 0 0 0.0 0
762 *
763 *
764 * ACCUMULATOR VALVES
765 *
766 110020 -21 5 0 0.0 0.0 0.0 0.0 * DBL. ACCUM. VALVE
767 110030 -22 6 0 0.0 0.0 0.0 0.0 * SNG. ACCUM. VALVE
768 *
769 *
770 * ACCUM. VALVE GEN. DATA TABLE
771 *
772 120501 -3 0.0 0.0 0.1 1.0 1.E6 1.0 * OPEN DBL. ACCUM
773 120601 -3 0.0 0.0 0.1 1.0 1.E6 1.0 * OPEN SNG. ACCUM
774 *
775 132101 -2 23 1 0 0.0 0.0 500.0 500.0
776 132102 2000.0 10.0 500.0 500.0
777 132201 -2 24 1 0 0.0 0.0 500.0 500.0
778 132202 2000.0 10.0 500.0 500.0

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779 *
780 *
781 *
782 040500 30 14 -25 0 0.0 0.0 *REACT DELT
783 040510 30 14 -26 0 0.0 0.0 *REACT DELT
784 040530 30 12 16 0 0 0.0 *REACT DELT
785 702010 10 PRES 39 1.0 2250.0 *PRESSURIZER PRES
786 702011 11 CONS 0 2250.0 2250.0 *PRESSURIZER PRES
787 702012 12 CONS 0 1.162 1.162
788 702013 13 CONS 0 575.46 575.46
789 703015 -15 SUM 1 2 1.0 1.0 -1.0 57.5 *DELT2
790 703016 -16 SUM 5 6 1.0 1.0 -1.0 57.5 *DELT1
791 703017 -17 SUM 10 11 7.978E-4 1.0 -1.0 0.0 *PRZER
792 703018 -18 SUM -1 13 1.0 1.0 -1.0 0.0 *AVT REACT -575F
793 703019 -19 SUM -4 13 1.0 1.0 -1.0 0.0 *AVT REACT -575F
794 703021 -21 LLG -18 0 0.01035 0.207 3.0 0.0
795 703022 -22 LLG -19 0 0.01035 0.207 3.0 0.0
796 703020 -20 SUM 12 -17 1.0 1.0 1.0 1.162
797 703023 -23 SUM -20 -21 57.5 1.0 -1.0 66.8 *DELT SET
798 703024 -24 SUM -20 -22 57.5 1.0 -1.0 66.8 *DELT SET
799 703025 -25 SUM -15 -23 1.0 1.0 -1.0 -9.3
800 703026 -26 SUM -16 -24 1.0 1.0 -1.0 -9.3
801 **** POWER TABLE
802 141101 9 30 0.0 1.0 0.2 0.973
803 141102 0.6 0.53 0.8 0.29
804 141103 1.16 0.1 2.2 0.06
805 141104 4.3 0.05 7.7 0.035
806 141105 800.0 0.02
807 * STEAMLINES
808 * REPLACEMENT TO REMOVE FLOW BC
809 *8XXX1 FM TO PMP VLV FLOWRATE AJUN ZJUN INERTIA *
810 081321 0 132 2 0 0.0 1.00 22.77 23.1500 * MSIV 1
811 082321 0 232 4 0 0.0 2.00 22.77 10.840 * MSIV 2
812 *8XXX29 FJUNF FJUNR JV JC CL MV DIAMJ CON IFRJ JTPM ANG IHQ ISP *
813 081322 1.0 1.0 0 -1 0 0 1.1284 0.0 0 0 0.0 0 *
814 082322 1.0 1.0 0 -1 0 0 1.1284 0.0 0 0 0.0 0 *
815 *13XXYY NFILL ITFILL JX JY FILTLB1 FILTLB2 FILENT1 FILPRS1 *
816 130201 -2 10 0 0 0.0 0.0 1198.4 774.2 *ST 1
817 130202 1000.0 0.0 1198.4 774.2 *
818 130401 -2 10 0 0 0.0 0.0 1198.4 774.2 *ST 2
819 130402 1000.0 0.0 1198.4 774.2 *
820 * ADDITION TO INSTALL PRESSURE BC
821 * VOLUME DATA
822 *5XXX1 IBUB IREAD PRESS ENTHY QUALITY VOLUME ZVOL ZM *
823 059011 0 2 790.0 0.0 0.0 1.014 13.63 13.63 *STEAMLIN
824 059021 0 3 790.0 0.0 0.0 2.028 13.63 13.63 *STEAMLIN
825 *5XXX2 FLOWL FLOWA DIAMV ELEV INEQ VRAIN VLHTC IPVBUB MESH *
826 059012 0.0 3.09 1.985 22.77 *STEAMLIN
827 059022 0.0 6.18 1.985 22.77 *STEAMLIN
828 *TIME DEPENDENT VOLUME
829 * IRIN TIME P TEMP C M LEVEL
830 070201 2 0.0 790.0 518.22 0.0 13.63
831 070202 9999.0 790.0 518.22 0.0 13.63
832 070301 2 0.0 790.0 518.22 0.0 13.63
833 070302 9999.0 790.0 518.22 0.0 13.63
834 * JUNCTION DATA
835 *8XXX1 FM TO PMP VLV FLOWRATE AJUN ZJUN INERTIA *
836 089011 132 901 0 0 935.19 3.09 22.77 0.0 *
837 089021 232 902 0 0 1870.38 6.18 22.77 0.0 *
838 *8XXX2 FJUNF FJUNR JV JC CL MV DIAMJ CON IFRJ JTPM ANG IHQ ISP *

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*** THIS CARD IS A REPLACEMENT CARD. ***
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839	089012	-1.0	-1.0	0	-1	2	0	1.985	0.0	0	0	0.0	0	*
840	089022	-1.0	-1.0	0	-1	2	0	1.985	0.0	0	0	0.0	0	*
841	.													

***CARD INPUT USED TO CREATE VERSION 0 OF FILE MINETD ***

1D 1,1,2,0.5,0.443,1.5E-5,1,1/	CARD	2
1D 2,1,2,10.8,0.443,1.5E-5,1,1/	CARD	3
1D 3,1,2,22.15,0.443,1.5E-5,2,1/	CARD	4
1D 4,1,2,50.529,0.353,1.5E-5,3,2/	CARD	5
1D 5,1,2,50.529,0.353,1.5E-5,3,1/	CARD	6
201D 201,1,2,3.186,0.353,1.5E-6,1,2/	CARD	7
301D 301,1,2,12.67,0.0144,4.5E-6,1,1,3,4,1.5875E-2, 2.0137,2100,1,6,0.0,1.,0.0,1,1,0.941E3,0.184E5/	CARD	8
401D 401,1/	CARD	9
402D 402,1/	CARD	10
401D 403,1/	CARD	11
402D 404,1/	CARD	12
402D 406,1/	CARD	13
501D 101,2,35.34,3.0,0.0,1.0,3.186,1,1/	CARD	14
511D 101,1/	CARD	15
512D 101,2/	CARD	16
512D 101,3/	CARD	17
801D 401,1/	CARD	18
801D 403,1/	CARD	19
901D 0.0,401,1,1,1/	CARD	20
901D 0.0,1,2,201,1/	CARD	21
901D 3.186,201,2,2,1/	CARD	22
901D 3.186,2,2,301,1/	CARD	23
901D 3.186,301,2,3,1/	CARD	24
901D 3.186,3,2,101,1/	CARD	25
901D 3.186,3,2,101,1/	CARD	26

901D 3.186,101,2,5,1/	CARD	27
901D 0.0,5,2,402,1/	CARD	28
901D 3.186,101,3,4,1/	CARD	29
901D 0.0,4,2,404,1/	CARD	30
901D 3.686,403,1,301,3/	CARD	31
901D 2.686,301,4,406,1/	CARD	32
1001D 2,9.37/	CARD	33
1001D 3,10.31/	CARD	34
1001D 4,10.31/	CARD	35
1001D 5,10.31/	CARD	36
1201D 201,0.0,704.0565,507.492,3570.0,1.2772,-0.6397, 1.2513,-1.1053,0.2167,5.0,20.0/	CARD	37
1301D 301,0.5,0.5,3,3,-1.0/	CARD	38
2201D 201,0.0,3570.0/	CARD	39
2301D 301,207.2E6/	CARD	40
2401D 401,0,1,0.808474E6,1272.61,1000.0/	CARD	41
2401D 403,0,1,2.74E6,181.93,4.2E6/	CARD	42
2401D 402,1,1,9.7126E5,424.202,5.7725E6/	CARD	43
2401D 404,1,1,9.7126E5,828.404,5.7725E6/	CARD	44
2401D 406,1,1,1.60E6,181.93,4.2E6/	CARD	45
2501D 101,0.0,0.0,7.112E6/	CARD	46
2511D 101,2,424.202/	CARD	47
2511D,101,3,848.404/	CARD	48
3201D 201,9999.9/	CARD	49
3221D 201,0.0,3570.0,999.0,3570.0/	CARD	50
3411D 401,1,1,0.0,0.80847E6,1272.61,9999.0,0.80847E6,1272.61/	CARD	51
3411D 403,1,1,0.0,2.74E6,181.93,9999.0,2.74E6,181.93/	CARD	52
3411D 406,2,1,0.0,1.6E6,4.2E6,9999.0,1.6E6,4.2E6/	CARD	53
3411D 402,2,1,0.0,9.7126E5,5.7725E6,999.0,9.7126E5,5.7725E6/	CARD	54
3411D 404,2,1,0.0,9.7126E5,5.7725E6,999.0,9.7126E5,5.7725E6/	CARD	55
	CARD	56

/* ** * MAIN STEAM LINE FLOW PATH * ** */

1D 21 1,2,0.1,0.605,1.5E-5,1,1/	CARD 57
1D 22,1,2,27.627,0.68,1.5E-5,3,3/	CARD 58
1D 23,1,2,0.1,0.605,1.5E-5,1,2/	CARD 59
101D 501,1,2,1.2,0.605,1.5E-4,1,1,0.287,1.0E-5,1.5/	CARD 60
101D 502,1,2,1.2,0.605,1.5E-4,1,1,0.287,1.0E-5,1.5/	CARD 61
401D 411,1/	CARD 62
401D 413,1/	CARD 63
402D 412,1/	CARD 64
402D 414,1/	CARD 65
402D 416,1/	CARD 66
501D 111,2,35.34,3.0,0.0,1.0,19.79,1,1/	CARD 67
501D 112,2,35.34,3.0,0.0,1.0,19.79,1,1/	CARD 68
511D 111,1/	CARD 69
512D 111,2/	CARD 70
511D 111,3/	CARD 71
512D 111,4/	CARD 72
511D 112,1/	CARD 73
512D 112,2/	CARD 74
512D 112,3/	CARD 75
601D 601,1,2,15.0/	CARD 76
801D 411,1/	CARD 77
801D 413,1/	CARD 78
901D 18.29,411,1,21,1/	CARD 79
901D 19.29,21,2,111,1/	CARD 80
901D 19.79,111,2,22,1/	CARD 81
901D 19.79,22,2,112,1/	CARD 82
901D 19.79,112,2,601,1/	CARD 83
901D 19.79,601,2,412,1/	CARD 84
901D 18.29,413,1,23,1/	CARD 85
	CARD 86

901D 19.29,23,2,111,3/	CARD	87
901D 19.29,112,3,502,1/	CARD	88
901D 19.29,502,2,414,1/	CARD	89
901D 20.29,111,4,501,1/	CARD	90
901D 21.79,501,2,416,1/	CARD	91
1101D 501,1.0E4,1.0,1,-999,6.0E6,10.0,0.1E6,15.0/	CARD	92
1101D 502,1.0E4,1.0,1,-999,6.0E6,10.0,0.1E6,15.0/	CARD	93
1601D 601,1,0.95,1272.61,5.2E6,3.892E6,544.5,1800.0,8.0,20.0/	CARD	94
2101D 501,0.0,1.0E-5/	CARD	95
2101D 502,0.0,1.0E-5/	CARD	96
2401D 411,0,1,2.7872E6,424.202,5.447E6/	CARD	97
2401D 413,0,1,2.7872E6,848.404,5.447E6/	CARD	98
2401D 412,1,1,1.89E6,1272.61,3.892E6/	CARD	99
2401D 414,1,3,0.9975,0.001,4.892E6/	CARD	100
2401D 416,1,3,0.99075,0.001,5.0E6/	CARD	101
2501D 111,0.0,0.0,5.44E6/	CARD	102
2501D,112,0.0,0.0,5.21E6/	CARD	103
2511D 111,2,1272.61/	CARD	104
2511D 111,4,0.001/	CARD	105
2511D,112,3,1272.61/	CARD	106
2511D 112,2,0.001/	CARD	107
2601D 601,1800.0,-113.0E7/	CARD	108
3011D 22, 0.0,0.0, 999.0,0.0/	CARD	109
3121D 501, 0.0,1.0E-5, 999.0,1.0E-5/	CARD	110
3121D 502, 0.0,1.0E-5, 999.0,1.0E-5/	CARD	111
3411D 411,1,1, 0.0,2.7872E6,424.202, 999.0,2.7872E6,424.202/	CARD	112
3411D 413,1,1, 0.0,2.7872E6,848.404, 999.0,2.7872E6,848.404/	CARD	113
3411D 412,2,1, 0.0,1.89E6,3.892E6, 999.0,1.89E6,3.892E6/	CARD	114
3411D 414,2,3, 0.0,0.9975,4.892E6, 999.0,0.9975,4.892E6/	CARD	115
3411D 416,2,3, 0.0,0.99075,5.0E6, 999.0,0.99075,5.0E6/	CARD	116

3601D 601,999.0/	CARD 117
3611D 601, 0.0,1800.0, 999.0,1800.0/	CARD 118
4000D 25.0/	CARD 119
4100D 99999,3,1.0,999.0/	CARD 120
4200D 0,50/	CARD 121
4300D 1/	CARD 122
/	CARD 123

***CARD INPUT USED TO CREATE VERSION 0 OF FILE LINK ***

10000D 1 1 902 413 0 0	CARD 125
10000D 2 2 0 0 800 404	CARD 126
10000D 3 1 901 411 0 0	CARD 127
10000D 4 2 0 0 700 402	CARD 128

BEGIN SYSTEM PARSE,

MODULE 413 IS A BOUNDARY

RECORD	401	MODID	-	413	CARD	64
		OUTLETID	-	1		
RECORD	2401	MODID	-	413	CARD	98
		K3EBST	-	0		
		K3EBC	-	1		
		E3BC	J/KG,K	2.7872E+06		
		W3BC	KG/S	8.4840E+02		
		P3BC	PA	5.4470E+06		
RECORD	3411	MODID	-	413	CARD	113
		I3BCTP	-	1		
		K3ETAB	-	1		
		S3TAB	S	0.0000E+00		
		E3TAB	J/KG,K	2.7872E+06		
		P3WTAB	KG/S, PA	8.4840E+02		

MODULE 23 IS A PIPE

RECORD	1	MODID	-	23	CARD	60
		INLETID	-	1		
		OUTLETID	-	2		
		X3MOD	M	1.0000E-01		
		Y3ID	M	6.0500E-01		
		E3PSI	-	1.5000E-05		
		N3NODE	-	1		
		N3PATH	-	2		

MODULE 111 IS A VOLUME

RECORD	501	MODID	-	111	CARD	68
		L3VSHP	-	2		
		V3VOL	M**3	3.5340E+01		
		Y3VOL	M	3.0000E+00		
		F3VMIN	-	0.0000E+00		
		F3VMAX	-	1.0000E+00		
		Z3VOL	M	1.9790E+01		
		N3PATH	-	1		
		L3PSEP	-	1		
RECORD	511	MODID	-	111	CARD	72
		INLETID	-	3		
RECORD	512	MODID	-	111	CARD	73
		OUTLETID	-	4		

	RECORD	2501	MODID	-	111	CARD	102
			Q3MOD	J/S	0.0000E+00		
			F3LQLV	-	0.0000E+00		
			P3VOL	PA	5.4400E+06		
MODULE	22 IS A PIPE						
	RECORD	1	MODID	-	22	CARD	59
			INLETID	-	1		
			OUTLETID	-	2		
			X3MOD	M	2.7627E+01		
			Y3ID	M	6.8000E-01		
			E3PSI	-	1.5000E-05		
			N3NODE	-	3		
			N3PATH	-	3		
	RECORD	3011	MODID	-	22	CARD	109
			S3QT	S	0.0000E+00		
			Q3MDT	J/S	0.0000E+00		
MODULE	112 IS A VOLUME						
	RECORD	501	MODID	-	112	CARD	69
			L3VSH	-	2		
			V3VOL	M**3	3.5340E+01		
			Y3VOL	M	3.0000E+00		
			F3VMIN	-	0.0000E+00		
			F3VMAX	-	1.0000E+00		
			Z3VOL	M	1.9790E+01		
			N3PATH	-	1		
			L3PSEP	-	1		
	RECORD	511	MODID	-	112	CARD	74
			INLETID	-	1		
	RECORD	512	MODID	-	112	CARD	76
			OUTLETID	-	3		
	RECORD	2501	MODID	-	112	CARD	103
			Q3MOD	J/S	0.0000E+00		
			F3LQLV	-	0.0000E+00		
			P3VOL	PA	5.2100E+06		
MODULE	601 IS A TURBINE						
	RECORD	2601	MODID	-	601	CARD	108
			R3TS	RPM	1.8000E+03		
			Q3MOD	J/S	-1.1300E+09		
	RECORD	601	MODID	-	601	CARD	77
			INLETID	-	1		
			OUTLETID	-	2		
			ALFATS	DEG	1.5000E+01		

RECORD	1601	MODID	-	601	CARD	94
		I3TTYP	-	1		
		E3FGEN	-	9.5000E-01		
		W3TRF	KG/S	1.2726E+03		
		P3ITRF	PA	5.2000E+06		
		P3OTRF	PA	3.8920E+06		
		T3ITRF	K	5.4450E+02		
		R3TSRF	RPM	1.8000E+03		
		S3TTAU	S	8.0000E+00		
		S3TSEZ	S	2.0000E+01		
RECORD	3601	MODID	-	601	CARD	117
		S3TSTP	S	9.9900E+02		
RECORD	3611	MODID	-	601	CARD	118
		S3TSTB	S	0.0000E+00		
		R3TSTB	RPM	1.8000E+03		
MODULE	412 IS A BOUNDARY					
RECORD	402	MODID	-	412	CARD	65
		INLETID	-	1		
RECORD	2401	MODID	-	412	CARD	99
		K3EBST	-	1		
		K3EBC	-	1		
		E3BC	J/KG, K	1.8900E+06		
		W3BC	KG/S	1.2726E+03		
		P3BC	PA	3.8920E+06		
RECORD	3411	MODID	-	412	CARD	114
		I3BCTP	-	2		
		K3ETAB	-	1		
		S3TAB	S	0.0000E+00		
		E3TAB	J/KG, K	1.8900E+06		
		P3WTAB	KG/S, PA	3.8920E+06		
MODULE	502 IS A VALVE					
RECORD	101	MODID	-	502	CARD	62
		INLETID	-	1		
		OUTLETID	-	2		
		X3MOD	M	1.2000E+00		
		Y3ID	M	6.0500E-01		
		E3PSI	-	1.5000E-04		
		N3NODE	-	1		
		N3PATH	-	1		
		A3VMAX	M**2	2.8700E-01		
		S3VMIN	S	1.0000E-05		
		F3STOA	-	1.5000E+00		
RECORD	1101	MODID	-	502	CARD	93
		F3KMI	-	1.0000E+04		

F3VALV	-	1.0000E+00
I3CHOK	-	1
J3VPRS	-	-999
P3VOPN	PA, KG/S	6.0000E+06
S3VOPN	S	1.0000E+01
P3VCLO	PA, KG/S	1.0000E+05
S3VCLO	S	1.5000E+01

RECORD 2101	MODID	-	502	CARD	96
	Q3MOD	J/S	0.0000E+00		
	S3VPOS	-	1.0000E-05		

RECORD 3121	MODID	-	502	CARD	111
	S3VTIM	S	0.0000E+00		
	S3VPSN	-	1.0000E-05		

MODULE 414 IS A BOUNDARY

RECORD 402	MODID	-	414	CARD	66
	INLETID	-	1		

RECORD 2401	MODID	-	414	CARD	100
	K3EBST	-	1		
	K3EBC	-	3		
	E3BC	J/KG, K	9.9750E-01		
	W3BC	KG/S	1.0000E-03		
	P3BC	PA	4.8920E+06		

RECORD 3411	MODID	-	414	CARD	115
	I3BCTP	-	2		
	K3ETAB	-	3		
	S3TAB	S	0.0000E+00		
	E3TAB	J/KG, K	9.9750E-01		
	P3WTAB	KG/S, PA	4.8920E+06		

MODULE 501 IS A VALVE

RECORD 101	MODID	-	501	CARD	61
	INLETID	-	1		
	OUTLETID	-	2		
	X3MOD	M	1.2000E+00		
	Y3ID	M	6.0500E-01		
	E3PSI	-	1.5000E-04		
	N3NODE	-	1		
	N3PATH	-	1		
	A3VMAX	M**2	2.8700E-01		
	S3VMIN	S	1.0000E-05		
	F3STOA	-	1.5000E+00		

RECORD 1101	MODID	-	501	CARD	92
	F3KMI	-	1.0000E+04		
	F3VALV	-	1.0000E+00		
	I3CHOK	-	1		
	J3VPRS	-	-999		
	P3VOPN	PA, KG/S	6.0000E+06		

		S3VOPN	S	1.0000E+01		
		P3VCLO	PA, KG/S	1.0000E+05		
		S3VCLO	S	1.5000E+01		
RECORD	2101	MODID	-	501	CARD	95
		Q3MOD	J/S	0.0000E+00		
		S3VPOS	-	1.0000E-05		
RECORD	3121	MODID	-	501	CARD	110
		S3VTIM	S	0.0000E+00		
		S3VPSN	-	1.0000E-05		
MODULE	416 IS A BOUNDARY					
RECORD	402	MODID	-	416	CARD	67
		INLETID	-	1		
RECORD	2401	MODID	-	416	CARD	101
		K3EBST	-	1		
		K3EBC	-	3		
		E3BC	J/KG, K	9.9075E-01		
		W3BC	KG/S	1.0000E-03		
		P3BC	PA	5.0000E+06		
RECORD	3411	MODID	-	416	CARD	116
		I3BCTP	-	2		
		K3ETAB	-	3		
		S3TAB	S	0.0000E+00		
		E3TAB	J/KG, K	9.9075E-01		
		P3WTAB	KG/S, PA	5.0000E+06		
MODULE	411 IS A BOUNDARY					
RECORD	401	MODID	-	411	CARD	63
		OUTLETID	-	1		
RECORD	2401	MODID	-	411	CARD	97
		K3EBST	-	0		
		K3EBC	-	1		
		E3BC	J/KG, K	2.7872E+06		
		W3BC	KG/S	4.2420E+02		
		P3BC	PA	5.4470E+06		
RECORD	3411	MODID	-	411	CARD	112
		I3BCTP	-	1		
		K3ETAB	-	1		
		S3TAB	S	0.0000E+00		
		E3TAB	J/KG, K	2.7872E+06		
		P3WTAB	KG/S, PA	4.2420E+02		
MODULE	21 IS A PIPE					
RECORD	1	MODID	-	21	CARD	58
		INLETID	-	1		

OUTLETID	-	2
X3MOD	M	1.0000E-01
Y3ID	M	6.0500E-01
E3PSI	-	1.5000E-05
N3NODE	-	1
N3PATH	-	1

MODULE 403 IS A BOUNDARY

RECORD	401	MODID	-	403	CARD	12
		OUTLETID	-	1		
RECORD	2401	MODID	-	403	CARD	43
		K3EBST	-	0		
		K3EBC	-	1		
		E3BC	J/KG, K	2.7400E+06		
		W3BC	KG/S	1.8193E+02		
		P3BC	PA	4.2000E+06		
RECORD	3411	MODID	-	403	CARD	53
		I3BCTP	-	1		
		K3ETAB	-	1		
		S3TAB	S	0.0000E+00		
		E3TAB	J/KG, K	2.7400E+06		
		P3WTAB	KG/S, PA	1.8193E+02		

MODULE 301 IS A HEAT EXCHANGER

RECORD	301	MODID	-	301	CARD	8
		INLETID	-	1		
		OUTLETID	-	2		
		X3MOD	M	1.2670E+01		
		Y3ID	M	1.4400E-02		
		E3PSI	-	4.5000E-06		
		N3NODE	-	1		
		N3PATH	-	1		
		INLETID	-	3		
		OUTLETID	-	4		
		Y3OD	M	1.5875E-02		
		F3TBPD	-	2.0137E+00		
		N3TUBE	-	2100		
		M3TYPE	-	1		
		I3GRID	-	6		
		D3COIL	M	0.0000E+00		
		F3IT00	-	1.0000E+00		
		Y3CORO	M	0.0000E+00		
		M3CORE	-	1		
		M3STRC	-	1		
		A3STRC	M**2	9.4100E+02		
		B3STRC	KG	1.8400E+04		
RECORD	1301	MODID	-	301	CARD	39
		F3KMI	-	5.0000E-01		
		F3KMO	-	5.0000E-01		
		I3LVTI	-	3		
		I3LVTO	-	3		
		F3CCFL	-	-1.0000E+00		

	RECORD	2301	MODID	-	301	CARD	41
			Q3MOD	J/S	2.0720E+08		
MODULE	406 IS A BOUNDARY						
	RECORD	402	MODID	-	406	CARD	14
			INLETID	-	1		
	RECORD	2401	MODID	-	406	CARD	46
			K3EBST	-	1		
			K3EBC	-	1		
			E3BC	J/KG,K	1.6000E+06		
			W3BC	KG/S	1.8193E+02		
			P3BC	PA	4.2000E+06		
	RECORD	3411	MODID	-	406	CARD	54
			I3BCTP	-	2		
			K3ETAB	-	1		
			S3TAB	S	0.0000E+00		
			E3TAB	J/KG,K	1.6000E+06		
			P3WTAB	KG/S,PA	4.2000E+06		
MODULE	401 IS A BOUNDARY						
	RECORD	401	MODID	-	401	CARD	10
			OUTLETID	-	1		
	RECORD	2401	MODID	-	401	CARD	42
			K3EBST	-	0		
			K3EBC	-	1		
			E3BC	J/KG,K	8.0847E+05		
			W3BC	KG/S	1.2726E+03		
			P3BC	PA	1.0000E+03		
	RECORD	3411	MODID	-	401	CARD	52
			I3BCTP	-	1		
			K3ETAB	-	1		
			S3TAB	S	0.0000E+00		
			E3TAB	J/KG,K	8.0847E+05		
			P3WTAB	KG/S,PA	1.2726E+03		
MODULE	1 IS A PIPE						
	RECORD	1	MODID	-	1	CARD	2
			INLETID	-	1		
			OUTLETID	-	2		
			X3MOD	M	5.0000E-01		
			Y3ID	M	4.4300E-01		
			E3PSI	-	1.5000E-05		
			N3NODE	-	1		
			N3PATH	-	1		
MODULE	201 IS A PUMP						

RECORD	201	MODID	-	201	CARD	7
		INLETID	-	1		
		OUTLETID	-	2		
		X3MOD	M	3.1860E+00		
		Y3ID	M	3.5300E-01		
		E3PSI	-	1.5000E-06		
		N3NODE	-	1		
		N3PATH	-	2		

RECORD	1201	MODID	-	201	CARD	37
		F3KMI	-	0.0000E+00		
		W3REF	KG/S	7.0406E+02		
		H3REF	M	5.0749E+02		
		F3REF	RPM	3.5700E+03		
		A3PUMP	-	1.2772E+00		
				-6.3970E-01		
				1.2513E+00		
				-1.1053E+00		
				2.1670E-01		
		S3PTAU	S	5.0000E+00		
		S3PSEZ	S	2.0000E+01		

RECORD	2201	MODID	-	201	CARD	40
		Q3MOD	J/S	0.0000E+00		
		F3PUMP	RPM	3.5700E+03		

RECORD	3201	MODID	-	201	CARD	50
		S3PTRP	S	9.9999E+03		

RECORD	3221	MODID	-	201	CARD	51
		S3PTIM	S	0.0000E+00		
		R3PMPT	RPM	3.5700E+03		

MODULE 2 IS A PIPE

RECORD	1	MODID	-	2	CARD	3
		INLETID	-	1		
		OUTLETID	-	2		
		X3MOD	M	1.0800E+01		
		Y3ID	M	4.4300E-01		
		E3PSI	-	1.5000E-05		
		N3NODE	-	1		
		N3PATH	-	1		

RECORD	1001	MODID	-	2	CARD	33
		F3KMI	-	9.3700E+00		

MODULE 3 IS A PIPE

RECORD	1	MODID	-	3	CARD	4
		INLETID	-	1		
		OUTLETID	-	2		
		X3MOD	M	2.2150E+01		
		Y3ID	M	4.4300E-01		
		E3PSI	-	1.5000E-05		

		N3NODE	-	2		
		N3PATH	-	1		
	RECORD 1001	MODID	-	3		CARD 34
		F3KMI	-	1.0310E+01		
MODULE	101 IS A VOLUME					
	RECORD 501	MODID	-	101		CARD 15
		L3VSH	-	2		
		V3VOL	M**3	3.5340E+01		
		Y3VOL	M	3.0000E+00		
		F3VMIN	-	0.0000E+00		
		F3VMAX	-	1.0000E+00		
		Z3VOL	M	3.1860E+00		
		N3PATH	-	1		
		L3PSEP	-	1		
	RECORD 511	MODID	-	101		CARD 16
		INLETID	-	1		
	RECORD 512	MODID	-	101		CARD 18
		OUTLETID	-	3		
	RECORD 2501	MODID	-	101		CARD 47
		Q3MOD	J/S	0.0000E+00		
		F3LQLV	-	0.0000E+00		
		P3VOL	PA	7.1120E+06		
MODULE	5 IS A PIPE					
	RECORD 1	MODID	-	5		CARD 6
		INLETID	-	1		
		OUTLETID	-	2		
		X3MOD	M	5.0529E+01		
		Y3ID	M	3.5300E-01		
		E3PSI	-	1.5000E-05		
		N3NODE	-	3		
		N3PATH	-	1		
	RECORD 1001	MODID	-	5		CARD 36
		F3KMI	-	1.0310E+01		
MODULE	402 IS A BOUNDARY					
	RECORD 402	MODID	-	402		CARD 11
		INLETID	-	1		
	RECORD 2401	MODID	-	402		CARD 44
		K3EBST	-	1		
		K3EBC	-	1		
		E3BC	J/KG,K	9.7126E+05		
		W3BC	KG/S	4.2420E+02		
		P3BC	PA	5.7725E+06		

	RECORD	3411	MODID	-	402	CARD	55
			I3BCTP	-	2		
			K3ETAB	-	1		
			S3TAB	S	0.0000E+00		
			E3TAB	J/KG, K	9.7126E+05		
			P3WTAB	KG/S, PA	5.7725E+06		
MODULE		4 IS A PIPE					
	RECORD	1	MODID	-	4	CARD	5
			INLETID	-	1		
			OUTLETID	-	2		
			X3MOD	M	5.0529E+01		
			Y3ID	M	3.5300E-01		
			E3PSI	-	1.5000E-05		
			N3NODE	-	3		
			N3PATH	-	2		
	RECORD	1001	MODID	-	4	CARD	35
			F3KMI	-	1.0310E+01		
MODULE		404 IS A BOUNDARY					
	RECORD	402	MODID	-	404	CARD	13
			INLETID	-	1		
	RECORD	2401	MODID	-	404	CARD	45
			K3EBST	-	1		
			K3EBC	-	1		
			E3BC	J/KG, K	9.7126E+05		
			W3BC	KG/S	8.2840E+02		
			P3BC	PA	5.7725E+06		
	RECORD	3411	MODID	-	404	CARD	56
			I3BCTP	-	2		
			K3ETAB	-	1		
			S3TAB	S	0.0000E+00		
			E3TAB	J/KG, K	9.7126E+05		
			P3WTAB	KG/S, PA	5.7725E+06		

MINET External Linkage Verification

RECORD 10000	MODID	-	4	CARD	128
	LNK	-	2		
	NTD	-	0		
	MTD	-	0		
	NFIL	-	700		
	MFIL	-	402		
RECORD 10000	MODID	-	3	CARD	127
	LNK	-	1		
	NTD	-	901		
	MTD	-	411		
	NFIL	-	0		
	MFIL	-	0		
RECORD 10000	MODID	-	2	CARD	126
	LNK	-	2		
	NTD	-	0		
	MTD	-	0		
	NFIL	-	800		
	MFIL	-	404		
RECORD 10000	MODID	-	1	CARD	125
	LNK	-	1		
	NTD	-	902		
	MTD	-	413		
	NFIL	-	0		
	MFIL	-	0		

RETRAN CODE PACKAGE RESOURCE ALLOCATION STATISTICS.

CODING SPACE ALLOCATION FILE ID = -1.
BEGINING ADDRESS OF CM CODING = 512638
BEGINING INDEX OF CM CODING = 00FAA3
SPACE ALLOCATED FOR CM CODING = 0031EA
BEGINING ADDRESS OF CM STORAGE = 52B588
BEGINING INDEX OF CM STORAGE = 012C8D
LENGTH OF CM STORAGE = 092420
BEGINING ADDRESS OF ECS STORAGE = 000000
BEGINING INDEX OF ECS STORAGE = 000000
LENGTH OF ECS STORAGE = 000000

USING THE RETRAN ENVIRONMENTAL LIBRARY IBM/MOD32 AS RELEASED BY EPRI

RETRAN PROBLEM CONTROL AND DESCRIPTION DATA.

TAPE	NUM	NUM	NUM	NUM	NUM	NUM	NUM	NUM	NUM	NUM	NUM	NUM	NUM	NUM	NUM	NUM	T S	M-W	
DUMP	EDIT	TIME	TRIP	VOL	BUB	TDV	JUN	PUMP	VALV	AREA	FILL	HEAT	COND	COND	CORE	HEAT	MMIX	POWR	REAC
0=NO	VAR	SETS	SGNL	SETS	CRDS			SETS	SETS	CURV	CURV	COND	GEOM	MAT	SECT	EXCH	OPTN	OPTN	OPTN
-1	51	1	45	50	8	3	75	2	3	6	22	35	9	6	3	0	0	0	0

NUM	NUM	NUM	S	ST	TRNS	HTCH	FDBK	HEAT	ITER	NUM	NUM	NEUT	NUM	FLOW	NEW	NUM	
LIQL	TDV	SLIP	CDHT	BYPS	PRZR	DELY	DNBR	CNTL	TRAN	EXPL	COND	TURB	VOID	VOID	MODE	EQU	SEPR
VOLS	TAPE	OPTN	COEF	OPTN	OPTN	OPTN	OPTN	OPTN	OPTN	STAK	SFTS	OPTN	SETS	OPTN	OPTN	VOLS	
0	0	1	0	0	1	0	0	1	1	-1	4	0	0	0	0	0	

A RETRAN DATA TAPE WILL BE GENERATED WITH A LABEL OF RETRAN1

VSN = DENSITY = PE

INITIAL THERMAL POWER (MEGAWATTS) = 2.30000E+03

DATA FOR 1 TIME STEP SETS.

SET	T S	MIN	MAJ	T S	MAXIMUM	MINIMUM	END	ITERATIVE	ITERATIVE	ITERATIVE	ONE DIM
NUM	PER	PER	PER	CNT	TIME STEP	TIME STEP	OF	PRESSURE	SOLUTION	COURANT	KINETICS
	MIN	MAJ	TED	OPT	SIZE	SIZE	INTERVAL	CONVERGENCE	CONVERGENCE	COEFFICIENT	(NSHAP)
1	1	1	1	0	1.00000E+00	1.00000E-03	5.00000E+01	1.00000E+10	1.00000E+10	3.00000E-01	0

GENERALIZED TRIP PARAMETERS FOR 45 SIGNALS.

TRIP NO.	TRIP ID	SIG ID	INDX 1	INDX 2	ACTION	TRIP SIGNAL	SET POINT	DELAY TIME
1	1	1	0	0	END PROB	ELAPSED TIME	2.500000E+01	0.000000E+00
2	2	-4	39	0	GEN TRIP	LOW PRESSURE	1.730000E+03	5.000000E+00
3	3	1	0	0	GEN TRIP	ELAPSED TIME	0.000000E+00	0.000000E+00
4	4	1	0	0	GEN TRIP	ELAPSED TIME	0.000000E+00	0.000000E+00
5	5	4	132	0	GEN TRIP	HIGH PRESSUR	1.089000E+03	0.000000E+00
6	-5	-4	132	0	RST TRIP	LOW PRESSURE	1.045000E+03	0.000000E+00
7	6	4	132	0	GEN TRIP	HIGH PRESSUR	1.114000E+03	0.000000E+00
8	-6	-4	132	0	RST TRIP	LOW PRESSURE	1.069000E+03	0.000000E+00
9	7	4	132	0	GEN TRIP	HIGH PRESSUR	1.128000E+03	0.000000E+00
10	-7	-4	132	0	RST TRIP	LOW PRESSURE	1.083000E+03	0.000000E+00
11	8	4	132	0	GEN TRIP	HIGH PRESSUR	1.143000E+03	0.000000E+00
12	-8	-4	132	0	RST TRIP	LOW PRESSURE	1.097000E+03	0.000000E+00
13	9	1	0	0	GEN TRIP	ELAPSED TIME	0.000000E+00	0.000000E+00
14	10	1	0	0	GEN TRIP	ELAPSED TIME	0.000000E+00	0.000000E+00
15	11	4	232	0	GEN TRIP	HIGH PRESSUR	1.089000E+03	0.000000E+00
16	-11	-4	232	0	RST TRIP	LOW PRESSURE	1.045000E+03	0.000000E+00
17	12	4	232	0	GEN TRIP	HIGH PRESSUR	1.114000E+03	0.000000E+00
18	-12	-4	232	0	RST TRIP	LOW PRESSURE	1.069000E+03	0.000000E+00
19	13	4	232	0	GEN TRIP	HIGH PRESSUR	1.128000E+03	0.000000E+00
20	-13	-4	232	0	RST TRIP	LOW PRESSURE	1.083000E+03	0.000000E+00
21	14	4	232	0	GEN TRIP	HIGH PRESSUR	1.143000E+03	0.000000E+00
22	-14	-4	232	0	RST TRIP	LOW PRESSURE	1.097000E+03	0.000000E+00
23	15	1	0	0	GEN TRIP	ELAPSED TIME	1.000000E-02	5.000000E+00
24	16	-4	39	0	GEN TRIP	LOW PRESSURE	1.859000E+03	1.000000E+00
25	-3	12	16	0	RST TRIP	INDIRECT TRP	0.000000E+00	2.000000E+00
26	-4	12	16	0	RST TRIP	INDIRECT TRP	0.000000E+00	2.000000E+00
27	-9	12	16	0	RST TRIP	INDIRECT TRP	0.000000E+00	2.000000E+00
28	-10	12	16	0	RST TRIP	INDIRECT TRP	0.000000E+00	2.000000E+00
29	17	-5	101	0	GEN TRIP	LOW MIX LEV	3.393000E+01	0.000000E+00
30	18	-5	201	0	GEN TRIP	LOW MIX LEV	3.393000E+01	0.000000E+00
31	19	13	17	16	GEN TRIP	COINCID TRIP	0.000000E+00	2.000000E+00
32	20	13	18	16	GEN TRIP	COINCID TRIP	0.000000E+00	2.000000E+00
33	-19	6	101	0	RST TRIP	HIGH LIQ LEV	4.108000E+01	0.000000E+00
34	-20	6	201	0	RST TRIP	HIGH LIQ LEV	4.108000E+01	0.000000E+00
35	21	-4	13	0	GEN TRIP	LOW PRESSURE	6.147000E+02	0.000000E+00
36	-21	-6	500	0	RST TRIP	LOW LIQ LEV	2.500000E-01	0.000000E+00
37	-21	-9	500	0	RST TRIP	LOW FLOW	-1.000000E-03	0.000000E+00
38	22	-4	34	0	GEN TRIP	LOW PRESSURE	6.147000E+02	0.000000E+00
39	-22	-6	501	0	RST TRIP	LOW LIQ LEV	2.500000E-01	0.000000E+00
40	-22	-9	501	0	RST TRIP	LOW FLOW	-1.000000E-03	0.000000E+00
41	23	1	0	0	GEN TRIP	ELAPSED TIME	5.000000E+03	0.000000E+00
42	24	1	0	0	GEN TRIP	ELAPSED TIME	5.000000E+03	0.000000E+00

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43	30	14	-25	0	GEN TRIP HIGH OUTPUT	0.000000E+00	0.000000E+00
44	30	14	-26	0	GEN TRIP HIGH OUTPUT	0.000000E+00	0.000000E+00
45	30	12	16	0	GEN TRIP INDIRECT TRP	0.000000E+00	0.000000E+00

CONTROL SYSTEM DESCRIPTION -- INPUT DATA

NUMBER OF INPUTS (NCI) IS 13 NUMBER OF BLOCKS (NCB) IS 26 MAX CONTROL SYSTEM TIME STEP (DTCMAX) IS5.00E-02

BLOCK/ SIGNAL ID	BLOCK/ SIGNAL TYPE	INPUT 1	INPUT 2	GAIN	PARAMETER	PARAMETER	INITIAL OUTPUT	MIN OUTPUT	MAX OUTPUT
1	TEMP	2		1.0000					
2	TEMP	13		1.0000					
3	WP**	94		1.0000					
4	WP**	95		1.0000					
5	TEMP	23		1.0000					
6	TEMP	34		1.0000					
7	TRIP	19		1.0000					
8	TRIP	20		1.0000					
9	CONS	0		547.20					
10	PRES	39		1.0000					
11	CONS	0		2250.0					
12	CONS	0		1.1620					
13	CONS	0		575.46					
-1	SUM	1	2	1.0000	0.50000	0.50000	575.50	-1.00000E+75	1.00000E+75
-2	SUM	3	4	1.0000	1.0000	1.0000	0.00000E+00	-1.00000E+75	1.00000E+75
-3	INT	-2	0	1.0000	0.00000E+00	0.00000E+00	0.00000E+00	-1.00000E+75	1.00000E+75
-4	SUM	5	6	1.0000	0.50000	0.50000	575.50	-1.00000E+75	1.00000E+75
-5	LLG	-4	0	1.0000	25.000	5.0000	0.00000E+00	-1.00000E+75	1.00000E+75
-6	LLG	-1	0	1.0000	25.000	5.0000	0.00000E+00	-1.00000E+75	1.00000E+75
-7	SUM	-5	9	1.0000	1.0000	-1.0000	28.500	-1.00000E+75	1.00000E+75
-8	SUM	-6	9	1.0000	1.0000	-1.0000	28.500	-1.00000E+75	1.00000E+75
-9	LAG	7	0	1.0000	0.50000	0.00000E+00	0.00000E+00	0.00000E+00	1.0000
-10	LAG	8	0	1.0000	0.50000	0.00000E+00	0.00000E+00	0.00000E+00	1.0000
-11	MUL	-9	-7	1.0000	0.00000E+00	0.00000E+00	0.00000E+00	-1.00000E+75	1.00000E+75
-12	MUL	-10	-8	1.0000	0.00000E+00	0.00000E+00	0.00000E+00	-1.00000E+75	1.00000E+75
-13	FNG	-11	3	1.0000	0.00000E+00	0.00000E+00	0.00000E+00	-476.01	0.00000E+00
-14	FNG	-12	4	1.0000	0.00000E+00	0.00000E+00	0.00000E+00	-476.01	0.00000E+00
-15	SUM	1	2	1.0000	1.0000	-1.0000	57.500	-1.00000E+75	1.00000E+75
-16	SUM	5	6	1.0000	1.0000	-1.0000	57.500	-1.00000E+75	1.00000E+75
-17	SUM	10	11	7.97800E-04	1.0000	-1.0000	0.00000E+00	-1.00000E+75	1.00000E+75
-18	SUM	-1	13	1.0000	1.0000	-1.0000	0.00000E+00	-1.00000E+75	1.00000E+75
-19	SUM	-4	13	1.0000	1.0000	-1.0000	0.00000E+00	-1.00000E+75	1.00000E+75
-20	SUM	12	-17	1.0000	1.0000	1.0000	1.1620	-1.00000E+75	1.00000E+75
-21	LLG	-18	0	1.03500E-02	0.20700	3.0000	0.00000E+00	-1.00000E+75	1.00000E+75
-22	LLG	-19	0	1.03500E-02	0.20700	3.0000	0.00000E+00	-1.00000E+75	1.00000E+75
-23	SUM	-20	-21	57.500	1.0000	-1.0000	66.800	-1.00000E+75	1.00000E+75
-24	SUM	-20	-22	57.500	1.0000	-1.0000	66.800	-1.00000E+75	1.00000E+75
-25	SUM	-15	-23	1.0000	1.0000	-1.0000	-9.3000	-1.00000E+75	1.00000E+75
-26	SUM	-16	-24	1.0000	1.0000	-1.0000	-9.3000	-1.00000E+75	1.00000E+75

NUMBER OF AUXILIARY STORAGE LOCATIONS REQUIRED IS 6

TIME DEPENDENT TABLES FOR 3 VOLUMES.

SET NUM	NUM PTS	TIME (SECONDS)	PRESSURE (PSIA)	TEMPERATURE (DEG F)	AVG. VOL. QUALITY	MIXTURE LEVEL (FEET)
1	2	0.000000E+00	0.147000E+02	0.300000E+03	0.000000E+00	0.191000E+03
		0.900000E+04	0.147000E+02	0.300000E+03	0.000000E+00	0.191000E+03
2	2	0.000000E+00	0.790000E+03	0.518220E+03	0.000000E+00	0.136300E+02
		0.999900E+04	0.790000E+03	0.518220E+03	0.000000E+00	0.136300E+02
3	2	0.000000E+00	0.790000E+03	0.518220E+03	0.000000E+00	0.136300E+02
		0.999900E+04	0.790000E+03	0.518220E+03	0.000000E+00	0.136300E+02

DESCRIPTIONS OF 50 VOLUMES. (NOT NECESSARILY IN ORDER OF DATA ON VOLUME CARDS)

VOL NUM	BUBL INDX	TIME DEP	PRESSURE (PSIA)	ENTHALPY (BTU/LBM)	HUMIDITY OR QUAL.	VOLUME (FT**3)	HEIGHT (FT)	MIXTURE LEVEL (FT)	FLOW LENGTH (FT)	FLOW AREA (FT**2)
NON EQIL	MESH INTR		HYDRAULIC DIAMETER(FT)	ELEVATION (FT)	RAIN OUT VEL. (FT/SEC)	INTER REGION HTC(B/H-F2)				
1	0	0	0.000000E+00	0.000000E+00	0.000000E+00	9.440000E+02	1.167000E+01	1.167000E+01	1.156863E+01	8.160000E+01
	0	0	1.400000E+00	-4.800000E+00	0.000000E+00	0.000000E+00				
2	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.910000E+02	3.590000E+00	3.590000E+00	2.080610E+01	9.180000E+00
	0	0	2.416700E+00	-1.210000E+00	0.000000E+00	0.000000E+00				
3	0	0	0.000000E+00	0.000000E+00	0.000000E+00	2.687000E+02	5.910000E+00	5.910000E+00	5.473000E+00	7.524000E+01
	0	0	5.940000E+00	7.900000E-01	0.000000E+00	0.000000E+00				
4	0	0	0.000000E+00	0.000000E+00	0.000000E+00	2.248000E+02	1.054000E+01	1.054000E+01	1.053421E+01	2.134000E+01
	0	0	6.460000E-02	6.700000E+00	0.000000E+00	0.000000E+00				
5	0	0	0.000000E+00	0.000000E+00	0.000000E+00	2.248000E+02	1.054000E+01	1.054000E+01	1.053421E+01	2.134000E+01
	0	0	6.460000E-02	1.724000E+01	0.000000E+00	0.000000E+00				
7	5	0	0.000000E+00	0.000000E+00	0.000000E+00	4.496000E+02	9.405000E+00	9.405000E+00	2.106842E+01	2.134000E+01
	0	0	6.460000E-02	2.771540E+01	0.000000E+00	0.000000E+00				
8	0	0	0.000000E+00	0.000000E+00	0.000000E+00	2.248000E+02	1.054000E+01	1.054000E+01	1.053421E+01	2.134000E+01
	0	0	6.460000E-02	1.724000E+01	0.000000E+00	0.000000E+00				
9	0	0	0.000000E+00	0.000000E+00	0.000000E+00	2.248000E+02	1.054000E+01	1.054000E+01	1.053421E+01	2.134000E+01
	0	0	6.460000E-02	6.700000E+00	0.000000E+00	0.000000E+00				
10	0	0	0.000000E+00	0.000000E+00	0.000000E+00	2.687000E+02	5.910000E+00	5.910000E+00	5.473000E+00	7.524000E+01
	0	0	5.940000E+00	7.900000E-01	0.000000E+00	0.000000E+00				
11	0	0	0.000000E+00	0.000000E+00	0.000000E+00	2.612000E+02	1.205000E+01	1.205000E+01	2.492366E+01	1.048000E+01
	0	0	2.583300E+00	-9.830000E+00	0.000000E+00	0.000000E+00				
12	0	0	0.000000E+00	0.000000E+00	0.000000E+00	3.840000E+02	5.190000E+00	5.190000E+00	2.000000E+01	1.920000E+01
	0	0	3.500000E+00	-4.040000E+00	0.000000E+00	0.000000E+00				
13	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.616000E+02	2.290000E+00	2.290000E+00	1.878000E+01	8.240000E+00
	0	0	2.291700E+00	-1.150000E+00	0.000000E+00	0.000000E+00				
14	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.840000E+02	8.630000E+00	8.630000E+00	8.630000E+00	1.544000E+01
	0	0	7.333000E-01	-2.670000E+00	0.000000E+00	0.000000E+00				
15	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.840000E+02	8.630000E+00	8.630000E+00	8.630000E+00	1.544000E+01
	0	0	7.333000E-01	-1.130000E+01	0.000000E+00	0.000000E+00				
16	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.840000E+02	8.630000E+00	8.630000E+00	8.630000E+00	1.544000E+01
	0	0	7.333000E-01	-1.992000E+01	0.000000E+00	0.000000E+00				
17	0	0	0.000000E+00	5.430000E+02	0.000000E+00	7.280000E+02	9.790000E+00	9.790000E+00	1.750000E+01	7.436000E+01
	0	0	6.800000E-01	-2.651000E+01	0.000000E+00	0.000000E+00				
18	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.657000E+02	4.020000E+00	4.020000E+00	4.000483E+00	4.142000E+01
	0	0	4.117000E-02	-1.672000E+01	0.000000E+00	0.000000E+00				
19	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.657000E+02	4.000000E+00	4.000000E+00	4.000483E+00	4.142000E+01
	0	0	4.117000E-02	-1.270000E+01	0.000000E+00	0.000000E+00				
20	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.657000E+02	4.100000E+00	4.100000E+00	4.000483E+00	4.142000E+01
	0	0	4.117000E-02	-8.700000E+00	0.000000E+00	0.000000E+00				
21	0	0	0.000000E+00	0.000000E+00	0.000000E+00	4.250000E+01	1.210000E+01	1.210000E+01	1.200000E+01	3.670000E+00
	0	0	2.400000E-02	-1.672000E+01	0.000000E+00	0.000000E+00				

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VOL NUM	BUBL INDX	TIME DEP	PRESSURE (PSIA)	ENTHALPY (BTU/LBM)	HUMIDITY OR QUAL.	VOLUME (FT**3)	HEIGHT (FT)	MIXTURE LEVEL (FT)	FLOW LENGTH (FT)	FLOW AREA (FT**2)
	NON EQIL	MESH INTR	HYDRAULIC DIAMETER(FT)	ELEVATION (FT)	RAIN OUT VEL.(FT/SEC)	INTER REGION HTC(B/H-F2)				
22	0	0	0.000000E+00	0.000000E+00	0.000000E+00	5.136000E+02	7.670000E+00	7.670000E+00	8.541493E+00	6.013000E+01
	0	0	2.930000E+00	5.960000E+00	0.000000E+00	0.000000E+00				
23	0	0	0.000000E+00	0.000000E+00	0.000000E+00	9.550000E+01	3.590000E+00	3.590000E+00	2.080610E+01	4.590000E+00
	0	0	2.416700E+00	-1.210000E+00	0.000000E+00	0.000000E+00				
24	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.344000E+02	5.910000E+00	5.910000E+00	5.473000E+00	3.762000E+01
	0	0	5.940000E+00	7.900000E-01	0.000000E+00	0.000000E+00				
25	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.124000E+02	1.054000E+01	1.054000E+01	1.053421E+01	1.067000E+01
	0	0	6.460000E-02	6.700000E+00	0.000000E+00	0.000000E+00				
26	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.124000E+02	1.054000E+01	1.054000E+01	1.053421E+01	1.067000E+01
	0	0	6.460000E-02	1.724000E+01	0.000000E+00	0.000000E+00				
28	8	0	0.000000E+00	0.000000E+00	0.000000E+00	2.248000E+02	9.405000E+00	9.405000E+00	2.106842E+01	1.067000E+01
	0	0	6.460000E-02	2.771540E+01	0.000000E+00	0.000000E+00				
29	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.124000E+02	1.054000E+01	1.054000E+01	1.053421E+01	1.067000E+01
	0	0	6.460000E-02	1.724000E+01	0.000000E+00	0.000000E+00				
30	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.124000E+02	1.054000E+01	1.054000E+01	1.053421E+01	1.067000E+01
	0	0	6.460000E-02	6.700000E+00	0.000000E+00	0.000000E+00				
31	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.344000E+02	5.910000E+00	5.910000E+00	5.473000E+00	3.762000E+01
	0	0	5.940000E+00	7.900000E-01	0.000000E+00	0.000000E+00				
32	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.306000E+02	1.205000E+01	1.205000E+01	2.492366E+01	5.240000E+00
	0	0	2.583300E+00	-9.830000E+00	0.000000E+00	0.000000E+00				
33	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.920000E+02	5.190000E+00	5.190000E+00	2.000000E+01	9.600000E+00
	0	0	3.500000E+00	-4.040000E+00	0.000000E+00	0.000000E+00				
34	0	0	0.000000E+00	0.000000E+00	0.000000E+00	8.080000E+01	2.290000E+00	2.290000E+00	1.878000E+01	4.120000E+00
	0	0	2.291700E+00	-1.150000E+00	0.000000E+00	0.000000E+00				
35	0	0	0.000000E+00	0.000000E+00	0.000000E+00	9.190000E+01	8.630000E+00	8.630000E+00	8.630000E+00	7.720000E+00
	0	0	7.333000E-01	-2.670000E+00	0.000000E+00	0.000000E+00				
36	0	0	0.000000E+00	0.000000E+00	0.000000E+00	9.190000E+01	8.630000E+00	8.630000E+00	8.630000E+00	7.720000E+00
	0	0	7.333000E-01	-1.130000E+01	0.000000E+00	0.000000E+00				
37	0	0	0.000000E+00	0.000000E+00	0.000000E+00	9.190000E+01	8.620000E+00	8.620000E+00	8.630000E+00	7.720000E+00
	0	0	7.333000E-01	-1.992000E+01	0.000000E+00	0.000000E+00				
39	2	0	2.250000E+03	0.000000E+00	-1.000000E+00	1.300000E+03	3.640000E+01	2.184000E+01	3.408495E+01	3.814000E+01
	1	0	6.969000E+00	9.030000E+00	4.000000E+00	0.000000E+00				
40	0	0	0.000000E+00	0.000000E+00	0.000000E+00	3.520000E+01	9.230000E+00	9.230000E+00	5.866667E+01	6.000000E-01
	0	0	8.750000E-01	0.000000E+00	0.000000E+00	0.000000E+00				
101	3	0	0.000000E+00	5.472700E+02	-1.000000E+00	4.729000E+03	5.353000E+01	3.825000E+01	1.811000E+01	8.834000E+01
	0	0	4.290000E+00	8.530000E+00	0.000000E+00	0.000000E+00				
131	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.360000E+02	3.242000E+01	3.242000E+01	4.290221E+01	3.170000E+00
	0	0	2.007500E+00	3.640000E+01	0.000000E+00	0.000000E+00				
132	0	0	8.040000E+02	0.000000E+00	0.000000E+00	4.565000E+02	1.363000E+01	1.363000E+01	1.440063E+02	3.170000E+00
	0	0	2.007500E+00	2.277000E+01	0.000000E+00	0.000000E+00				

VOL NUM	BUBL INDX	TIME DEP	PRESSURE (PSIA)	ENTHALPY (BTU/LBM)	HUMIDITY OR QUAL.	VOLUME (FT**3)	HEIGHT (FT)	MIXTURE LEVEL (FT)	FLOW LENGTH (FT)	FLOW AREA (FT**2)
NON EQIL	MESH INTR		HYDRAULIC DIAMETER(FT)	ELEVATION (FT)	RAIN OUT VEL. (FT/SEC)	INTER REGION HTC(B/H-F2)				
201	4	0	0.000000E+00	5.472700E+02	-1.000000E+00	9.458000E+03	5.353000E+01	3.825000E+01	1.811000E+01	1.766800E+02
	0	0	4.290000E+00	8.530000E+00	0.000000E+00	0.000000E+00				
231	0	0	0.000000E+00	0.000000E+00	0.000000E+00	2.720000E+02	3.242000E+01	3.242000E+01	4.290221E+01	6.340000E+00
	0	0	2.007500E+00	3.640000E+01	0.000000E+00	0.000000E+00				
232	0	0	8.040000E+02	0.000000E+00	0.000000E+00	8.700000E+02	1.363000E+01	1.363000E+01	1.372240E+02	6.340000E+00
	0	0	2.007500E+00	2.277000E+01	0.000000E+00	0.000000E+00				
500	6	0	6.147000E+02	4.800584E+01	1.000000E+00	2.513800E+03	1.734000E+01	1.239000E+01	1.734000E+01	1.450000E+02
	0	0	9.610000E+00	-7.800000E-02	0.000000E+00	0.000000E+00				
501	7	0	6.147000E+02	4.800584E+01	1.000000E+00	1.256900E+03	1.734000E+01	1.239000E+01	1.734000E+01	7.249000E+01
	0	0	9.610000E+00	-7.800000E-02	0.000000E+00	0.000000E+00				
701	0	0	0.000000E+00	0.000000E+00	0.000000E+00	1.164000E+02	2.000000E+00	2.000000E+00	1.104993E+02	1.053400E+00
	0	0	1.158115E+00	8.530000E+00	0.000000E+00	0.000000E+00				
801	0	0	0.000000E+00	0.000000E+00	0.000000E+00	2.328000E+02	2.000000E+00	2.000000E+00	1.104993E+02	2.106800E+00
	0	0	1.158000E+00	8.530000E+00	0.000000E+00	0.000000E+00				
900	0	1	1.470000E+01	1.898841E+02	1.000000E-02	1.950000E+06	1.910000E+02	1.910000E+02	1.500000E+02	1.300000E+04
	0	0	1.300000E+02	-1.420000E+01	0.000000E+00	0.000000E+00				
901	0	2	7.900000E+02	0.000000E+00	0.000000E+00	1.014000E+00	1.363000E+01	1.363000E+01	3.281553E-01	3.090000E+00
	0	0	1.985000E+00	2.277000E+01	0.000000E+00	0.000000E+00				
902	0	3	7.900000E+02	0.000000E+00	0.000000E+00	2.028000E+00	1.363000E+01	1.363000E+01	3.281553E-01	6.180000E+00
	0	0	1.985000E+00	2.277000E+01	0.000000E+00	0.000000E+00				

INPUT DATA FOR 8 SETS OF BUBBLE CONSTANTS.

SET NO.	SLOPE PARAMETER	BUBBLE VELOCITY	SLOPE PARAM. INDEX	BUBBLE VEL. INDEX
0	0.000000E+00	0.000000E+00	(DEFAULT DATA)	
1	8.000000E-01	3.000000E+00		
2	8.000000E-01	3.000000E+00		
3	8.000000E-01	8.000000E+00		
4	8.000000E-01	8.000000E+00		
5	8.000000E-01	5.000000E+00		
6	8.000000E-01	1.000000E+01		
7	8.000000E-01	1.000000E+01		
8	8.000000E-01	5.000000E+00		

DESCRIPTION OF 75 JUNCTIONS. (NOT NECESSARILY IN ORDER OF DATA ON JUNCTION CARDS)

JUN NUM	FROM VOL	TO VOL	PUMP FILL INDX	CHKV VALV INDX	FLOW REGIME INDX	SPRAY INDX	INITIAL FLOW (LBM/SEC)	JUNCTION FLOW AREA (FT**2)	JUNCTION ELEVATION (FT)	JUNCTION INERTIA (FT*-1)	SP. ENERGY LOSS COEF. (FORWARD)	SP. ENERGY LOSS COEF. (REVERSE)
VERT JUN INDX	CHOK -ING INDX	IC CALC INDX	MOM EQ. INDX	ENTH. INDX	FRICT. INDX	JUNCTION DIAMETER (FT)	CONTRACTION COEFFICIENT	JUNCTION ANGLE (DEGREES)				
1	1	2	0	0	0	0	1.877780E+04	9.180000E+00	0.000000E+00	1.251000E+00	-1.000000E+00	-1.000000E+00
	1	-1	0	0	0	0	2.417000E+00	0.000000E+00	0.000000E+00			
2	2	3	0	0	0	0	1.877780E+04	9.180000E+00	1.610000E+00	1.171600E+00	7.700000E-01	4.900000E-01
	0	-1	0	0	0	0	2.417000E+00	0.000000E+00	0.000000E+00			
3	3	4	0	0	0	0	1.877780E+04	2.136000E+01	6.700000E+00	2.827000E-01	3.500000E-01	4.800000E-01
	0	-1	0	0	0	0	6.460000E-02	0.000000E+00	0.000000E+00			
4	4	5	0	0	0	0	1.877780E+04	2.136000E+01	1.724000E+01	4.932000E-01	0.000000E+00	0.000000E+00
	0	-1	0	0	0	0	6.460000E-02	0.000000E+00	0.000000E+00			
5	5	7	0	0	0	0	1.877780E+04	2.136000E+01	2.774800E+01	7.398000E-01	3.800000E-02	3.800000E-02
	1	-1	0	0	0	0	6.460000E-02	0.000000E+00	0.000000E+00			
7	7	8	0	0	0	0	1.877780E+04	2.136000E+01	2.774800E+01	7.398000E-01	3.800000E-02	3.800000E-02
	1	-1	0	0	0	0	6.460000E-02	0.000000E+00	0.000000E+00			
8	8	9	0	0	0	0	1.877780E+04	2.136000E+01	1.724000E+01	4.932000E-01	0.000000E+00	0.000000E+00
	0	-1	0	0	0	0	6.460000E-02	0.000000E+00	0.000000E+00			
9	9	10	0	0	0	0	1.877780E+04	2.136000E+01	6.700000E+00	2.827000E-01	4.800000E-01	3.500000E-01
	0	-1	0	0	0	0	6.460000E-02	0.000000E+00	0.000000E+00			
10	10	11	0	0	0	0	1.877780E+04	1.048000E+01	1.610000E+00	1.225100E+00	4.900000E-01	7.700000E-01
	0	-1	0	0	0	0	2.583300E+00	0.000000E+00	0.000000E+00			
11	11	12	-2	0	0	0	1.877780E+04	1.048000E+01	-4.040000E+00	1.709800E+00	2.300000E-01	2.300000E-01
	0	-1	0	0	0	0	2.583300E+00	0.000000E+00	0.000000E+00			
12	12	13	2	0	0	0	1.877780E+04	8.240000E+00	0.000000E+00	1.660400E+00	0.000000E+00	0.000000E+00
	0	-1	0	0	0	0	2.291700E+00	0.000000E+00	0.000000E+00			
13	13	14	0	0	0	0	1.877780E+04	8.240000E+00	0.000000E+00	1.419000E+00	1.300000E+00	4.800000E+00
	1	-1	0	0	0	0	2.417000E+00	0.000000E+00	0.000000E+00			
14	14	15	0	0	0	0	1.874400E+04	1.544000E+01	-2.670000E+00	5.590000E-01	8.000000E-01	8.000000E-01
	0	-1	0	0	0	0	7.333000E-01	0.000000E+00	0.000000E+00			
15	15	16	0	0	0	0	1.874400E+04	1.544000E+01	-1.130000E+01	5.590000E-01	0.000000E+00	0.000000E+00
	0	-1	0	0	0	0	7.333000E-01	0.000000E+00	0.000000E+00			
16	16	17	0	0	0	0	1.874400E+04	1.544000E+01	-1.992000E+01	4.560000E-01	1.800000E+00	1.800000E+00
	0	-1	0	0	0	0	7.333000E-01	0.000000E+00	0.000000E+00			
17	17	18	0	0	0	0	2.713020E+04	4.142000E+01	-1.672000E+01	1.745000E-01	2.000000E+00	2.000000E+00
	0	-1	0	0	0	0	7.262000E+00	0.000000E+00	0.000000E+00			
18	18	19	0	0	0	0	2.713020E+04	4.142000E+01	-1.270000E+01	9.660000E-02	1.600000E+00	1.600000E+00
	0	-1	0	0	0	0	7.262000E+00	0.000000E+00	0.000000E+00			
19	19	20	0	0	0	0	2.713020E+04	4.142000E+01	-8.700000E+00	9.660000E-02	1.600000E+00	1.600000E+00
	0	-1	0	0	0	0	7.262000E+00	0.000000E+00	0.000000E+00			
20	20	1	0	0	0	0	2.713020E+04	4.142000E+01	-4.700000E+00	1.064000E-01	3.630000E+00	3.630000E+00
	1	-1	0	0	0	0	7.262000E+00	0.000000E+00	0.000000E+00			
21	21	1	0	0	0	0	9.858000E+02	1.320000E+00	-4.700000E+00	3.792000E+00	-1.000000E+00	-1.000000E+00
	1	-1	0	0	0	0	6.100000E-03	0.000000E+00	0.000000E+00			

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JUN NUM	FROM VOL	TO PUMP VOL	CHKV FILL	IC VALV	MOM EQ.	ENTH. INDX	FRICT. INDX	JUNCTION DIAMETER (FT)	CONTRACTION COEFFICIENT	JUNCTION ANGLE (DEGREES)	JUNCTION FLOW AREA (FT**2)	JUNCTION ELEVATION (FT)	JUNCTION INERTIA (FT*-1)	SP. ENERGY LOSS COEF. (FORWARD)	SP. ENERGY LOSS COEF. (REVERSE)
22	22	1	0	0	0	0	0	5.070000E+01	1.350000E+00	6.770000E+00	4.742000E-01	2.080000E+00	2.080000E+00		
	1	-1	0	0	0	0	0	1.950000E-01	0.000000E+00	0.000000E+00					
23	23	24	0	0	0	0	0	9.388900E+03	4.590000E+00	1.610000E+00	2.343200E+00	7.700000E-01	4.900000E-01		
	0	-1	0	0	0	0	0	2.417000E+00	0.000000E+00	0.000000E+00					
24	24	25	0	0	0	0	0	9.388900E+03	1.068000E+01	6.700000E+00	5.654000E-01	3.500000E-01	4.800000E-01		
	0	-1	0	0	0	0	0	6.460000E-02	0.000000E+00	0.000000E+00					
25	25	26	0	0	0	0	0	9.388900E+03	1.068000E+01	1.724000E+01	9.864000E-01	0.000000E+00	0.000000E+00		
	0	-1	0	0	0	0	0	6.460000E-02	0.000000E+00	0.000000E+00					
26	26	28	0	0	0	0	0	9.388900E+03	1.068000E+01	2.774800E+01	1.480000E+00	3.800000E-02	3.800000E-02		
	1	-1	0	0	0	0	0	6.460000E-02	0.000000E+00	0.000000E+00					
28	28	29	0	0	0	0	0	9.388900E+03	1.068000E+01	2.774800E+01	1.480000E+00	3.800000E-02	3.800000E-02		
	1	-1	0	0	0	0	0	6.460000E-02	0.000000E+00	0.000000E+00					
29	29	30	0	0	0	0	0	9.388900E+03	1.068000E+01	1.724000E+01	9.864000E-01	0.000000E+00	0.000000E+00		
	0	-1	0	0	0	0	0	6.460000E-02	0.000000E+00	0.000000E+00					
30	30	31	0	0	0	0	0	9.388900E+03	1.068000E+01	6.700000E+00	5.654000E-01	4.800000E-01	3.500000E-01		
	0	-1	0	0	0	0	0	6.460000E-02	0.000000E+00	0.000000E+00					
31	31	32	0	0	0	0	0	9.388900E+03	5.240000E+00	1.610000E+00	2.450200E+00	4.900000E-01	7.700000E-01		
	0	-1	0	0	0	0	0	2.583300E+00	0.000000E+00	0.000000E+00					
32	32	33	-1	0	0	0	0	9.388900E+03	5.240000E+00	-4.040000E+00	3.419600E+00	2.300000E-01	2.300000E-01		
	0	-1	0	0	0	0	0	2.583300E+00	0.000000E+00	0.000000E+00					
33	33	34	1	0	0	0	0	9.388900E+03	4.120000E+00	0.000000E+00	3.320800E+00	0.000000E+00	0.000000E+00		
	0	-1	0	0	0	0	0	2.291700E+00	0.000000E+00	0.000000E+00					
34	34	35	0	0	0	0	0	9.388900E+03	4.120000E+00	0.000000E+00	2.838000E+00	1.300000E+00	4.800000E+00		
	1	-1	0	0	0	0	0	2.417000E+00	0.000000E+00	0.000000E+00					
35	35	36	0	0	0	0	0	9.372000E+03	7.720000E+00	-2.670000E+00	1.118000E+00	8.000000E-01	8.000000E-01		
	0	-1	0	0	0	0	0	7.333000E-01	0.000000E+00	0.000000E+00					
36	36	37	0	0	0	0	0	9.372000E+03	7.720000E+00	-1.130000E+01	1.118000E+00	0.000000E+00	0.000000E+00		
	0	-1	0	0	0	0	0	7.333000E-01	0.000000E+00	0.000000E+00					
37	37	17	0	0	0	0	0	9.372000E+03	7.720000E+00	-1.992000E+01	9.120000E-01	1.800000E+00	1.800000E+00		
	0	-1	0	0	0	0	0	7.333000E-01	0.000000E+00	0.000000E+00					
39	39	40	0	0	-99	0	0	0.000000E+00	7.900000E-01	9.130000E+00	4.852000E+01	2.800000E+00	2.800000E+00		
	1	-1	0	0	0	0	0	8.750000E-01	0.000000E+00	0.000000E+00					
40	40	23	0	0	0	0	0	0.000000E+00	6.000000E-01	0.000000E+00	5.000500E+01	0.000000E+00	1.150000E+00		
	0	-1	0	3	0	0	0	8.750000E-01	0.000000E+00	0.000000E+00					
42	17	21	0	0	0	0	0	9.858000E+02	2.742000E+00	-1.672000E+01	5.313000E+00	1.500000E+00	1.500000E+00		
	0	-1	0	0	0	0	0	1.950000E-02	0.000000E+00	0.000000E+00					
43	1	23	0	0	0	0	0	9.388900E+03	4.590000E+00	0.000000E+00	2.502000E+00	-1.000000E+00	-1.000000E+00		
	1	-1	0	0	0	0	0	2.417000E+00	0.000000E+00	0.000000E+00					
44	35	22	0	0	0	0	0	1.690000E+01	6.250000E-03	5.960000E+00	2.615500E+02	-1.000000E+00	-1.000000E+00		
	0	-1	0	0	0	0	0	8.740000E-02	0.000000E+00	0.000000E+00					

JUN NUM	FROM VOL	TO PUMP VOL	CHKV FILL	FLOW VALV	SPRAY REGIME	INITIAL FLOW (LBM/SEC)	JUNCTION FLOW AREA (FT**2)	JUNCTION ELEVATION (FT)	JUNCTION INERTIA (FT*-1)	SP. ENERGY LOSS COEF. (FORWARD)	SP. ENERGY LOSS COEF. (REVERSE)
VERT JUN INDX	CHOK -ING INDX	IC CALC INDX	MOM EQ. INDX	ENTH. INDX	FRICT. INDX	JUNCTION DIAMETER (FT)	CONTRACTION COEFFICIENT	JUNCTION ANGLE (DEGREES)			
45	14	22	0	0	0	3.380000E+01	1.250000E-02	5.960000E+00	1.307800E+02	-1.000000E+00	-1.000000E+00
	0	-1	0	0	0	8.740000E-02	0.000000E+00	0.000000E+00			
75	23	900	0	1	0	0.000000E+00	4.910000E-02	0.000000E+00	4.244000E+00	1.500000E+00	1.500000E+00
	0	0	0	0	0	2.500000E-01	0.000000E+00	0.000000E+00			
92	0	13	16	0	0	0.000000E+00	1.000000E+00	0.000000E+00	2.770000E-01	1.000000E+00	1.000000E+00
	0	-1	0	0	0	2.187000E-01	0.000000E+00	0.000000E+00			
94	0	13	7	0	0	0.000000E+00	2.000000E+00	1.140000E+00	2.300000E-01	1.000000E+00	1.000000E+00
	0	-1	0	0	0	7.292000E-01	0.000000E+00	0.000000E+00			
95	0	34	7	0	0	0.000000E+00	1.000000E+00	1.140000E+00	4.590000E-01	1.000000E+00	1.000000E+00
	0	-1	0	0	0	7.292000E-01	0.000000E+00	0.000000E+00			
100	701	101	0	0	0	9.351900E+02	1.053400E+00	8.530000E+00	3.024000E-01	1.000000E+00	5.000000E-01
	0	-1	2	0	0	2.354200E+00	0.000000E+00	0.000000E+00			
101	101	131	0	0	0	9.351900E+02	4.350000E+00	6.206000E+01	8.197000E+00	6.100000E-01	1.010000E+00
	0	-1	0	0	0	2.354200E+00	0.000000E+00	0.000000E+00			
131	131	132	0	0	0	9.351900E+02	1.396000E+00	3.640000E+01	3.104460E+01	5.900000E-01	5.900000E-01
	0	-1	0	0	0	1.333300E+00	0.000000E+00	0.000000E+00			
132	0	132	2	0	0	0.000000E+00	1.000000E+00	2.277000E+01	2.315000E+01	1.000000E+00	1.000000E+00
	0	-1	0	0	0	1.128400E+00	0.000000E+00	0.000000E+00			
134	0	132	19	0	0	0.000000E+00	1.000000E+00	2.277000E+01	2.350200E+01	1.000000E+00	1.000000E+00
	1	-1	0	0	0	1.616000E-01	0.000000E+00	0.000000E+00			
135	0	132	17	0	0	0.000000E+00	1.000000E+00	2.277000E+01	2.315000E+01	1.000000E+00	1.000000E+00
	0	-1	0	0	0	1.128400E+00	0.000000E+00	0.000000E+00			
151	0	132	8	0	0	0.000000E+00	1.000000E+00	2.277000E+01	2.315000E+01	1.000000E+00	1.000000E+00
	0	-1	0	0	0	1.128400E+00	0.000000E+00	0.000000E+00			
152	0	132	9	0	0	0.000000E+00	1.000000E+00	2.277000E+01	2.315000E+01	1.000000E+00	1.000000E+00
	0	-1	0	0	0	1.128400E+00	0.000000E+00	0.000000E+00			
153	0	132	10	0	0	0.000000E+00	1.000000E+00	2.277000E+01	2.315000E+01	1.000000E+00	1.000000E+00
	0	-1	0	0	0	1.128400E+00	0.000000E+00	0.000000E+00			
154	0	132	11	0	0	0.000000E+00	1.000000E+00	2.277000E+01	2.315000E+01	1.000000E+00	1.000000E+00
	0	-1	0	0	0	1.128400E+00	0.000000E+00	0.000000E+00			
190	0	101	5	0	0	0.000000E+00	1.000000E+00	8.530000E+00	3.024000E-01	1.000000E+00	5.000000E-01
	0	-1	0	0	0	1.161500E+00	0.000000E+00	0.000000E+00			
200	801	201	0	0	0	1.870380E+03	2.106800E+00	8.530000E+00	1.512000E-01	1.000000E+00	5.000000E-01
	0	-1	2	0	0	2.354200E+00	0.000000E+00	0.000000E+00			
201	201	231	0	0	0	1.870380E+03	8.700000E+00	6.206000E+01	4.098500E+00	6.100000E-01	1.010000E+00
	0	-1	0	0	0	2.354200E+00	0.000000E+00	0.000000E+00			
231	231	232	0	0	0	1.870380E+03	2.792000E+00	3.640000E+01	1.760660E+01	5.900000E-01	5.900000E-01
	0	-1	0	0	0	1.333300E+00	0.000000E+00	0.000000E+00			
232	0	232	4	0	0	0.000000E+00	2.000000E+00	2.277000E+01	1.084000E+01	1.000000E+00	1.000000E+00
	0	-1	0	0	0	1.128400E+00	0.000000E+00	0.000000E+00			

JUN NUM	FROM VOL	TO PUMP VOL	FILL VALV	CHKV	FLOW REGIME	SPRAY	INITIAL FLOW (LBM/SEC)	JUNCTION FLOW AREA (FT**2)	JUNCTION ELEVATION (FT)	JUNCTION INERTIA (FT*-1)	SP. ENERGY LOSS COEF. (FORWARD)	SP. ENERGY LOSS COEF. (REVERSE)
INDX	INDX	INDX	INDX	INDX	INDX	INDX	JUNCTION DIAMETER (FT)	CONTRACTION COEFFICIENT	JUNCTION ANGLE (DEGREES)			
234	0	232	20	0	0	0	0.000000E+00	2.000000E+00	2.277000E+01	1.084000E+01	1.000000E+00	1.000000E+00
	1	-1	0	0	0	0	1.616000E-01	0.000000E+00	0.000000E+00			
235	0	232	18	0	0	0	0.000000E+00	2.000000E+00	2.277000E+01	1.084000E+01	1.000000E+00	1.000000E+00
	0	-1	0	0	0	0	1.128400E+00	0.000000E+00	0.000000E+00			
251	0	232	12	0	0	0	0.000000E+00	2.000000E+00	2.277000E+01	1.084000E+01	1.000000E+00	1.000000E+00
	0	-1	0	0	0	0	1.128400E+00	0.000000E+00	0.000000E+00			
252	0	232	13	0	0	0	0.000000E+00	2.000000E+00	2.277000E+01	1.084000E+01	1.000000E+00	1.000000E+00
	0	-1	0	0	0	0	1.128400E+00	0.000000E+00	0.000000E+00			
253	0	232	14	0	0	0	0.000000E+00	2.000000E+00	2.277000E+01	1.084000E+01	1.000000E+00	1.000000E+00
	0	-1	0	0	0	0	1.128400E+00	0.000000E+00	0.000000E+00			
254	0	232	15	0	0	0	0.000000E+00	2.000000E+00	2.277000E+01	1.084000E+01	1.000000E+00	1.000000E+00
	0	-1	0	0	0	0	1.128400E+00	0.000000E+00	0.000000E+00			
290	0	201	6	0	0	0	0.000000E+00	2.000000E+00	8.530000E+00	1.512000E-01	1.000000E+00	5.000000E-01
	0	-1	0	0	0	0	1.161500E+00	0.000000E+00	0.000000E+00			
500	500	13	0	2	0	0	0.000000E+00	8.360000E-01	-7.800000E-02	1.000000E+02	7.380000E+00	1.000000E+20
	1	-1	0	3	0	0	7.290000E-01	1.000000E+00	0.000000E+00			
501	501	34	0	3	0	0	0.000000E+00	4.180000E-01	-7.800000E-02	2.000000E+02	7.380000E+00	1.000000E+20
	1	-1	0	3	0	0	7.290000E-01	1.000000E+00	0.000000E+00			
600	0	15	21	0	0	0	0.000000E+00	1.000000E+00	-7.000000E+00	1.000000E+00	1.000000E+00	1.000000E+00
	0	-1	0	0	0	0	1.000000E+00	1.000000E+00	0.000000E+00			
601	0	36	22	0	0	0	0.000000E+00	1.000000E+00	-7.000000E+00	1.000000E+00	1.000000E+00	1.000000E+00
	0	-1	0	0	0	0	1.000000E+00	1.000000E+00	0.000000E+00			
700	0	701	1	0	0	0	9.351900E+02	1.000000E+00	8.530000E+00	3.024000E-01	1.000000E+00	5.000000E-01
	0	-1	0	0	0	0	1.161500E+00	0.000000E+00	0.000000E+00			
800	0	801	3	0	0	0	1.870380E+03	2.000000E+00	8.530000E+00	1.512000E-01	1.000000E+00	5.000000E-01
	0	-1	0	0	0	0	1.161500E+00	0.000000E+00	0.000000E+00			
901	132	901	0	0	0	0	9.351900E+02	3.090000E+00	2.277000E+01	0.000000E+00	-1.000000E+00	-1.000000E+00
	0	-1	2	0	0	0	1.985000E+00	0.000000E+00	0.000000E+00			
902	232	902	0	0	0	0	1.870380E+03	6.180000E+00	2.277000E+01	0.000000E+00	-1.000000E+00	-1.000000E+00
	0	-1	2	0	0	0	1.985000E+00	0.000000E+00	0.000000E+00			

PARAMETERS IN JUNCTION CONNECTION MATRIX.

NUMBER OF CHAINS (MS) = 8
 NUMBER OF CHAIN JUNCTIONS (NJUNC) = 36
 NUMBER OF NON-CHAIN JUNCTIONS (NQ) = 16
 INDEX OF FIRST FILL JUNCTION (MJUNF) = 53
 TOTAL NUMBER OF JUNCTIONS (NJUN) = 75

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INPUT DATA FOR 6 GENERALIZED DATA TABLES.

CURV NUM	NUM PTS	INDEPENDENT VARIABLE	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	DEPENDENT VARIABLE
1	-4	0.000000E+00	0.000000E+00	9.999999E-04	0.000000E+00	2.000000E-03	1.000000E+00
		9.000000E+00	1.000000E+00				
2	-4	0.000000E+00	1.000000E+00	9.999999E-04	1.000000E+00	2.000000E-03	0.000000E+00
		9.000000E+00	0.000000E+00				
3	-2	0.000000E+00	0.000000E+00	3.059999E+01	-4.760098E+02		
4	-2	0.000000E+00	0.000000E+00	3.059999E+01	-4.760098E+02		
5	-3	0.000000E+00	0.000000E+00	9.999996E-02	1.000000E+00	1.000000E+06	1.000000E+00
6	-3	0.000000E+00	0.000000E+00	9.999996E-02	1.000000E+00	1.000000E+06	1.000000E+00

INPUT DATA FOR 3 VALVES.

VALV NUM	TRIP ID	AREA TABL	AREA TABL	BACK PRESSURE FOR CLOSING	FORWARD FRIC. COEFF.	OPEN REVERSE FRIC. COEFF.	CLOSED REVERSE FRIC. COEFF.
1	-15	1	2	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00
2	-21	5	0	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00
3	-22	6	0	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00

DESCRIPTIONS FOR 22 FILL SYSTEMS.

FILL NUM	NUM PTS	TRIP ID	IND VAR	DEP VAR	TIME PRESSURE DIF PRES	(0) (1) (-1)	MASS FLUX LB/S/FT**2 GPM/FT**2	(0) (1)	FILL ENTH. BTU/LBM	FILL PRES. PSIA
1	-2	3	0	0	0.000000E+00 5.000000E+01		9.351900E+02 9.351900E+02	4.179300E+02 4.179300E+02	8.254000E+02 8.254000E+02	
2	-2	10	0	0	0.000000E+00 1.000000E+03		0.000000E+00 0.000000E+00	1.198400E+03 1.198400E+03	7.742000E+02 7.742000E+02	
3	-2	9	0	0	0.000000E+00 5.000000E+01		9.351900E+02 9.351900E+02	4.179300E+02 4.179300E+02	8.254000E+02 8.254000E+02	
4	-2	10	0	0	0.000000E+00 1.000000E+03		0.000000E+00 0.000000E+00	1.198400E+03 1.198400E+03	7.742000E+02 7.742000E+02	
5	-2	19	0	0	0.000000E+00 5.000000E+01		4.175000E+01 4.175000E+01	5.150000E+01 5.150000E+01	1.300000E+03 1.300000E+03	
6	-2	20	0	0	0.000000E+00 5.000000E+01		4.175000E+01 4.175000E+01	5.150000E+01 5.150000E+01	1.300000E+03 1.300000E+03	
7	-7	2	39	0	1.500000E+01 6.150000E+02 1.015000E+03 1.265000E+03 1.415000E+03 1.470000E+03 1.800000E+03		4.850000E+01 3.700000E+01 2.667000E+01 1.833000E+01 6.670000E+00 0.000000E+00 0.000000E+00	5.200000E+01 5.200000E+01 5.200000E+01 5.200000E+01 5.200000E+01 5.200000E+01 5.200000E+01	1.500000E+03 1.500000E+03 1.500000E+03 1.500000E+03 1.500000E+03 1.500000E+03 1.500000E+03	
8	-2	5	132	0	1.100000E+03 1.125000E+03		-1.836500E+02 -1.888000E+02	1.000000E+00 1.000000E+00	1.000000E+00 1.000000E+00	
9	-2	6	132	0	1.100000E+03 1.125000E+03		-1.836500E+02 -1.888000E+02	1.000000E+00 1.000000E+00	1.000000E+00 1.000000E+00	
10	-2	7	132	0	1.140000E+03 1.155000E+03		-2.782700E+02 -2.819300E+02	1.000000E+00 1.000000E+00	1.000000E+00 1.000000E+00	
11	-2	8	132	0	1.140000E+03 1.155000E+03		-2.782700E+02 -2.819300E+02	1.000000E+00 1.000000E+00	1.000000E+00 1.000000E+00	

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12	-2	11	232	0	1.100000E+03 1.125000E+03	-1.836500E+02 -1.888000E+02	1.000000E+00 1.000000E+00	1.000000E+00 1.000000E+00
13	-2	12	232	0	1.100000E+03 1.125000E+03	-1.836500E+02 -1.888000E+02	1.000000E+00 1.000000E+00	1.000000E+00 1.000000E+00
14	-2	13	232	0	1.140000E+03 1.155000E+03	-2.782700E+02 -2.819300E+02	1.000000E+00 1.000000E+00	1.000000E+00 1.000000E+00
15	-2	14	232	0	1.140000E+03 1.155000E+03	-2.782700E+02 -2.819300E+02	1.000000E+00 1.000000E+00	1.000000E+00 1.000000E+00
16	-2	2	0	0	0.000000E+00 5.000000E+01	2.400000E+01 2.400000E+01	5.500000E+01 5.500000E+01	2.725000E+03 2.725000E+03
17	-1	1000	-13	0	-4.760100E+02	-4.760100E+02	1.000000E+00	1.000000E+00
18	-1	1000	-14	0	-4.760100E+02	-4.760100E+02	1.000000E+00	1.000000E+00
19	-2	19	0	0	0.000000E+00 5.000000E+01	-3.703000E-01 -3.703000E-01	1.100000E+03 1.100000E+03	1.000000E+03 1.000000E+03
20	-2	20	0	0	0.000000E+00 5.000000E+01	-3.703000E-01 -3.703000E-01	1.100000E+03 1.100000E+03	1.000000E+03 1.000000E+03
21	-2	23	1	0	0.000000E+00 2.000000E+03	0.000000E+00 1.000000E+01	5.000000E+02 5.000000E+02	5.000000E+02 5.000000E+02
22	-2	24	1	0	0.000000E+00 2.000000E+03	0.000000E+00 1.000000E+01	5.000000E+02 5.000000E+02	5.000000E+02 5.000000E+02

USER SUPPLIED CURVE SET
 PUMP CURVE SET NUMBER 1 HAS 8 CURVES TO BE READ.

SET NUM	HEAD OR TORQ	TYPE	NUM DAT PTS	X	Y	X	Y	X	Y
1	1	1	4	FLOW/SPEED 0.000000E+00 1.000000E+00	HEAD/SPEED**2 1.750000E+00 1.000000E+00	FLOW/SPEED 6.000000E-01	HEAD/SPEED**2 1.250000E+00	FLOW/SPEED 8.000000E-01	HEAD/SPEED**2 1.250000E+00
1	1	2	4	SPEED/FLOW 0.000000E+00 1.000000E+00	HEAD/FLOW**2 -1.550000E+00 1.000000E+00	SPEED/FLOW 6.000000E-01	HEAD/FLOW**2 -1.500000E-01	SPEED/FLOW 7.000000E-01	HEAD/FLOW**2 1.000000E-01
1	1	3	2	FLOW/SPEED -1.000000E+00	HEAD/SPEED**2 4.240000E+00	FLOW/SPEED 0.000000E+00	HEAD/SPEED**2 1.750000E+00	FLOW/SPEED	HEAD/SPEED**2
1	1	4	2	SPEED/FLOW -1.000000E+00	HEAD/FLOW**2 4.250000E+00	SPEED/FLOW 0.000000E+00	HEAD/FLOW**2 1.650000E+00	SPEED/FLOW	HEAD/FLOW**2
1	2	1	2	FLOW/SPEED 0.000000E+00	TORQ/SPEED**2 9.500000E-01	FLOW/SPEED 1.000000E+00	TORQ/SPEED**2 1.000000E+00	FLOW/SPEED	TORQ/SPEED**2
1	2	2	2	SPEED/FLOW 0.000000E+00	TORQ/FLOW**2 -1.500000E+00	SPEED/FLOW 1.000000E+00	TORQ/FLOW**2 1.000000E+00	SPEED/FLOW	TORQ/FLOW**2
1	2	3	2	FLOW/SPEED -1.000000E+00	TORQ/SPEED**2 3.050000E+00	FLOW/SPEED 0.000000E+00	TORQ/SPEED**2 9.500000E-01	FLOW/SPEED	TORQ/SPEED**2
1	2	4	2	SPEED/FLOW -1.000000E+00	TORQ/FLOW**2 3.050000E+00	SPEED/FLOW 0.000000E+00	TORQ/FLOW**2 1.450000E+00	SPEED/FLOW	TORQ/FLOW**2

USER SUPPLIED CURVE SET
 PUMP CURVE SET NUMBER 1 HEAD CURVES FOLLOW.

SET NUM	HEAD OR TORQ	TYPE	NUM DAT PTS	X	Y	X	Y	X	Y
1	1	1	4	FLOW/SPEED 0.000000E+00 1.000000E+00	HEAD/SPEED**2 1.750000E+00 1.000000E+00	FLOW/SPEED 6.000000E-01	HEAD/SPEED**2 1.250000E+00	FLOW/SPEED 8.000000E-01	HEAD/SPEED**2 1.250000E+00
1	1	2	4	SPEED/FLOW 0.000000E+00 1.000000E+00	HEAD/FLOW**2 -1.550000E+00 1.000000E+00	SPEED/FLOW 6.000000E-01	HEAD/FLOW**2 -1.500000E-01	SPEED/FLOW 7.000000E-01	HEAD/FLOW**2 1.000000E-01
1	1	3	2	FLOW/SPEED -1.000000E+00	HEAD/SPEED**2 4.240000E+00	FLOW/SPEED 0.000000E+00	HEAD/SPEED**2 1.750000E+00	FLOW/SPEED	HEAD/SPEED**2
1	1	4	2	SPEED/FLOW -1.000000E+00	HEAD/FLOW**2 4.250000E+00	SPEED/FLOW 0.000000E+00	HEAD/FLOW**2 1.650000E+00	SPEED/FLOW	HEAD/FLOW**2

USER SUPPLIED CURVE SET
 PUMP CURVE SET NUMBER 1 TORQUE CURVES FOLLOW.

SET NUM	HEAD OR TORQ	TYPE	NUM DAT PTS	X	Y	X	Y	X	Y
1	2	1	2	FLOW/SPEED 0.000000E+00	TORQ/SPEED**2 9.500000E-01	FLOW/SPEED 1.000000E+00	TORQ/SPEED**2 1.000000E+00	FLOW/SPEED	TORQ/SPEED**2
1	2	2	2	SPEED/FLOW 0.000000E+00	TORQ/FLOW**2 -1.500000E+00	SPEED/FLOW 1.000000E+00	TORQ/FLOW**2 1.000000E+00	SPEED/FLOW	TORQ/FLOW**2
1	2	3	2	FLOW/SPEED -1.000000E+00	TORQ/SPEED**2 3.050000E+00	FLOW/SPEED 0.000000E+00	TORQ/SPEED**2 9.500000E-01	FLOW/SPEED	TORQ/SPEED**2
1	2	4	2	SPEED/FLOW -1.000000E+00	TORQ/FLOW**2 3.050000E+00	SPEED/FLOW 0.000000E+00	TORQ/FLOW**2 1.450000E+00	SPEED/FLOW	TORQ/FLOW**2

INPUT DATA FOR 9 HEAT CONDUCTOR GEOMETRIES.

GEOMETRY NUMBER	GEOMETRY TYPE	REGION NUMBER	GAP INDEX	MATERIAL NUMBER	MESH INCREMENTS	DIST. TO LEFT SURF.	REGION WIDTH	POWER FRACTION
1	2	1		1	6	0.000000E+00	1.485000E-02	1.000000E+00
		2	0	3	2		3.125000E-04	0.000000E+00
		3	0	2	4		2.500000E-03	0.000000E+00
2	2	1		4	3	3.230000E-02	4.166700E-03	0.000000E+00
3	1	1		6	3	0.000000E+00	8.220000E-01	0.000000E+00
4	1	1		6	3	0.000000E+00	1.126000E+00	0.000000E+00
5	1	1		5	3	0.000000E+00	2.083000E-01	0.000000E+00
6	1	1		6	3	0.000000E+00	7.530000E-02	0.000000E+00
7	1	1		6	3	0.000000E+00	4.322000E-01	0.000000E+00
8	1	1		5	3	0.000000E+00	7.940000E-01	0.000000E+00
9	1	1		5	3	0.000000E+00	2.152000E-01	0.000000E+00

DESCRIPTION OF 4 CONDUCTOR STACKS

STACK NUM.	L OR R SIDE INDICATOR	NUMBER OF AXIAL NODES	QUENCH TEMPERATURE	AXIAL MESH SPACING													
-----					CONDUCTOR NUMBERS IN THIS STACK												
1	-1	3	0.000000E+00	0.000000E+00													
4	5	6															
2	-1	3	0.000000E+00	0.000000E+00													
9	8	7															
3	-1	3	0.000000E+00	0.000000E+00													
10	11	12															
4	-1	3	0.000000E+00	0.000000E+00													
15	14	13															
NONSTACKED HEAT CONDUCTOR NUMBERS					16	17	18	19	20	21	22	23	24	25	26	27	
	1	2	3														
	28	29	30	31	32	33	34	35									

DATA FOR 35 HEAT CONDUCTORS.

COND NUM	L VOL	R VOL	GEOM NUM	LEFT SURFACE AREA (FT**2)	RIGHT SURFACE AREA (FT**2)	VOLUME (FT**3)	LEFT HYDRAULIC DIAMETER (FT)	RIGHT HYDRAULIC DIAMETER (FT)	LFT HEATED EQ DIAMETER (FT)	RHT HEATED EQ DIAMETER (FT)
		L C R C IND IND	LEFT CHANNEL LENGTH (FT)		RIGHT CHANNEL LENGTH (FT)		HEAT EXCHANGER BALANCE FLAG	CONDUCTOR ELEVATION	NUMBER OF TUBES (COND. H. T.)	
1	0	18	1	0.000000E+00	1.422080E+04	1.256000E+02	0.000000E+00	0.000000E+00	0.000000E+00	4.660000E-02
		10	10	0.000000E+00	4.000000E+00	0	0.000000E+00	1		
2	0	19	1	0.000000E+00	1.422080E+04	1.256000E+02	0.000000E+00	0.000000E+00	0.000000E+00	4.660000E-02
		10	10	0.000000E+00	4.000000E+00	0	0.000000E+00	1		
3	0	20	1	0.000000E+00	1.422080E+04	1.256000E+02	0.000000E+00	0.000000E+00	0.000000E+00	4.660000E-02
		10	10	0.000000E+00	4.000000E+00	0	0.000000E+00	1		
16	0	2	5	0.000000E+00	2.960000E+02	6.700000E+01	0.000000E+00	2.420000E+00	0.000000E+00	2.420000E+00
		2	2	0.000000E+00	2.080000E+01	0	0.000000E+00	1		
17	0	3	6	0.000000E+00	2.736600E+03	2.060000E+02	0.000000E+00	6.000000E+00	0.000000E+00	6.000000E+00
		2	2	0.000000E+00	0.000000E+00	0	0.000000E+00	1		
18	0	10	6	0.000000E+00	2.736600E+03	2.060000E+02	0.000000E+00	6.000000E+00	0.000000E+00	6.000000E+00
		2	2	0.000000E+00	0.000000E+00	0	0.000000E+00	1		
19	0	11	8	0.000000E+00	4.380000E+02	1.040000E+02	0.000000E+00	2.580000E+00	0.000000E+00	2.580000E+00
		2	2	0.000000E+00	0.000000E+00	0	0.000000E+00	1		
20	0	12	8	0.000000E+00	3.534000E+02	5.046000E+02	0.000000E+00	3.500000E+00	0.000000E+00	3.500000E+00
		2	2	0.000000E+00	0.000000E+00	0	0.000000E+00	1		
21	0	13	9	0.000000E+00	2.560000E+02	5.520000E+01	0.000000E+00	2.290000E+00	0.000000E+00	2.290000E+00
		2	2	0.000000E+00	1.980000E+01	0	0.000000E+00	1		
22	0	14	3	0.000000E+00	2.424000E+02	2.000000E+02	0.000000E+00	0.000000E+00	0.000000E+00	1.470000E+00
		2	2	0.000000E+00	0.000000E+00	0	0.000000E+00	1		
23	0	15	3	0.000000E+00	2.424000E+02	2.000000E+02	0.000000E+00	0.000000E+00	0.000000E+00	1.470000E+00
		2	2	0.000000E+00	0.000000E+00	0	0.000000E+00	1		
24	0	16	3	0.000000E+00	2.424000E+02	2.000000E+02	0.000000E+00	0.000000E+00	0.000000E+00	1.470000E+00
		2	2	0.000000E+00	0.000000E+00	0	0.000000E+00	1		
25	0	17	7	0.000000E+00	2.777000E+02	1.219400E+02	0.000000E+00	6.800000E-01	0.000000E+00	0.000000E+00
		2	2	0.000000E+00	0.000000E+00	0	0.000000E+00	1		
26	0	23	5	0.000000E+00	1.480000E+02	3.350000E+01	0.000000E+00	2.420000E+00	0.000000E+00	2.420000E+00
		2	2	0.000000E+00	2.080000E+01	0	0.000000E+00	1		
27	0	24	6	0.000000E+00	1.368300E+03	1.030000E+02	0.000000E+00	6.000000E+00	0.000000E+00	6.000000E+00
		2	2	0.000000E+00	0.000000E+00	0	0.000000E+00	1		
28	0	31	6	0.000000E+00	1.368300E+03	1.030000E+02	0.000000E+00	6.000000E+00	0.000000E+00	6.000000E+00
		2	2	0.000000E+00	0.000000E+00	0	0.000000E+00	1		

29	0	32	8	0.000000E+00 0.000000E+00	2.190000E+02 0.000000E+00	5.200000E+01 0	0.000000E+00 0.000000E+00	2.580000E+00 1	0.000000E+00	2.580000E+00
30	0	33	8	0.000000E+00 0.000000E+00	1.767000E+02 0.000000E+00	2.523000E+02 0	0.000000E+00 0.000000E+00	3.500000E+00 1	0.000000E+00	3.500000E+00
31	0	34	9	0.000000E+00 0.000000E+00	1.280000E+02 1.980000E+01	2.760000E+01 0	0.000000E+00 0.000000E+00	2.290000E+00 1	0.000000E+00	2.290000E+00
32	0	35	3	0.000000E+00 0.000000E+00	1.212000E+02 0.000000E+00	1.000000E+02 0	0.000000E+00 0.000000E+00	0.000000E+00 1	0.000000E+00	1.470000E+00
33	0	36	3	0.000000E+00 0.000000E+00	1.212000E+02 0.000000E+00	1.000000E+02 0	0.000000E+00 0.000000E+00	0.000000E+00 1	0.000000E+00	1.470000E+00
34	0	37	3	0.000000E+00 0.000000E+00	1.212000E+02 0.000000E+00	1.000000E+02 0	0.000000E+00 0.000000E+00	0.000000E+00 1	0.000000E+00	1.470000E+00
35	0	22	4	0.000000E+00 0.000000E+00	2.432000E+02 0.000000E+00	2.722000E+02 0	0.000000E+00 0.000000E+00	0.000000E+00 1	0.000000E+00	0.000000E+00
4	4	201	2	1.149860E+04 8.710000E+00	1.296400E+04 8.710000E+00	5.112000E+01 2	0.000000E+00 4.350000E+00	1.118500E-01 1	0.000000E+00	1.118500E-01
5	5	201	2	1.395580E+04 1.054000E+01	1.573400E+04 1.054000E+01	6.208000E+01 2	0.000000E+00 1.398000E+01	1.118500E-01 1	0.000000E+00	1.118500E-01
6	7	201	2	1.395400E+04 9.340000E+00	1.573200E+04 9.340000E+00	6.160000E+01 2	0.000000E+00 2.392000E+01	1.118500E-01 1	0.000000E+00	1.118500E-01
9	9	201	2	1.149860E+04 8.710000E+00	1.296400E+04 8.710000E+00	5.112000E+01 2	0.000000E+00 4.350000E+00	1.118500E-01 1	0.000000E+00	1.118500E-01
8	8	201	2	1.395580E+04 1.054000E+01	1.573400E+04 1.054000E+01	6.208000E+01 2	0.000000E+00 1.398000E+01	1.118500E-01 1	0.000000E+00	1.118500E-01
7	7	201	2	1.395400E+04 9.340000E+00	1.573200E+04 9.340000E+00	6.160000E+01 2	0.000000E+00 2.392000E+01	1.118500E-01 1	0.000000E+00	1.118500E-01
10	25	101	2	5.749300E+03 8.710000E+00	6.482000E+03 8.710000E+00	2.556000E+01 1	0.000000E+00 4.350000E+00	1.118500E-01 1	0.000000E+00	1.118500E-01
11	26	101	2	6.977900E+03 1.054000E+01	7.867000E+03 1.054000E+01	3.104000E+01 1	0.000000E+00 1.398000E+01	1.118500E-01 1	0.000000E+00	1.118500E-01
12	28	101	2	6.977000E+03 9.340000E+00	7.866000E+03 9.340000E+00	3.080000E+01 1	0.000000E+00 2.392000E+01	1.118500E-01 1	0.000000E+00	1.118500E-01
15	30	101	2	5.749300E+03 8.710000E+00	6.482000E+03 8.710000E+00	2.556000E+01 1	0.000000E+00 4.350000E+00	1.118500E-01 1	0.000000E+00	1.118500E-01
14	29	101	2	6.977900E+03 1.054000E+01	7.867000E+03 1.054000E+01	3.104000E+01 1	0.000000E+00 1.398000E+01	1.118500E-01 1	0.000000E+00	1.118500E-01
13	28	101	2	6.977000E+03 9.340000E+00	7.866000E+03 9.340000E+00	3.080000E+01 1	0.000000E+00 2.392000E+01	1.118500E-01 1	0.000000E+00	1.118500E-01

***** WARNING - INPUT HEAT TRANSFER AREA FOR SLAB 19 IS GREATER THAN 1.001 TIMES THE MAXIMUM IMPLIED BY THE INPUT SLAB VOLUME AND GEOMETRY.

LEFT HEAT TRANS AREA = 0.000000E+00, IMPLIED MAX = 0.1309824E+03
RIGHT HEAT TRANS AREA = 0.438000E+03, IMPLIED MAX = 0.1309824E+03

***** WARNING - INPUT HEAT TRANSFER AREA FOR SLAB 29 IS GREATER THAN 1.001 TIMES THE MAXIMUM IMPLIED BY THE INPUT SLAB VOLUME AND GEOMETRY.

LEFT HEAT TRANS AREA = 0.000000E+00, IMPLIED MAX = 0.6549118E+02
RIGHT HEAT TRANS AREA = 0.219000E+03, IMPLIED MAX = 0.6549118E+02

***** WARNING - INPUT HEAT TRANSFER AREA FOR SLAB 35 IS GREATER THAN 1.001 TIMES THE MAXIMUM IMPLIED BY THE INPUT SLAB VOLUME AND GEOMETRY.

LEFT HEAT TRANS AREA = 0.000000E+00, IMPLIED MAX = 0.2417407E+03
RIGHT HEAT TRANS AREA = 0.243200E+03, IMPLIED MAX = 0.2417407E+03

***** WARNING - INPUT HEAT TRANSFER AREA FOR SLAB 6 IS GREATER THAN 1.001 TIMES THE MAXIMUM IMPLIED BY THE INPUT SLAB VOLUME AND GEOMETRY.

LEFT HEAT TRANS AREA = 0.1395400E+05, IMPLIED MAX = 0.1388810E+05
RIGHT HEAT TRANS AREA = 0.1573200E+05, IMPLIED MAX = 0.1567966E+05

***** WARNING - INPUT HEAT TRANSFER AREA FOR SLAB 7 IS GREATER THAN 1.001 TIMES THE MAXIMUM IMPLIED BY THE INPUT SLAB VOLUME AND GEOMETRY.

LEFT HEAT TRANS AREA = 0.1395400E+05, IMPLIED MAX = 0.1388810E+05
RIGHT HEAT TRANS AREA = 0.1573200E+05, IMPLIED MAX = 0.1567966E+05

***** WARNING - INPUT HEAT TRANSFER AREA FOR SLAB 12 IS GREATER THAN 1.001 TIMES THE MAXIMUM IMPLIED BY THE INPUT SLAB VOLUME AND GEOMETRY.

LEFT HEAT TRANS AREA = 0.6977000E+04, IMPLIED MAX = 0.6944050E+04
RIGHT HEAT TRANS AREA = 0.7866000E+04, IMPLIED MAX = 0.7839832E+04

***** WARNING - INPUT HEAT TRANSFER AREA FOR SLAB 13 IS GREATER THAN 1.001 TIMES THE MAXIMUM IMPLIED BY THE INPUT SLAB VOLUME AND GEOMETRY.

LEFT HEAT TRANS AREA = 0.6977000E+04, IMPLIED MAX = 0.6944050E+04
RIGHT HEAT TRANS AREA = 0.7866000E+04, IMPLIED MAX = 0.7839832E+04

INPUT DATA FOR 3 CORE SECTIONS.

CORE COND	INITIAL CLAD	SECTION POWER
SECT NUM	THICKNESS	FRACTION
1 1	0.000000E+00	3.345399E-01
2 2	0.000000E+00	3.569500E-01
3 3	0.000000E+00	3.085099E-01

NO METAL WATER REACTION WILL BE CALCULATED

SUM OF POWER FRACTION = 1.0000000

PROPERTIES FOR HEAT CONDUCTING MATERIAL NUMBER 1

	THERMAL CONDUCTIVITY (BTU/FT-HR-F) VS TEMPERATURE (T(1),K(1),----)					
-11 POINTS	2.120000E+02	4.280000E+00	3.920000E+02	3.470000E+00	7.520000E+02	2.660000E+00
	1.112000E+03	2.200000E+00	1.472000E+03	1.880000E+00	1.832000E+03	1.620000E+00
	2.192000E+03	1.440000E+00	2.912000E+03	1.210000E+00	3.632000E+03	1.160000E+00
	5.072000E+03	1.160000E+00	5.500000E+03	1.160000E+00		

	VOL HEAT CAPACITY (BTU/FT**3-F) VS TEMPERATURE (T(1),C(1),----)					
-19 POINTS	7.700000E+01	3.622000E+01	1.000000E+02	3.712000E+01	2.000000E+02	4.005000E+01
	3.000000E+02	4.198000E+01	4.000000E+02	4.388000E+01	6.000000E+02	4.518000E+01
	8.000000E+02	4.641000E+01	1.000000E+03	4.732000E+01	2.400000E+03	5.077000E+01
	2.600000E+03	5.143000E+01	2.800000E+03	5.261000E+01	3.000000E+03	5.457000E+01
	3.200000E+03	5.742000E+01	3.400000E+03	6.123000E+01	3.600000E+03	6.593000E+01
	4.600000E+03	9.515000E+01	4.800000E+03	9.931000E+01	5.000000E+03	1.015700E+02
	5.074000E+03	1.017600E+02				

PROPERTIES FOR HEAT CONDUCTING MATERIAL NUMBER 2

THERMAL CONDUCTIVITY (BTU/FT-HR-F) VS TEMPERATURE (T(1),K(1),----)

-8 POINTS	0.000000E+00	8.000000E+00	1.490000E+03	1.232000E+01	2.150000E+03	1.750000E+01
	2.372000E+03	1.970000E+01	2.552000E+03	2.180000E+01	2.732000E+03	2.400000E+01
	3.292000E+03	2.890000E+01	3.360000E+03	3.310000E+01		

VOL HEAT CAPACITY (BTU/FT**3-F) VS TEMPERATURE (T(1),C(1),----)

15 POINTS	3.200000E+01	2.875000E+01	9.320000E+02	3.256000E+01	1.112000E+03	3.440000E+01
	1.184000E+03	3.522000E+01	1.490000E+03	3.522000E+01	1.508000E+03	4.914000E+01
	1.544000E+03	5.774000E+01	1.580000E+03	6.020000E+01	1.616000E+03	7.043000E+01
	1.652000E+03	7.985000E+01	1.688000E+03	7.535000E+01	1.724000E+03	5.938000E+01
	1.760000E+03	4.586000E+01	1.787000E+03	3.481000E+01	3.300000E+03	3.481000E+01

PROPERTIES FOR HEAT CONDUCTING MATERIAL NUMBER 3

		THERMAL CONDUCTIVITY (BTU/FT-HR-F) VS TEMPERATURE (T(1),K(1),----)					
-6 POINTS	1.000000E+02	9.370000E-02	1.100000E+03	1.630000E-01	2.100000E+03	2.120000E-01	
	3.100000E+03	2.530000E-01	4.100000E+03	2.890000E-01	5.100000E+03	3.220000E-01	
		VOL HEAT CAPACITY (BTU/FT**3-F) VS TEMPERATURE (T(1),C(1),----)					
-2 POINTS	3.200000E+01	5.190000E-01	3.400000E+03	5.190000E-01			

PROPERTIES FOR HEAT CONDUCTING MATERIAL NUMBER 4

		THERMAL CONDUCTIVITY (BTU/FT-HR-F) VS TEMPERATURE (T(1),K(1),----)					
-8 POINTS	1.000000E+02	8.500000E+00	3.000000E+02	9.500000E+00	4.000000E+02	1.000000E+01	
	5.000000E+02	1.050000E+01	6.000000E+02	1.100000E+01	7.000000E+02	1.150000E+01	
	9.000000E+02	1.260000E+01	1.100000E+03	1.380000E+01			
		VOL HEAT CAPACITY (BTU/FT**3-F) VS TEMPERATURE (T(1),C(1),----)					
-8 POINTS	1.000000E+02	5.540000E+01	3.000000E+02	5.880000E+01	4.000000E+02	6.010000E+01	
	5.000000E+02	6.110000E+01	6.000000E+02	6.210000E+01	7.000000E+02	6.300000E+01	
	9.000000E+02	6.560000E+01	1.100000E+03	6.920000E+01			

PROPERTIES FOR HEAT CONDUCTING MATERIAL NUMBER 5

THERMAL CONDUCTIVITY (BTU/FT-HR-F) VS TEMPERATURE (T(1),K(1),----)
-3 POINTS 0.000000E+00 9.000000E+00 2.000000E+02 9.000000E+00 1.600000E+03 1.500000E+01

VOL HEAT CAPACITY (BTU/FT**3-F) VS TEMPERATURE (T(1),C(1),----)
-2 POINTS 2.000000E+02 6.000000E+01 2.200000E+03 8.000000E+01

PROPERTIES FOR HEAT CONDUCTING MATERIAL NUMBER 6

THERMAL CONDUCTIVITY (BTU/FT-HR-F) VS TEMPERATURE (T(1),K(1),----)
 -2 POINTS 7.000000E+01 3.150000E+01 1.000000E+03 2.240000E+01
 VOL HEAT CAPACITY (BTU/FT**3-F) VS TEMPERATURE (T(1),C(1),----)
 -2 POINTS 0.000000E+00 6.000000E+01 2.000000E+03 8.000000E+01

POWER CURVE DATA TABLE 1.

DATA PTS	TRIP ID	TIME	NORM. POWER	TIME	NORM. POWER	TIME	NORM. POWER
9	30	0.000000E+00	1.000000E+00	2.000000E-01	9.730000E-01	6.000000E-01	5.300000E-01
		8.000000E-01	2.900000E-01	1.160000E+00	1.000000E-01	2.200000E+00	6.000000E-02
		4.300000E+00	5.000000E-02	7.700000E+00	3.500000E-02	8.000000E+02	2.000000E-02

INPUT DATA FOR 2 STEAM GENERATORS OR FEEDWATER SYSTEMS

STEAM GEN. NUMBER	BIAS JNCT NUMBER	OUTLET JNCT NUMBER	POWR FRAC REMOVED
1	700	101	0.333333
2	800	201	0.666667

STEADY STATE INITIALIZATION CONVERGENCE CRITERIA

MAX. NUMBER OF ITERATIONS	MAX. JUNCTION ACCEL. PSI	MAX. ENTHALPY ERROR DU/DT/W	MAX. MASS IM- BAL. DM/DT	MAX. SLIP VEL ERROR DVS/V5
25	5.00000E-05	5.00000E-06	5.00000E-08	5.00000E-05

MINOR EDIT IDENTIFICATION PAIRS

EDIT VARIABLE - REGION NUMBER

1	2	3	4	5	6	7	8	9	10
COUT -25	TRIP 30	COUT -15	COUT -16	COUT -23	COUT -24	WP** 1	PRES 39	WP** 13	WP** 100
11	12	13	14	15	16	17	18	19	20
WP** 43	WP** 34	WP** 190	WP** 200	WP** 201	WP** 290	WP** 95	WP** 94	WP** 92	PRES 101
21	22	23	24	25	26	27	28	29	30
PRES 201	TEMP 23	TEMP 34	TEMP 2	TEMP 13	PNRM 0	AVED 23	WQ** 101	WQ** 201	LIQL 101
31	32	33	34	35	36	37	38	39	40
LIQL 201	LIQL 39	TEMP 14	TEMP 16	TEMP 35	TEMP 37	WP** 75	TRIP 16	WP** 901	WP** 902
41	42	43	44	45	46	47	48	49	50
PRES 901	PRES 902	PRES 23	HP** 200	HP** 100	HW** 101	HW** 201	PRES 701	PRES 801	WP** 700
51									
WP** 800									

STEADY-STATE CONVERGED IN 11 ITERATIONS.

BEGIN MINET STEADY STATE CALCULATIONS

BEGIN MINET SS OUTER PASS NO. 1
ERROR NUMBER 110 CALLED FROM PRFL3S

BEGIN MINET SS OUTER PASS NO. 2

MINET, TIME= 0.00000 TIME STEP=0.00000 STEP NO. 0
 MINIMUM TIME CONSTANT= 2.000E-01 SEC,LIMIT KEY= 0

SYSTEM BOUNDARY CONDITIONS:

ID	NETWORK	FLOW(KG/S)	ENTHALPY(MJ/KG)	PRESSURE(MPA)	TEMP(K)	FLUID
413	1	848.390	2.787225	5.445780	542.074	H2O
412	1	1272.585	1.899268	3.892000	521.547	H2O
414	1	0.000	2.787224	4.892000	535.337	H2O
416	1	0.000	2.787224	5.000000	536.694	H2O
411	1	424.195	2.787221	5.445780	542.074	H2O
403	2	181.930	2.740000	4.230611	526.489	H2O
406	2	181.930	1.601100	4.200000	526.054	H2O
401	3	1272.610	0.808474	3.137137	463.121	H2O
402	3	423.993	0.971289	5.769228	498.800	H2O
404	3	848.617	0.971289	5.768861	498.800	H2O

SYSTEM NETWORKS AND SUB-NETWORKS

NETWORK	SUB-NETWORK	SUM WE, IN(MW)	SUM WE, OUT(MW)
1	1	3546.980046	2416.980046
2	2	498.488200	291.288200
3	3	1028.872097	1236.072097

SUB-NETWORK BRIDGES

SUBNET1	SUBNET2	Q, BRIDG(MW)	K, BRIDG	F, BRIDG
1	1	-1130.000000	0	1.000
1	2	0.000000	0	1.000
1	3	0.000000	0	1.000
2	1	0.000000	0	1.000
2	2	0.000000	0	1.000
2	3	207.200000	0	1.000
3	1	0.000000	0	1.000
3	2	-207.200000	0	1.000
3	3	0.000000	0	1.000

SYSTEM VOLUMES

ID	PRESSURE(MPA)	ENTHALPY(MJ/KG)	TEMP(K)	LEVEL(RELATIVE)	HEAT INPUT(MJ/S)	NETWORK	REGIONS
111	5.443681	2.787224	542.049	0.000000	0.000000	1	1
112	5.167312	2.787224	538.754	0.000000	0.000000	1	1
101	5.989401	0.971289	498.793	0.000000	0.000000	3	1

SYSTEM SEGMENTS

SEG	NETWK	WIN(KG/S)	WOUT(KG/S)	WBAR(KG/S)	ALPHA IS IN MPA*SEC*SEC/KG/KG		PIN(MPA)	POUT(MPA)	ALPHA, SEG	BETA(MPA)	CONNECTS TO:	
					EIN(MJ/KG)	EOUT(MJ/KG)					IN	OUT
1	1	848.390	848.390	848.390	2.787225	2.787225	5.445780	5.443817	0.235E-08	-0.000272	413	111
2	1	1272.585	1272.585	1272.585	2.787224	2.787224	5.443681	5.167312	0.171E-06	0.000000	111	112
3	1	1272.585	1272.585	1272.585	2.787224	1.899268	5.167312	3.892000	0.787E-06	0.000000	112	412
4	1	0.000	0.000	0.000	2.787224	2.787224	5.167441	4.892000	0.238E+09	0.000000	112	414
5	1	0.000	0.000	0.000	2.787224	2.787224	5.443545	5.000000	0.229E+09	-0.000391	111	416
6	1	424.195	424.195	424.195	2.787221	2.787221	5.445780	5.443817	0.940E-08	-0.000272	411	111
7	2	181.930	181.930	181.930	2.740000	1.601100	4.230611	4.200000	0.949E-06	0.000816	403	406
8	3	1272.610	1272.610	1272.610	0.808474	0.971289	3.137137	5.989401	0.105E-05	4.553497	401	101
9	3	423.993	423.993	423.993	0.971289	0.971289	5.989401	5.769228	0.137E-05	0.026179	101	402

10 3 848.617 848.617 848.617 0.971289 0.971289 5.989401 5.768861 0.343E-06 0.026179 101 404

IN-SEGMENT DISTRIBUTIONS													JIN	JOUT
SEG	MODID	NODE	EIN(MJ/KG)	EBAR(MJ/KG)	EOUT(MJ/KG)	WIN(KG/S)	WOUT(KG/S)	TIN(K)	TBAR(K)	TOUT(K)	DENS(KG/M3)	QA(MJ/S)	JIN	JOUT
1	23	1	2.787225	2.787225	2.787225	848.390	848.390	542.048	542.048	542.048	27.702	0.000	1	2
2	22	2	2.787224	2.787224	2.787224	1272.585	1272.585	540.411	540.411	540.411	26.975	0.000	3	4
2	22	3	2.787224	2.787224	2.787224	1272.585	1272.585	540.411	540.411	540.411	26.975	0.000	4	5
2	22	4	2.787224	2.787224	2.787224	1272.585	1272.585	540.411	540.411	540.411	26.975	0.000	5	6
3	601	5	2.787224	2.343246	1.899268	1272.585	1272.585	538.754	530.610	521.547	30.976	-1130.000	7	8
4	502	6	2.787224	2.787224	2.787224	0.000	0.000	537.064	537.064	537.064	25.539	0.000	9	10
5	501	7	2.787224	2.787224	2.787224	0.000	0.000	539.414	539.414	539.414	26.541	0.000	11	12
6	21	8	2.787221	2.787221	2.787221	424.195	424.195	542.048	542.048	542.048	27.702	0.000	13	14
7	301	9	2.740000	2.170550	1.601100	181.930	181.930	526.273	526.273	526.273	33.133	-207.200	15	16
8	1	10	0.808474	0.808474	0.808474	1272.610	1272.610	462.950	462.950	462.950	876.725	0.000	17	18
8	201	11	0.808474	0.808474	0.808474	1272.610	1272.610	462.950	462.950	462.950	876.725	0.000	18	19
8	2	12	0.808474	0.808474	0.808474	1272.610	1272.610	462.950	462.950	462.950	876.725	0.000	19	20
8	301	13	0.808474	0.889882	0.971289	1272.610	1272.610	462.950	481.120	498.836	856.800	207.200	20	21
8	3	14	0.971289	0.971289	0.971289	1272.610	1272.610	498.836	498.836	498.836	835.656	0.000	21	22
8	3	15	0.971289	0.971289	0.971289	1272.610	1272.610	498.836	498.836	498.836	835.656	0.000	22	23
9	5	16	0.971289	0.971289	0.971289	423.993	423.993	498.797	498.797	498.797	836.932	0.000	24	25
9	5	17	0.971289	0.971289	0.971289	423.993	423.993	498.797	498.797	498.797	836.932	0.000	25	26
9	5	18	0.971289	0.971289	0.971289	423.993	423.993	498.797	498.797	498.797	836.932	0.000	26	27
10	4	19	0.971289	0.971289	0.971289	848.617	848.617	498.797	498.797	498.797	836.932	0.000	28	29
10	4	20	0.971289	0.971289	0.971289	848.617	848.617	498.797	498.797	498.797	836.932	0.000	29	30
10	4	21	0.971289	0.971289	0.971289	848.617	848.617	498.797	498.797	498.797	836.932	0.000	30	31

SYSTEM MODULES

MODULE 1 IS B.C. NUMBER 1, MODID 413,NPATH= 0
 MODULE 2 IS PIPE NUMBER 1, MODID 23,NPATH= 2
 MODULE 3 IS VOL. NUMBER 1, MODID 111,NPATH= 1
 MODULE 4 IS PIPE NUMBER 2, MODID 22,NPATH= 3
 MODULE 5 IS VOL. NUMBER 2, MODID 112,NPATH= 1
 MODULE 6 IS TBSG NUMBER 1, MODID 601,NPATH= 1
 SPEED IN RPM IS 1800.00, EFFICIENCY IS 0.40397, POWER FROM GEN -1.074E+09 J/S
 MODULE 7 IS B.C. NUMBER 2, MODID 412,NPATH= 0
 MODULE 8 IS VALV NUMBER 1, MODID 502,NPATH= 1
 RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.689E-04,AS DETERMINED USING OPTION 1
 MODULE 9 IS B.C. NUMBER 3, MODID 414,NPATH= 0
 MODULE 10 IS VALV NUMBER 2, MODID 501,NPATH= 1
 RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.726E-04,AS DETERMINED USING OPTION 1
 MODULE 11 IS B.C. NUMBER 4, MODID 416,NPATH= 0
 MODULE 12 IS B.C. NUMBER 5, MODID 411,NPATH= 0
 MODULE 13 IS PIPE NUMBER 3, MODID 21,NPATH= 1
 MODULE 14 IS B.C. NUMBER 6, MODID 403,NPATH= 0
 MODULE 15 IS H.X. NUMBER 1, MODID 301,NPATH= 1

THE HEAT FLUX AREA CORRECTION FACTOR IS 0.782411

T	NOD	I	NOD	O	NOD	QINR(KJ/S/M)	TINR(K)	T	TUBE(K)	TOUTR(K)	QOUTR(KJ/S/M)	MODE,I	MODE,O	T,CORE	T,STRC
1	13	9				9.95311	481.12037	493.23464	526.27282		-9.99739	1	6	481.1	526.3
MODULE 16	IS	B.C.	NUMBER	7,	MODID	406,NPATH=	0								
MODULE 17	IS	B.C.	NUMBER	8,	MODID	401,NPATH=	0								
MODULE 18	IS	PIPE	NUMBER	4,	MODID	1,NPATH=	1								
MODULE 19	IS	PUMP	NUMBER	1,	MODID	201,NPATH=	2								
		PUMP	SPEED=	3570.000	PUMP	FLOW=	636.305	KG/S	PUMP	HEAD=	532.746	METERS			
MODULE 20	IS	PIPE	NUMBER	5,	MODID	2,NPATH=	1								
MODULE 21	IS	PIPE	NUMBER	6,	MODID	3,NPATH=	1								
MODULE 22	IS	VOL.	NUMBER	3,	MODID	101,NPATH=	1								
MODULE 23	IS	PIPE	NUMBER	7,	MODID	5,NPATH=	1								
MODULE 24	IS	B.C.	NUMBER	9,	MODID	402,NPATH=	0								
MODULE 25	IS	PIPE	NUMBER	8,	MODID	4,NPATH=	2								
MODULE 26	IS	B.C.	NUMBER	10,	MODID	404,NPATH=	0								

VOLUME DATA ACTUALLY BEING USED.

VOL NUM	PRESSURE (PSIA)	ENTHALPY (BTU/LBM)	MIXTURE LEVEL (FT)	EQUIVALENT DIAM. (FT)	FLOW LENGTH (FT)	HORIZ. AREA (FT**2)	SATURATION TEMP. (F)	ENTH CONV (DU/DT/W)
1	2.281523E+03	6.203860E+02	1.167000E+01	1.400000E+00	1.156863E+01	8.089117E+01	6.561656E+02	-2.694770E-12
2	2.257042E+03	6.203419E+02	3.590000E+00	2.416700E+00	2.080610E+01	5.320334E+01	6.545454E+02	2.789831E-12
3	2.258017E+03	6.203831E+02	5.910000E+00	5.940000E+00	5.473000E+00	4.546531E+01	6.546101E+02	4.959700E-14
4	2.251289E+03	6.002746E+02	1.054000E+01	6.460000E-02	1.053421E+01	2.132827E+01	6.541630E+02	2.010513E-07
5	2.244464E+03	5.813959E+02	1.054000E+01	6.460000E-02	1.053421E+01	2.132827E+01	6.537087E+02	2.612152E-07
7	2.235967E+03	5.577072E+02	9.405000E+00	6.460000E-02	2.106842E+01	4.780436E+01	6.531419E+02	-2.612953E-07
8	2.233880E+03	5.485874E+02	1.054000E+01	6.460000E-02	1.053421E+01	2.132827E+01	6.530025E+02	-1.579690E-07
9	2.233866E+03	5.425445E+02	1.054000E+01	6.460000E-02	1.053421E+01	2.132827E+01	6.530015E+02	-4.301026E-08
10	2.235609E+03	5.425614E+02	5.910000E+00	5.940000E+00	5.473000E+00	4.546531E+01	6.531180E+02	-9.051453E-13
11	2.227018E+03	5.425429E+02	1.205000E+01	2.583300E+00	2.492366E+01	2.167635E+01	6.525434E+02	7.439550E-13
12	2.274464E+03	5.429668E+02	5.190000E+00	3.500000E+00	2.000000E+01	7.398844E+01	6.556994E+02	-4.104152E-12
13	2.308977E+03	5.429271E+02	2.290000E+00	2.291700E+00	1.878000E+01	7.056769E+01	6.579705E+02	9.671415E-13
14	2.300954E+03	5.429582E+02	8.630000E+00	7.333000E-01	8.630000E+00	2.132097E+01	6.574443E+02	3.114827E-13
15	2.300802E+03	5.429693E+02	8.630000E+00	7.333000E-01	8.630000E+00	2.132097E+01	6.574344E+02	-6.210805E-14
16	2.303315E+03	5.429804E+02	8.630000E+00	7.333000E-01	8.630000E+00	2.132097E+01	6.575993E+02	0.000000E+00
17	2.301911E+03	5.430000E+02	9.790000E+00	6.800000E-01	1.750000E+01	7.436159E+01	6.575072E+02	7.648088E-12
18	2.296326E+03	5.698762E+02	4.020000E+00	4.117000E-02	4.000483E+00	4.121891E+01	6.571403E+02	1.287296E-13
19	2.292047E+03	5.985598E+02	4.000000E+00	4.117000E-02	4.000483E+00	4.142500E+01	6.568590E+02	8.581973E-15
20	2.287700E+03	6.233500E+02	4.100000E+00	4.117000E-02	4.000483E+00	4.041463E+01	6.565728E+02	1.373116E-13
21	2.297621E+03	5.429866E+02	1.210000E+01	2.400000E-02	1.200000E+01	3.512397E+00	6.572255E+02	-1.771383E-13
22	2.279439E+03	5.429609E+02	7.670000E+00	2.930000E+00	8.541493E+00	6.696219E+01	6.560281E+02	1.973263E-12
23	2.257137E+03	6.203419E+02	3.590000E+00	2.416700E+00	2.080610E+01	2.660167E+01	6.545517E+02	2.851828E-12
24	2.258112E+03	6.203831E+02	5.910000E+00	5.940000E+00	5.473000E+00	2.274112E+01	6.546164E+02	0.000000E+00
25	2.251384E+03	6.002728E+02	1.054000E+01	6.460000E-02	1.053421E+01	1.066414E+01	6.541694E+02	2.026259E-07
26	2.244559E+03	5.813934E+02	1.054000E+01	6.460000E-02	1.053421E+01	1.066414E+01	6.537150E+02	2.586251E-07
28	2.236062E+03	5.577057E+02	9.405000E+00	6.460000E-02	2.106842E+01	2.390218E+01	6.531482E+02	-2.624396E-07
29	2.233975E+03	5.485866E+02	1.054000E+01	6.460000E-02	1.053421E+01	1.066414E+01	6.530088E+02	-1.569245E-07
30	2.233961E+03	5.425445E+02	1.054000E+01	6.460000E-02	1.053421E+01	1.066414E+01	6.530079E+02	-4.189476E-08
31	2.235704E+03	5.425614E+02	5.910000E+00	5.940000E+00	5.473000E+00	2.274112E+01	6.531243E+02	-9.175445E-13
32	2.227113E+03	5.425429E+02	1.205000E+01	2.583300E+00	2.492366E+01	1.083817E+01	6.525498E+02	7.439550E-13
33	2.274559E+03	5.429668E+02	5.190000E+00	3.500000E+00	2.000000E+01	3.699422E+01	6.557057E+02	-4.190947E-12
34	2.309072E+03	5.429271E+02	2.290000E+00	2.291700E+00	1.878000E+01	3.528384E+01	6.579768E+02	1.016739E-12
35	2.301049E+03	5.429582E+02	8.630000E+00	7.333000E-01	8.630000E+00	1.064890E+01	6.574506E+02	3.795333E-13
36	2.300897E+03	5.429693E+02	8.630000E+00	7.333000E-01	8.630000E+00	1.064890E+01	6.574406E+02	-4.968644E-14
37	2.303412E+03	5.429804E+02	8.620000E+00	7.333000E-01	8.630000E+00	1.066125E+01	6.576056E+02	0.000000E+00
39	2.250000E+03	7.438333E+02	2.184000E+01	6.969000E+00	3.408495E+01	3.571429E+01	6.540773E+02	0.000000E+00
40	2.255943E+03	6.203368E+02	9.230000E+00	8.750000E-01	5.866667E+01	3.813651E+00	6.544724E+02	0.000000E+00
101	8.301470E+02	5.472700E+02	3.825000E+01	4.290000E+00	1.811000E+01	8.834299E+01	5.220445E+02	3.385939E-10
131	8.212265E+02	1.198306E+03	3.242000E+01	2.007500E+00	4.290221E+01	4.194941E+00	5.207933E+02	4.979323E-13
132	8.040000E+02	1.198312E+03	1.363000E+01	2.007500E+00	1.440063E+02	3.349230E+01	5.183479E+02	-9.958646E-13

VOLUME DATA ACTUALLY BEING USED.

VOL NUM	PRESSURE (PSIA)	ENTHALPY (BTU/LBM)	MIXTURE LEVEL (FT)	EQUIVALENT DIAM. (FT)	FLOW LENGTH (FT)	HORIZ. AREA (FT**2)	SATURATION TEMP. (F)	ENTH CONV (DU/DT/W)
201	8.300945E+02	5.472700E+02	3.825000E+01	4.290000E+00	1.811000E+01	1.766860E+02	5.220371E+02	3.372246E-10
231	8.211741E+02	1.198308E+03	3.242000E+01	2.007500E+00	4.290221E+01	8.389883E+00	5.207860E+02	1.244831E-12
232	8.040000E+02	1.198313E+03	1.363000E+01	2.007500E+00	1.372240E+02	6.382979E+01	5.183479E+02	-2.116212E-12
500	6.147000E+02	4.800584E+01	1.239000E+01	9.610000E+00	1.734000E+01	1.449712E+02	8.000000E+01	0.000000E+00
501	6.147000E+02	4.800584E+01	1.239000E+01	9.610000E+00	1.734000E+01	7.248558E+01	8.000000E+01	0.000000E+00
701	8.367559E+02	4.175945E+02	2.000000E+00	1.158115E+00	1.104993E+02	5.820000E+01	5.229648E+02	-2.589248E-10
801	8.367026E+02	4.175961E+02	2.000000E+00	1.158000E+00	1.104993E+02	1.164000E+02	5.229574E+02	-2.573843E-10
900	1.470000E+01	1.189965E+03	0.000000E+00	1.300000E+02	1.500000E+02	1.020942E+04	2.119436E+02	0.000000E+00
901	7.898437E+02	1.201003E+03	1.363000E+01	1.985000E+00	3.281553E-01	7.439472E-02	5.163311E+02	1.198872E+03
902	7.898437E+02	1.201003E+03	1.363000E+01	1.985000E+00	3.281553E-01	1.487894E-01	5.163311E+02	1.198873E+03

BUBBLE DATA ACTUALLY BEING USED.

BUBBLE SET	* INPUT VALUES *		* CALC. VALUES *	
	ALPH	VBUB	ALPH	VBUB
0	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00
1	8.000000E-01	3.000000E+00	8.000000E-01	3.000000E+00
2	8.000000E-01	3.000000E+00	8.000000E-01	3.000000E+00
3	8.000000E-01	8.000000E+00	8.000000E-01	8.242699E+00
4	8.000000E-01	8.000000E+00	8.000000E-01	8.240704E+00
5	8.000000E-01	5.000000E+00	8.000000E-01	5.000000E+00
6	8.000000E-01	1.000000E+01	8.000000E-01	1.000000E+01
7	8.000000E-01	1.000000E+01	8.000000E-01	1.000000E+01
8	8.000000E-01	5.000000E+00	8.000000E-01	5.000000E+00

***** WARNING *****

BUBBLE RISE CONSTANTS GENERATED FOR STEADY-STATE BALANCE MAY RESULT IN ANOMOLOUS BEHAVIOR FOR SOME TRANSIENTS.
 ENGINEERING JUDGEMENT SHOULD BE EXERCISED BEFORE COMPUTED CONSTANTS ARE USED FOR TRANSIENT CALCULATIONS.

JUNCTION DATA ACTUALLY BEING USED.

JUN NUM	FROM VOL	TO VOL	INITIAL FLOW (LBM/SEC)	TIME DEP. AREA (FT**2)	JUNCTION DIAMETER (FT)	JUNCTION INERTIA (FT**-1)	SP. ENERGY LOSS COEF. (FORWARD)	SP. ENERGY LOSS COEF. (REVERSE)	ENTH. TRANS. INLET-OUTLET	FILL ENTHALPY BIAS (BTU/LBM)
1	1	2	1.877780E+04	9.180000E+00	2.417000E+00	1.251000E+00	1.335252E+00	1.335252E+00	NO	NO
2	2	3	1.877780E+04	9.180000E+00	2.417000E+00	1.171600E+00	7.700000E-01	4.900000E-01	NO	NO
3	3	4	1.877780E+04	2.136000E+01	6.460000E-02	2.827000E-01	3.500000E-01	4.800000E-01	NO	NO
4	4	5	1.877780E+04	2.136000E+01	6.460000E-02	4.932000E-01	0.000000E+00	0.000000E+00	NO	NO
5	5	7	1.877780E+04	2.136000E+01	6.460000E-02	7.398000E-01	3.800000E-02	3.800000E-02	NO	NO
7	7	8	1.877780E+04	2.136000E+01	6.460000E-02	7.398000E-01	3.800000E-02	3.800000E-02	NO	NO
8	8	9	1.877780E+04	2.136000E+01	6.460000E-02	4.932000E-01	0.000000E+00	0.000000E+00	NO	NO
9	9	10	1.877780E+04	2.136000E+01	6.460000E-02	2.827000E-01	4.800000E-01	3.500000E-01	NO	NO
10	10	11	1.877780E+04	1.048000E+01	2.583300E+00	1.225100E+00	4.900000E-01	7.700000E-01	NO	NO
11	11	12	1.877780E+04	1.048000E+01	2.583300E+00	1.709800E+00	2.300000E-01	2.300000E-01	NO	NO
12	12	13	1.877780E+04	8.240000E+00	2.291700E+00	1.660400E+00	0.000000E+00	0.000000E+00	NO	NO
13	13	14	1.877780E+04	8.240000E+00	2.417000E+00	1.419000E+00	1.300000E+00	4.800000E+00	NO	NO
14	14	15	1.874400E+04	1.544000E+01	7.333000E-01	5.590000E-01	8.000000E-01	8.000000E-01	NO	NO
15	15	16	1.874400E+04	1.544000E+01	7.333000E-01	5.590000E-01	0.000000E+00	0.000000E+00	NO	NO
16	16	17	1.874400E+04	1.544000E+01	7.333000E-01	4.560000E-01	1.800000E+00	1.800000E+00	NO	NO
17	17	18	2.713020E+04	4.142000E+01	7.262000E+00	1.745000E-01	2.000000E+00	2.000000E+00	NO	NO
18	18	19	2.713020E+04	4.142000E+01	7.262000E+00	9.660000E-02	1.600000E+00	1.600000E+00	NO	NO
19	19	20	2.713020E+04	4.142000E+01	7.262000E+00	9.660000E-02	1.600000E+00	1.600000E+00	NO	NO
20	20	1	2.713020E+04	4.142000E+01	7.262000E+00	1.064000E-01	3.630000E+00	3.630000E+00	NO	NO
21	21	1	9.858000E+02	1.320000E+00	6.100000E-03	3.792000E+00	8.841298E+00	8.841298E+00	NO	NO
22	22	1	5.070000E+01	1.350000E+00	1.950000E-01	4.742000E-01	2.080000E+00	2.080000E+00	NO	NO
23	23	24	9.388900E+03	4.590000E+00	2.417000E+00	2.343200E+00	7.700000E-01	4.900000E-01	NO	NO
24	24	25	9.388900E+03	1.068000E+01	6.460000E-02	5.654000E-01	3.500000E-01	4.800000E-01	NO	NO
25	25	26	9.388900E+03	1.068000E+01	6.460000E-02	9.864000E-01	0.000000E+00	0.000000E+00	NO	NO
26	26	28	9.388900E+03	1.068000E+01	6.460000E-02	1.480000E+00	3.800000E-02	3.800000E-02	NO	NO
28	28	29	9.388900E+03	1.068000E+01	6.460000E-02	1.480000E+00	3.800000E-02	3.800000E-02	NO	NO
29	29	30	9.388900E+03	1.068000E+01	6.460000E-02	9.864000E-01	0.000000E+00	0.000000E+00	NO	NO
30	30	31	9.388900E+03	1.068000E+01	6.460000E-02	5.654000E-01	4.800000E-01	3.500000E-01	NO	NO
31	31	32	9.388900E+03	5.240000E+00	2.583300E+00	2.450200E+00	4.900000E-01	7.700000E-01	NO	NO
32	32	33	9.388900E+03	5.240000E+00	2.583300E+00	3.419600E+00	2.300000E-01	2.300000E-01	NO	NO
33	33	34	9.388900E+03	4.120000E+00	2.291700E+00	3.320800E+00	0.000000E+00	0.000000E+00	NO	NO
34	34	35	9.388900E+03	4.120000E+00	2.417000E+00	2.838000E+00	1.300000E+00	4.800000E+00	NO	NO
35	35	36	9.372000E+03	7.720000E+00	7.333000E-01	1.118000E+00	8.000000E-01	8.000000E-01	NO	NO
36	36	37	9.372000E+03	7.720000E+00	7.333000E-01	1.118000E+00	0.000000E+00	0.000000E+00	NO	NO
37	37	17	9.372000E+03	7.720000E+00	7.333000E-01	9.120000E-01	1.800000E+00	1.800000E+00	NO	NO
39	39	40	0.000000E+00	7.900000E-01	8.750000E-01	4.855200E+01	2.800000E+00	2.800000E+00	NO	NO
40	40	23	0.000000E+00	6.000000E-01	8.750000E-01	5.000500E+01	0.000000E+00	1.150000E+00	NO	NO
42	17	21	9.858000E+02	2.742000E+00	1.950000E-02	5.313000E+00	1.500000E+00	1.500000E+00	NO	NO
43	1	23	9.388900E+03	4.590000E+00	2.417000E+00	2.502000E+00	1.336118E+00	1.336118E+00	NO	NO
44	35	22	1.690000E+01	6.250000E-03	8.740000E-02	2.615500E+02	1.538902E+00	1.538902E+00	NO	NO

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JUNCTION DATA ACTUALLY BEING USED.

JUN NUM	FROM VOL	TO VOL	INITIAL FLOW (LBM/SEC)	TIME DEP. AREA (FT**2)	JUNCTION DIAMETER (FT)	JUNCTION INERTIA (FT**-1)	SP. ENERGY LOSS COEF. (FORWARD)	SP. ENERGY LOSS COEF. (REVERSE)	ENTH. TRANS. INLET-OUTLET	FILL ENTHALPY BIAS (BTU/LBM)
45	14	22	3.380000E+01	1.250000E-02	8.740000E-02	1.307800E+02	1.533198E+00	1.533198E+00	NO	NO
75	23	900	0.000000E+00	0.000000E+00	2.500000E-01	4.244000E+00	1.500000E+00	1.500000E+00	NO	NO
100	701	101	9.351900E+02	1.053400E+00	2.354200E+00	5.255140E+01	1.000000E+00	5.000000E-01	NO	NO
101	101	131	9.351900E+02	4.350000E+00	2.354200E+00	8.197000E+00	6.100000E-01	1.010000E+00	NO	NO
131	131	132	9.351900E+02	1.396000E+00	1.333300E+00	3.104460E+01	5.900000E-01	5.900000E-01	NO	NO
200	801	201	1.870380E+03	2.106800E+00	2.354200E+00	2.627570E+01	1.000000E+00	5.000000E-01	NO	NO
201	201	231	1.870380E+03	8.700000E+00	2.354200E+00	4.098500E+00	6.100000E-01	1.010000E+00	NO	NO
231	231	232	1.870380E+03	2.792000E+00	1.333300E+00	1.760660E+01	5.900000E-01	5.900000E-01	NO	NO
500	500	13	0.000000E+00	0.000000E+00	7.290000E-01	1.000000E+02	7.380000E+00	1.000000E+20	NO	NO
501	501	34	0.000000E+00	0.000000E+00	7.290000E-01	2.000000E+02	7.380000E+00	1.000000E+20	NO	NO
901	132	901	9.351900E+02	3.090000E+00	1.985000E+00	2.276703E+01	2.190232E+00	2.190232E+00	NO	NO
902	232	902	1.870380E+03	6.180000E+00	1.985000E+00	1.084863E+01	2.199976E+00	2.199976E+00	NO	NO
800	0	801	1.870880E+03	2.000000E+00	1.161500E+00	1.512000E-01	3.706445E+04	1.853222E+04	NO	NO
700	0	701	9.347442E+02	1.000000E+00	1.161500E+00	3.024000E-01	9.266112E+03	4.633056E+03	NO	NO
601	0	36	0.000000E+00	1.000000E+00	1.000000E+00	1.000000E+00	9.266112E+03	9.266112E+03	NO	NO
600	0	15	0.000000E+00	1.000000E+00	1.000000E+00	1.000000E+00	9.266112E+03	9.266112E+03	NO	NO
290	0	201	0.000000E+00	2.000000E+00	1.161500E+00	1.512000E-01	3.706445E+04	1.853222E+04	NO	NO
254	0	232	0.000000E+00	2.000000E+00	1.128400E+00	1.084000E+01	3.706445E+04	3.706445E+04	NO	NO
253	0	232	0.000000E+00	2.000000E+00	1.128400E+00	1.084000E+01	3.706445E+04	3.706445E+04	NO	NO
252	0	232	0.000000E+00	2.000000E+00	1.128400E+00	1.084000E+01	3.706445E+04	3.706445E+04	NO	NO
251	0	232	0.000000E+00	2.000000E+00	1.128400E+00	1.084000E+01	3.706445E+04	3.706445E+04	NO	NO
235	0	232	0.000000E+00	2.000000E+00	1.128400E+00	1.084000E+01	3.706445E+04	3.706445E+04	NO	NO
234	0	232	0.000000E+00	2.000000E+00	1.616000E-01	1.084000E+01	3.706445E+04	3.706445E+04	NO	NO
232	0	232	0.000000E+00	2.000000E+00	1.128400E+00	1.084000E+01	3.706445E+04	3.706445E+04	NO	NO
190	0	101	0.000000E+00	1.000000E+00	1.161500E+00	3.024000E-01	9.266112E+03	4.633056E+03	NO	NO
154	0	132	0.000000E+00	1.000000E+00	1.128400E+00	2.315000E+01	9.266112E+03	9.266112E+03	NO	NO
153	0	132	0.000000E+00	1.000000E+00	1.128400E+00	2.315000E+01	9.266112E+03	9.266112E+03	NO	NO
152	0	132	0.000000E+00	1.000000E+00	1.128400E+00	2.315000E+01	9.266112E+03	9.266112E+03	NO	NO
151	0	132	0.000000E+00	1.000000E+00	1.128400E+00	2.315000E+01	9.266112E+03	9.266112E+03	NO	NO
135	0	132	0.000000E+00	1.000000E+00	1.128400E+00	2.315000E+01	9.266112E+03	9.266112E+03	NO	NO
134	0	132	0.000000E+00	1.000000E+00	1.616000E-01	2.350200E+01	9.266112E+03	9.266112E+03	NO	NO
132	0	132	0.000000E+00	1.000000E+00	1.128400E+00	2.315000E+01	9.266112E+03	9.266112E+03	NO	NO
95	0	34	0.000000E+00	1.000000E+00	7.292000E-01	4.590000E-01	9.266112E+03	9.266112E+03	NO	NO
94	0	13	0.000000E+00	2.000000E+00	7.292000E-01	2.300000E-01	3.706445E+04	3.706445E+04	NO	NO
92	0	13	0.000000E+00	1.000000E+00	2.187000E-01	2.770000E-01	9.266112E+03	9.266112E+03	NO	NO

-3.268412E-01
 -3.284055E-01

CONDUCTOR DATA ACTUALLY BEING USED.

COND NUMB	* INPUT VALUES *		* CALC. VALUES *	
	AHTL	AHTR	AHTL	AHTR
1	0.000000E+00	1.422080E+04	0.000000E+00	1.422222E+04
2	0.000000E+00	1.422080E+04	0.000000E+00	1.422222E+04
3	0.000000E+00	1.422080E+04	0.000000E+00	1.422222E+04
16	0.000000E+00	2.960000E+02	0.000000E+00	2.960000E+02
17	0.000000E+00	2.736600E+03	0.000000E+00	2.736600E+03
18	0.000000E+00	2.736600E+03	0.000000E+00	2.736600E+03
19	0.000000E+00	4.380000E+02	0.000000E+00	4.380000E+02
20	0.000000E+00	3.534000E+02	0.000000E+00	3.534000E+02
21	0.000000E+00	2.560000E+02	0.000000E+00	2.560000E+02
22	0.000000E+00	2.424000E+02	0.000000E+00	2.424000E+02
23	0.000000E+00	2.424000E+02	0.000000E+00	2.424000E+02
24	0.000000E+00	2.424000E+02	0.000000E+00	2.424000E+02
25	0.000000E+00	2.777000E+02	0.000000E+00	2.777000E+02
26	0.000000E+00	1.480000E+02	0.000000E+00	1.480000E+02
27	0.000000E+00	1.368300E+03	0.000000E+00	1.368300E+03
28	0.000000E+00	1.368300E+03	0.000000E+00	1.368300E+03
29	0.000000E+00	2.190000E+02	0.000000E+00	2.190000E+02
30	0.000000E+00	1.767000E+02	0.000000E+00	1.767000E+02
31	0.000000E+00	1.280000E+02	0.000000E+00	1.280000E+02
32	0.000000E+00	1.212000E+02	0.000000E+00	1.212000E+02
33	0.000000E+00	1.212000E+02	0.000000E+00	1.212000E+02
34	0.000000E+00	1.212000E+02	0.000000E+00	1.212000E+02
35	0.000000E+00	2.432000E+02	0.000000E+00	2.432000E+02
4	1.149860E+04	1.296400E+04	1.182249E+04	1.334759E+04
5	1.395580E+04	1.573400E+04	1.434890E+04	1.619991E+04
6	1.395400E+04	1.573200E+04	1.434705E+04	1.619782E+04
9	1.149860E+04	1.296400E+04	1.182249E+04	1.334761E+04
8	1.395580E+04	1.573400E+04	1.434890E+04	1.619991E+04
7	1.395400E+04	1.573200E+04	1.434705E+04	1.619782E+04
10	5.749300E+03	6.482000E+03	5.912552E+03	6.675274E+03
11	6.977900E+03	7.867000E+03	7.176039E+03	8.101750E+03
12	6.977000E+03	7.866000E+03	7.175113E+03	8.100704E+03
15	5.749300E+03	6.482000E+03	5.912552E+03	6.675285E+03
14	6.977900E+03	7.867000E+03	7.176039E+03	8.101749E+03
13	6.977000E+03	7.866000E+03	7.175113E+03	8.100704E+03

AREA CHANGES ARE MADE TO BALANCE HEAT GENERATION AND REMOVAL RATES. THESE AREAS ARE ARTIFICIAL AREAS USED ONLY IN EVALUATING THE OVERALL HEAT TRANSFER COEFFICIENT AND ARE NOT USED IN THE CONDUCTION SOLUTION FOR GEOMETRY.

CONTROL DATA ACTUALLY BEING USED.

INPUT BLOCK	SIGNAL TYPE	SIGNAL REGION	SIGNAL GAIN	INITIAL OUTPUT
1	TEMP	2	1.00000E+00	6.04365E+02
2	TEMP	13	1.00000E+00	5.46831E+02
3	WP**	94	1.00000E+00	0.00000E+00
4	WP**	95	1.00000E+00	0.00000E+00
5	TEMP	23	1.00000E+00	6.04365E+02
6	TEMP	34	1.00000E+00	5.46831E+02
7	TRIP	19	1.00000E+00	0.00000E+00
8	TRIP	20	1.00000E+00	0.00000E+00
9	CONS	0	5.47200E+02	5.47200E+02
10	PRES	39	1.00000E+00	2.25000E+03
11	CONS	0	2.25000E+03	2.25000E+03
12	CONS	0	1.16200E+00	1.16200E+00
13	CONS	0	5.75460E+02	5.75460E+02

CONTROL DATA ACTUALLY BEING USED.

CONTROL BLOCK	BLOCK TYPE	INPUT 1	INPUT 2	BLOCK GAIN	INPUT 1 GAIN	INPUT 2 GAIN	MINIMUM OUTPUT	MAXIMUM OUTPUT	*INPUT VALUES* INITIAL OUTPUT	*CALC. VALUES* INITIAL OUTPUT	OUTPUT CNVRGD
-1	SUM	1	2	1.00000E+00	5.00000E-01	5.00000E-01	-1.00000E+75	1.00000E+75	5.75500E+02	5.75598E+02	NO
-2	SUM	3	4	1.00000E+00	1.00000E+00	1.00000E+00	-1.00000E+75	1.00000E+75	0.00000E+00	0.00000E+00	
-3	INT	-2	0	1.00000E+00	0.00000E+00	0.00000E+00	-1.00000E+75	1.00000E+75	0.00000E+00	0.00000E+00	
-4	SUM	5	6	1.00000E+00	5.00000E-01	5.00000E-01	-1.00000E+75	1.00000E+75	5.75500E+02	5.75598E+02	NO
-5	LLG	-4	0	1.00000E+00	2.50000E+01	5.00000E+00	-1.00000E+75	1.00000E+75	0.00000E+00	0.00000E+00	
-6	LLG	-1	0	1.00000E+00	2.50000E+01	5.00000E+00	-1.00000E+75	1.00000E+75	0.00000E+00	0.00000E+00	
-7	SUM	-5	9	1.00000E+00	1.00000E+00	-1.00000E+00	-1.00000E+75	1.00000E+75	2.85000E+01	-5.47200E+02	NO
-8	SUM	-6	9	1.00000E+00	1.00000E+00	-1.00000E+00	-1.00000E+75	1.00000E+75	2.85000E+01	-5.47200E+02	NO
-9	LAG	7	0	1.00000E+00	5.00000E-01	0.00000E+00	0.00000E+00	1.00000E+00	0.00000E+00	0.00000E+00	
-10	LAG	8	0	1.00000E+00	5.00000E-01	0.00000E+00	0.00000E+00	1.00000E+00	0.00000E+00	0.00000E+00	
-11	MUL	-9	-7	1.00000E+00	0.00000E+00	0.00000E+00	-1.00000E+75	1.00000E+75	0.00000E+00	0.00000E+00	
-12	MUL	-10	-8	1.00000E+00	0.00000E+00	0.00000E+00	-1.00000E+75	1.00000E+75	0.00000E+00	0.00000E+00	
-13	FNG	-11	3	1.00000E+00	0.00000E+00	0.00000E+00	-4.76010E+02	0.00000E+00	0.00000E+00	0.00000E+00	
-14	FNG	-12	4	1.00000E+00	0.00000E+00	0.00000E+00	-4.76010E+02	0.00000E+00	0.00000E+00	0.00000E+00	
-15	SUM	1	2	1.00000E+00	1.00000E+00	-1.00000E+00	-1.00000E+75	1.00000E+75	5.75000E+01	5.75339E+01	NO
-16	SUM	5	6	1.00000E+00	1.00000E+00	-1.00000E+00	-1.00000E+75	1.00000E+75	5.75000E+01	5.75339E+01	NO
-17	SUM	10	11	7.97800E-04	1.00000E+00	-1.00000E+00	-1.00000E+75	1.00000E+75	0.00000E+00	0.00000E+00	
-18	SUM	-1	13	1.00000E+00	1.00000E+00	-1.00000E+00	-1.00000E+75	1.00000E+75	0.00000E+00	1.37717E-01	NO
-19	SUM	-4	13	1.00000E+00	1.00000E+00	-1.00000E+00	-1.00000E+75	1.00000E+75	0.00000E+00	1.37935E-01	NO
-20	SUM	12	-17	1.00000E+00	1.00000E+00	1.00000E+00	-1.00000E+75	1.00000E+75	1.16200E+00	1.16200E+00	
-21	LLG	-18	0	1.03500E-02	2.07000E-01	3.00000E+00	-1.00000E+75	1.00000E+75	0.00000E+00	0.00000E+00	
-22	LLG	-19	0	1.03500E-02	2.07000E-01	3.00000E+00	-1.00000E+75	1.00000E+75	0.00000E+00	0.00000E+00	
-23	SUM	-20	-21	5.75000E+01	1.00000E+00	-1.00000E+00	-1.00000E+75	1.00000E+75	6.68000E+01	6.68150E+01	NO
-24	SUM	-20	-22	5.75000E+01	1.00000E+00	-1.00000E+00	-1.00000E+75	1.00000E+75	6.68000E+01	6.68150E+01	NO
-25	SUM	-15	-23	1.00000E+00	1.00000E+00	-1.00000E+00	-1.00000E+75	1.00000E+75	-9.30000E+00	-9.28114E+00	NO
-26	SUM	-16	-24	1.00000E+00	1.00000E+00	-1.00000E+00	-1.00000E+75	1.00000E+75	-9.30000E+00	-9.28105E+00	NO

***** WARNING - USER SUPPLIED INITIAL OUTPUT SHOULD BE SET EQUAL TO CALCULATED VALUE IF OUTPUT DID NOT CONVERGE.

STANDARD TIME STEP NUMBER = 0 ACTUAL TIME STEP NUMBER = 0 TIME = 0.000000E+00 SECONDS

	NORMALIZED CORE POWER	CORE POWER (MW)	THERMAL POWER (BTU/HR)	HEAT REMOV. RATE (BTU/HR)	ENERGY BALANCE (BTU)	WATER MASS BALANCE (LBM)	AIR MASS BALANCE (LBM)			
	1.000000E+00	2.300000E+03	7.891144E+09	0.000000E+00	4.117851E+08	8.921851E+05	3.306896E+03			
VOLUME NUMBER	AVG. PRES. (PSIA)	TOT. MASS (LB)	AVG. ENTH. (BTU/LB)	AVG. DEN. (LB/FT3)	AVG. TEMP. (DEG. F)	AVG. QUAL.	BUBB. MASS (LB)	MIX. LEV. (FT)	LIQ. MASS (LB)	
1	2.28152E+03	4.02949E+04	6.20386E+02	4.26853E+01	6.04463E+02	0.00000E+00	0.00000E+00	1.16700E+01	4.02949E+04	
2	2.25704E+03	8.14903E+03	6.20342E+02	4.26651E+01	6.04365E+02	0.00000E+00	0.00000E+00	3.59000E+00	8.14903E+03	
3	2.25802E+03	1.14636E+04	6.20383E+02	4.26633E+01	6.04396E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.14636E+04	
4	2.25129E+03	9.88033E+03	6.00275E+02	4.39517E+01	5.90269E+02	0.00000E+00	0.00000E+00	1.05400E+01	9.88033E+03	
5	2.24446E+03	1.01369E+04	5.81396E+02	4.50928E+01	5.76438E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.01369E+04	
7	2.23597E+03	2.08778E+04	5.57707E+02	4.64363E+01	5.58357E+02	0.00000E+00	0.00000E+00	9.40500E+00	2.08778E+04	
8	2.23388E+03	1.05497E+04	5.48587E+02	4.69293E+01	5.51194E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.05497E+04	
9	2.23387E+03	1.06217E+04	5.42544E+02	4.72495E+01	5.46390E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.06217E+04	
10	2.23561E+03	1.26960E+04	5.42561E+02	4.72497E+01	5.46406E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.26960E+04	
11	2.22702E+03	1.23405E+04	5.42543E+02	4.72455E+01	5.46376E+02	0.00000E+00	0.00000E+00	1.20500E+01	1.23405E+04	
12	2.27446E+03	1.81445E+04	5.42967E+02	4.72514E+01	5.46800E+02	0.00000E+00	0.00000E+00	5.19000E+00	1.81445E+04	
13	2.30898E+03	7.63947E+03	5.42927E+02	4.72739E+01	5.46831E+02	0.00000E+00	0.00000E+00	2.29000E+00	7.63947E+03	
14	2.30095E+03	8.69723E+03	5.42958E+02	4.72676E+01	5.46841E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69723E+03	
15	2.30080E+03	8.69711E+03	5.42969E+02	4.72669E+01	5.46850E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69711E+03	
16	2.30331E+03	8.69728E+03	5.42980E+02	4.72678E+01	5.46863E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69728E+03	
17	2.30191E+03	3.44096E+04	5.43000E+02	4.72659E+01	5.46876E+02	0.00000E+00	0.00000E+00	9.79000E+00	3.44096E+04	
18	2.29633E+03	7.58852E+03	5.69876E+02	4.57967E+01	5.67866E+02	0.00000E+00	0.00000E+00	4.02000E+00	7.58852E+03	
19	2.29205E+03	7.30605E+03	5.98560E+02	4.40920E+01	5.89140E+02	0.00000E+00	0.00000E+00	4.00000E+00	7.30605E+03	
20	2.28770E+03	7.04130E+03	6.23350E+02	4.24943E+01	6.06505E+02	0.00000E+00	0.00000E+00	4.10000E+00	7.04130E+03	
21	2.29762E+03	2.00872E+03	5.42987E+02	4.72641E+01	5.46858E+02	0.00000E+00	0.00000E+00	1.21000E+01	2.00872E+03	
22	2.27944E+03	2.42700E+04	5.42961E+02	4.72547E+01	5.46804E+02	0.00000E+00	0.00000E+00	7.67000E+00	2.42700E+04	
23	2.25714E+03	4.07452E+03	6.20342E+02	4.26651E+01	6.04365E+02	0.00000E+00	0.00000E+00	3.59000E+00	4.07452E+03	
24	2.25811E+03	5.73395E+03	6.20383E+02	4.26633E+01	6.04396E+02	0.00000E+00	0.00000E+00	5.91000E+00	5.73395E+03	
25	2.25138E+03	4.94019E+03	6.00273E+02	4.39518E+01	5.90268E+02	0.00000E+00	0.00000E+00	1.05400E+01	4.94019E+03	
26	2.24456E+03	5.06846E+03	5.81393E+02	4.50931E+01	5.76437E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.06846E+03	
28	2.23606E+03	1.04389E+04	5.57706E+02	4.64365E+01	5.58356E+02	0.00000E+00	0.00000E+00	9.40500E+00	1.04389E+04	
29	2.23398E+03	5.27487E+03	5.48587E+02	4.69294E+01	5.51193E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.27487E+03	
30	2.23396E+03	5.31085E+03	5.42544E+02	4.72496E+01	5.46390E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.31085E+03	
31	2.23570E+03	6.35036E+03	5.42561E+02	4.72497E+01	5.46406E+02	0.00000E+00	0.00000E+00	5.91000E+00	6.35036E+03	
32	2.22711E+03	6.17027E+03	5.42543E+02	4.72456E+01	5.46376E+02	0.00000E+00	0.00000E+00	1.20500E+01	6.17027E+03	
33	2.27456E+03	9.07228E+03	5.42967E+02	4.72515E+01	5.46800E+02	0.00000E+00	0.00000E+00	5.19000E+00	9.07228E+03	
34	2.30907E+03	3.81974E+03	5.42927E+02	4.72740E+01	5.46831E+02	0.00000E+00	0.00000E+00	2.29000E+00	3.81974E+03	
35	2.30105E+03	4.34389E+03	5.42958E+02	4.72676E+01	5.46841E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.34389E+03	
36	2.30090E+03	4.34383E+03	5.42969E+02	4.72669E+01	5.46850E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.34383E+03	
37	2.30341E+03	4.34392E+03	5.42980E+02	4.72679E+01	5.46863E+02	0.00000E+00	0.00000E+00	8.62000E+00	4.34392E+03	
39	LIQ REG VAP REG	2.25000E+03	2.85795E+04	7.01238E+02	3.66404E+01	6.54077E+02	0.00000E+00	0.00000E+00	2.18400E+01	
			3.25489E+03	1.11784E+03	6.25941E+00	6.54077E+02	1.00000E+00	3.25489E+03	2.18400E+01	
40		2.25594E+03	1.50179E+03	6.20337E+02	4.26644E+01	6.04358E+02	0.00000E+00	0.00000E+00	9.23000E+00	
101		8.30147E+02	1.03233E+05	5.47270E+02	2.18299E+01	5.22044E+02	4.71503E-02	2.41078E+03	3.82500E+01	
131		8.21226E+02	2.44849E+02	1.19831E+03	1.80036E+00	5.20793E+02	9.99268E-01	2.44670E+02	3.24200E+01	
132		8.04000E+02	8.04066E+02	1.19831E+03	1.76137E+00	5.18348E+02	9.98575E-01	8.02920E+02	1.36300E+01	
201		8.30094E+02	2.06430E+05	5.47270E+02	2.18260E+01	5.22037E+02	4.71627E-02	4.82272E+03	3.82500E+01	
231		8.21174E+02	4.89665E+02	1.19831E+03	1.80024E+00	5.20786E+02	9.99268E-01	4.89306E+02	3.24200E+01	
232		8.04000E+02	1.53239E+03	1.19831E+03	1.76137E+00	5.18348E+02	9.98578E-01	1.53021E+03	1.36300E+01	
500		6.14700E+02	1.11384E+05	4.80058E+01	4.51859E+01	8.00000E+01	1.01515E-05	0.00000E+00	1.23900E+01	
501		6.14700E+02	5.56918E+04	4.80058E+01	4.51859E+01	8.00000E+01	1.01515E-05	0.00000E+00	1.23900E+01	

701	8.36756E+02	6.08081E+03	4.17595E+02	5.22406E+01	4.38461E+02	0.00000E+00	0.00000E+00	2.00000E+00	6.08081E+03
801	8.36703E+02	1.21616E+04	4.17596E+02	5.22405E+01	4.38462E+02	0.00000E+00	0.00000E+00	2.00000E+00	1.21616E+04
900	1.47000E+01	6.44163E+04	1.18996E+03	3.30340E-02	3.00000E+02	1.00000E+00	6.44163E+04	0.00000E+00	0.00000E+00
901	7.89844E+02	1.74438E+00	1.20100E+03	1.72030E-02	5.16308E+02	9.97990E-01	1.74438E+00	1.36300E+01	0.00000E+00
902	7.89844E+02	3.48877E+00	1.20100E+03	1.72030E-02	5.16308E+02	9.97992E-01	3.48877E+00	1.36300E+01	0.00000E+00

JUNCTION NUMBER	CONNECTS VOLUMES	CHOKE MODE	JUN. FLOW (LB/SEC)	JUN. ENTH. (BTU/LB)	JUN. SPVL. (FT3/LB)	P R E S S U R E STAG. PSI	E L E V. PSI	D I F F E R E N T FRIC. PSI	I A L S ACCL. PSI	PUMP PSI
1	1 TO 2		1.87778E+04	6.20343E+02	2.34256E-02	1.43598E+01	1.33474E-01	-1.44933E+01	-1.97986E-11	0.00000E+00
2	2 TO 3		1.87778E+04	6.20341E+02	2.34387E-02	9.45078E+00	-9.36234E-01	-8.51455E+00	-2.09610E-13	0.00000E+00
3	3 TO 4		1.87778E+04	6.20372E+02	2.34394E-02	5.04207E+00	-2.48399E+00	-2.55808E+00	4.50712E-09	0.00000E+00
4	4 TO 5		1.87778E+04	6.00268E+02	2.27535E-02	6.92138E+00	-3.25878E+00	-3.66259E+00	-1.42482E-08	0.00000E+00
5	5 TO 7		1.87778E+04	5.81389E+02	2.21775E-02	8.60426E+00	-3.14618E+00	-5.45808E+00	9.98149E-09	0.00000E+00
7	7 TO 8		1.87778E+04	5.57713E+02	2.15356E-02	2.12468E+00	3.21298E+00	-5.33765E+00	2.01219E-08	0.00000E+00
8	8 TO 9		1.87778E+04	5.48594E+02	2.13088E-02	3.83792E-02	3.44668E+00	-3.48506E+00	7.05657E-09	0.00000E+00
9	9 TO 10		1.87778E+04	5.42551E+02	2.11644E-02	-1.17311E-01	2.69880E+00	-2.58149E+00	7.50400E-12	0.00000E+00
10	10 TO 11		1.87778E+04	5.42536E+02	2.11634E-02	1.39928E+00	2.47717E+00	-3.87645E+00	-6.06424E-11	0.00000E+00
11	11 TO 12		1.87778E+04	5.42543E+02	2.11661E-02	-4.22964E+01	-7.74408E-01	-2.01965E+00	-4.20154E-10	4.50904E+01
12	12 TO 13		1.87778E+04	5.42927E+02	2.11626E-02	-4.41792E+01	-4.72513E-01	-4.38712E-01	-4.82884E-10	4.50904E+01
13	13 TO 14		1.87778E+04	5.42927E+02	2.11534E-02	1.65012E+01	-5.41608E-01	-1.59596E+01	-2.37641E-11	0.00000E+00
14	14 TO 15		1.87440E+04	5.42964E+02	2.11560E-02	1.75924E+01	2.83275E+00	-3.00868E+00	-2.23512E-11	0.00000E+00
15	15 TO 16		1.87440E+04	5.42975E+02	2.11563E-02	-2.51267E-01	2.82948E+00	-3.16804E-01	-9.60051E-12	0.00000E+00
16	16 TO 17		1.87440E+04	5.42986E+02	2.11558E-02	4.26114E+00	1.97275E+00	-6.23389E+00	-2.25444E-11	0.00000E+00
17	17 TO 18		2.71302E+04	5.42991E+02	2.11571E-02	4.89172E+00	-2.24596E+00	-2.64576E+00	3.69127E-12	0.00000E+00
18	18 TO 19		2.71302E+04	5.69874E+02	2.18360E-02	4.20036E+00	-1.25164E+00	-2.94873E+00	1.13656E-11	0.00000E+00
19	19 TO 20		2.71302E+04	5.98557E+02	2.26803E-02	4.26773E+00	-1.21734E+00	-3.05039E+00	1.38505E-11	0.00000E+00
20	20 TO 1		2.71302E+04	6.23348E+02	2.35332E-02	6.94530E+00	-2.27544E+00	-4.66986E+00	4.68892E-12	0.00000E+00
21	21 TO 1		9.85800E+02	5.42975E+02	2.11581E-02	1.56611E+01	-3.65949E+00	-1.20016E+01	-2.77818E-11	0.00000E+00
22	22 TO 1		5.07000E+01	5.42965E+02	2.11618E-02	-2.68598E+00	2.69268E+00	-6.70002E-03	-2.44016E-11	0.00000E+00
23	23 TO 24		9.38890E+03	6.20341E+02	2.34386E-02	9.45076E+00	-9.36236E-01	-8.51453E+00	2.48690E-14	0.00000E+00
24	24 TO 25		9.38890E+03	6.20372E+02	2.34394E-02	5.04208E+00	-2.48400E+00	-2.55807E+00	4.47916E-09	0.00000E+00
25	25 TO 26		9.38890E+03	6.00266E+02	2.27534E-02	6.92138E+00	-3.25880E+00	-3.66258E+00	-1.39607E-08	0.00000E+00
26	26 TO 28		9.38890E+03	5.81387E+02	2.21774E-02	8.60425E+00	-3.14619E+00	-5.45806E+00	1.04330E-08	0.00000E+00
28	28 TO 29		9.38890E+03	5.57712E+02	2.15355E-02	2.12465E+00	3.21299E+00	-5.33764E+00	2.01003E-08	0.00000E+00
29	29 TO 30		9.38890E+03	5.48593E+02	2.13088E-02	3.83679E-02	3.44669E+00	-3.48506E+00	7.01968E-09	0.00000E+00
30	30 TO 31		9.38890E+03	5.42551E+02	2.11644E-02	-1.17317E-01	2.69881E+00	-2.58149E+00	7.59481E-12	0.00000E+00
31	31 TO 32		9.38890E+03	5.42536E+02	2.11634E-02	1.39927E+00	2.47717E+00	-3.87644E+00	-6.05771E-11	0.00000E+00
32	32 TO 33		9.38890E+03	5.42543E+02	2.11661E-02	-4.22965E+01	-7.74409E-01	-2.01965E+00	-4.20156E-10	4.50906E+01
33	33 TO 34		9.38890E+03	5.42927E+02	2.11626E-02	-4.41793E+01	-4.72514E-01	-4.38712E-01	-4.82912E-10	4.50906E+01
34	34 TO 35		9.38890E+03	5.42927E+02	2.11534E-02	1.65012E+01	-5.41608E-01	-1.59596E+01	-2.37037E-11	0.00000E+00
35	35 TO 36		9.37200E+03	5.42964E+02	2.11559E-02	1.75917E-01	2.83275E+00	-3.00867E+00	-2.23646E-11	0.00000E+00
36	36 TO 37		9.37200E+03	5.42975E+02	2.11562E-02	-2.51432E+00	2.83112E+00	-3.16803E-01	-9.54491E-12	0.00000E+00
37	37 TO 17		9.37200E+03	5.42986E+02	2.11558E-02	4.24917E+00	1.97111E+00	-6.22028E+00	-2.31646E-11	0.00000E+00
39	39 TO 40		0.00000E+00	7.01238E+02	2.72868E-02	-5.94321E+00	5.94321E+00	0.00000E+00	0.00000E+00	0.00000E+00
40	40 TO 23		0.00000E+00	6.20343E+02	2.34383E-02	-1.19401E+00	1.19401E+00	0.00000E+00	0.00000E+00	0.00000E+00
42	17 TO 21		9.85800E+02	5.42994E+02	2.11572E-02	4.77714E+00	-3.59246E+00	-1.18468E+00	2.43712E-11	0.00000E+00
43	1 TO 23		9.38890E+03	6.20343E+02	2.34256E-02	1.43654E+01	1.33473E-01	-1.44989E+01	-1.96050E-11	0.00000E+00
44	35 TO 22		1.69000E+01	5.42900E+02	2.11552E-02	2.83636E+01	-2.67487E+00	-2.56887E+01	-7.78790E-11	0.00000E+00
45	14 TO 22		3.38000E+01	5.42900E+02	2.11552E-02	2.82684E+01	-2.67487E+00	-2.55936E+01	-7.74421E-11	0.00000E+00
75	23 TO 900		0.00000E+00	6.20389E+02	2.34399E-02	0.00000E+00	1.54677E-01	0.00000E+00	0.00000E+00	0.00000E+00
100	701 TO 101		9.35190E+02	4.17596E+02	1.91423E-02	8.23617E+00	-5.98655E+00	-2.24962E+00	-4.19442E-13	0.00000E+00
101	101 TO 131		9.35190E+02	1.19855E+03	5.50677E-01	3.65316E+00	-1.64747E+00	-2.00570E+00	3.70304E-12	0.00000E+00
131	131 TO 132		9.35190E+02	1.19611E+03	5.53825E-01	1.69955E+01	2.86025E-01	-1.72815E+01	2.24532E-12	0.00000E+00
200	801 TO 201		1.87038E+03	4.17597E+02	1.91423E-02	8.23549E+00	-5.98581E+00	-2.24968E+00	-4.98712E-13	0.00000E+00
201	201 TO 231		1.87038E+03	1.19855E+03	5.50713E-01	3.65260E+00	-1.64677E+00	-2.00583E+00	3.65774E-12	0.00000E+00
231	231 TO 232		1.87038E+03	1.19612E+03	5.53863E-01	1.69438E+01	2.86011E-01	-1.72299E+01	2.25597E-12	0.00000E+00
500	500 TO 13		0.00000E+00	5.42974E+02	2.11544E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00
501	501 TO 34		0.00000E+00	5.42974E+02	2.11544E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00
901	132 TO 901		9.35190E+02	1.19829E+03	5.68495E-01	1.34527E+01	1.94381E-03	-1.34546E+01	-3.96350E-13	0.00000E+00
902	232 TO 902		1.87038E+03	1.19829E+03	5.68457E-01	1.34527E+01	1.94362E-03	-1.34546E+01	-3.38618E-13	0.00000E+00

800	0 TO 801	1.87088E+03	4.17579E+02	1.91441E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
700	0 TO 701	9.34744E+02	4.17579E+02	1.91440E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
601	0 TO 36	0.00000E+00	5.42982E+02	2.11567E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
600	0 TO 15	0.00000E+00	5.42982E+02	2.11568E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
290	0 TO 201	0.00000E+00	5.17237E+02	2.17700E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
254	0 TO 232	0.00000E+00	1.19888E+03	5.68133E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
253	0 TO 232	0.00000E+00	1.19888E+03	5.68133E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
252	0 TO 232	0.00000E+00	1.19888E+03	5.68133E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
251	0 TO 232	0.00000E+00	1.19888E+03	5.68133E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
235	0 TO 232	0.00000E+00	1.19888E+03	5.68133E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
234	0 TO 232	0.00000E+00	1.19888E+03	5.68133E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
232	0 TO 232	0.00000E+00	1.19888E+03	5.68133E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
190	0 TO 101	0.00000E+00	5.17246E+02	2.17696E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
154	0 TO 132	0.00000E+00	1.19888E+03	5.68131E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
153	0 TO 132	0.00000E+00	1.19888E+03	5.68131E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
152	0 TO 132	0.00000E+00	1.19888E+03	5.68131E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
151	0 TO 132	0.00000E+00	1.19888E+03	5.68131E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
135	0 TO 132	0.00000E+00	1.19888E+03	5.68131E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
134	0 TO 132	0.00000E+00	1.19888E+03	5.68131E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
132	0 TO 132	0.00000E+00	1.19888E+03	5.68131E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
95	0 TO 34	0.00000E+00	5.42972E+02	2.11544E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
94	0 TO 13	0.00000E+00	5.42972E+02	2.11545E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
92	0 TO 13	0.00000E+00	5.42974E+02	2.11544E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

PUMP NUMBER	VOLUME NUMBER	PUMP SPEED (RPM)	NORM. PUMP TORQUE	NORM. FRIC. TORQUE	NORM. MOT. TORQUE	POWER TO H2O (BTU/HR)
1	33	1.19000E+03	9.97561E-01	1.00000E+00	1.00000E+00	1.37479E+07
2	12	1.19000E+03	9.97559E-01	1.00000E+00	1.00000E+00	2.74957E+07

HEAT COND. NUMBER	VOL. NUM.	H.T. MODE	SURF. FLUX (BTU/HR-FT2)	CRIT. FLUX (BTU/HR-FT2)	H.T. COEF. (BTU/H-F2-F)	SURF. TEMP. (DEG. F)	MASS FLUX (LBM/HR-FT2)	STORD ENRGY (BTU)	POWR TO H2O (BTU/HR)
1	RIGHT 18	1	1.84648E+05	1.19235E+06	5.72837E+03	6.00100E+02	2.35801E+06	7.23050E+06	2.62611E+09
2	RIGHT 19	1	1.97017E+05	1.15766E+06	5.83990E+03	6.22876E+02	2.35801E+06	7.68589E+06	2.80202E+09
3	RIGHT 20	1	1.70281E+05	1.12975E+06	5.94333E+03	6.35156E+02	2.35801E+06	7.05712E+06	2.42177E+09
16	RIGHT 2	0	0.00000E+00	1.15168E+06	5.00000E+00	6.04365E+02	7.36384E+06	2.59328E+06	0.00000E+00
17	RIGHT 3	0	0.00000E+00	1.15106E+06	5.00000E+00	6.04396E+02	8.98459E+05	8.22283E+06	0.00000E+00
18	RIGHT 10	0	0.00000E+00	1.26819E+06	5.00000E+00	5.46406E+02	8.98459E+05	7.36861E+06	0.00000E+00
19	RIGHT 11	0	0.00000E+00	1.27345E+06	5.00000E+00	5.46376E+02	6.45039E+06	3.60621E+06	0.00000E+00
20	RIGHT 12	0	0.00000E+00	1.24334E+06	5.00000E+00	5.46800E+02	3.52084E+06	1.75118E+07	0.00000E+00
21	RIGHT 13	0	0.00000E+00	1.22100E+06	5.00000E+00	5.46831E+02	8.20389E+06	1.91579E+06	0.00000E+00
22	RIGHT 14	0	0.00000E+00	1.22624E+06	5.00000E+00	5.46841E+02	4.37824E+06	7.16016E+06	0.00000E+00
23	RIGHT 15	0	0.00000E+00	1.22632E+06	5.00000E+00	5.46850E+02	4.37036E+06	7.16029E+06	0.00000E+00
24	RIGHT 16	0	0.00000E+00	1.22466E+06	5.00000E+00	5.46863E+02	4.37036E+06	7.16048E+06	0.00000E+00
25	RIGHT 17	0	0.00000E+00	1.22555E+06	5.00000E+00	5.46876E+02	1.36118E+06	4.36586E+06	0.00000E+00
26	RIGHT 23	0	0.00000E+00	1.15162E+06	5.00000E+00	6.04365E+02	7.36384E+06	1.29664E+06	0.00000E+00
27	RIGHT 24	0	0.00000E+00	1.15100E+06	5.00000E+00	6.04396E+02	8.98459E+05	4.11142E+06	0.00000E+00
28	RIGHT 31	0	0.00000E+00	1.26813E+06	5.00000E+00	5.46406E+02	8.98459E+05	3.68431E+06	0.00000E+00
29	RIGHT 32	0	0.00000E+00	1.27339E+06	5.00000E+00	5.46376E+02	6.45039E+06	1.80310E+06	0.00000E+00
30	RIGHT 33	0	0.00000E+00	1.24328E+06	5.00000E+00	5.46800E+02	3.52084E+06	8.75590E+06	0.00000E+00
31	RIGHT 34	0	0.00000E+00	1.22094E+06	5.00000E+00	5.46831E+02	8.20389E+06	9.57898E+05	0.00000E+00
32	RIGHT 35	0	0.00000E+00	1.22617E+06	5.00000E+00	5.46841E+02	4.37824E+06	3.58008E+06	0.00000E+00
33	RIGHT 36	0	0.00000E+00	1.22626E+06	5.00000E+00	5.46850E+02	4.37036E+06	3.58014E+06	0.00000E+00
34	RIGHT 37	0	0.00000E+00	1.22459E+06	5.00000E+00	5.46863E+02	4.37036E+06	3.58024E+06	0.00000E+00
35	RIGHT 22	0	0.00000E+00	1.24017E+06	5.00000E+00	5.46804E+02	3.03542E+03	9.74428E+06	0.00000E+00
4	LEFT 4	1	-1.14876E+05	1.18020E+06	6.76682E+03	5.73292E+02	3.16776E+06		-1.35812E+09
	RIGHT 201	11	1.01751E+05	1.52746E+06	1.07929E+04	5.31465E+02	3.81105E+04	1.73758E+06	1.35812E+09
5	LEFT 5	1	-8.88788E+04	1.20897E+06	6.68130E+03	5.63136E+02	3.16776E+06		-1.27531E+09
	RIGHT 201	11	7.87234E+04	1.52746E+06	9.09598E+03	5.30692E+02	3.81105E+04	2.08799E+06	1.27531E+09
6	LEFT 7	1	-5.57789E+04	1.24649E+06	6.57800E+03	5.49877E+02	3.16776E+06		-8.00263E+08
	RIGHT 201	11	4.94056E+04	1.52746E+06	6.66752E+03	5.29447E+02	3.81105E+04	2.04278E+06	8.00263E+08

CONTEXT SAVE AT 0.00000 SECONDS STEP NO. 0

WRITTEN TO UNIT NUMBER 34

DATA RECORD NUMBER 1 WAS WRITTEN ON TAPE VSN = , DENSITY = PE, CREATED ON 90159
AND WAS LABELED RETRAN1

MINET, TIME= 1.00000 TIME STEP=0.03566 STEP NO. 17
 MINIMUM TIME CONSTANT= 5.238E-01 SEC, LIMIT KEY= 101

SYSTEM BOUNDARY CONDITIONS:

ID	NETWORK	FLOW(KG/S)	ENTHALPY(MJ/KG)	PRESSURE(MPA)	TEMP(K)	FLUID
413	1	848.469	2.787225	5.447174	542.090	H2O
412	1	1272.743	1.899121	3.892000	521.547	H2O
414	1	0.000	2.790901	4.892000	535.337	H2O
416	1	0.000	2.779057	5.000000	536.694	H2O
411	1	424.239	2.787221	5.447174	542.090	H2O
403	2	181.930	2.740000	4.230343	526.485	H2O
406	2	181.377	1.599534	4.200000	526.054	H2O
401	3	1272.610	0.808470	3.134080	463.120	H2O
402	3	424.077	0.971289	5.769146	498.800	H2O
404	3	848.691	0.971289	5.768792	498.800	H2O

SYSTEM VOLUMES

ID	PRESSURE(MPA)	ENTHALPY(MJ/KG)	TEMP(K)	LEVEL(RELATIVE)	HEAT INPUT(MJ/S)	NETWORK	REGIONS
111	5.445076	2.787237	542.066	0.000000	0.000000	1	1
112	5.167624	2.787253	538.758	0.000000	0.000000	1	1
101	5.989476	0.971289	498.793	0.000000	0.000000	3	1

SYSTEM SEGMENTS

SEG	NETWK	WIN(KG/S)	WOUT(KG/S)	WBAR(KG/S)	ALPHA IS IN MPA*SEC*SEC/KG/KG			POUT(MPA)	ALPHA,SEG	BETA(MPA)	CONNECTS TO:	
					EIN(MJ/KG)	EOUT(MJ/KG)	PIN(MPA)				IN	OUT
1	1	848.469	848.469	848.469	2.787225	2.787225	5.447174	5.445212	0.235E-08	-0.000272	413	111
2	1	1272.724	1272.729	1272.726	2.787239	2.787254	5.445076	5.167624	0.171E-06	-0.000001	111	112
3	1	1272.743	1272.743	1272.743	2.787253	1.899121	5.167624	3.892000	0.787E-06	0.000000	112	412
4	1	0.000	0.000	0.000	2.787253	2.790901	5.167753	4.892000	0.238E+09	0.000000	112	414
5	1	0.000	0.000	0.000	2.787245	2.779057	5.444940	5.000000	0.228E+09	-0.000392	111	416
6	1	424.239	424.239	424.239	2.787221	2.787221	5.447174	5.445212	0.939E-08	-0.000272	411	111
7	2	181.930	181.377	181.653	2.740000	1.599534	4.230343	4.200000	0.944E-06	0.000818	403	406
8	3	1272.610	1272.768	1272.694	0.808470	0.971296	3.134080	5.989476	0.214E-05	6.317969	401	101
9	3	424.077	424.077	424.077	0.971289	0.971289	5.989476	5.769146	0.137E-05	0.026170	101	402
10	3	848.692	848.691	848.691	0.971289	0.971289	5.989476	5.768792	0.343E-06	0.026170	101	404

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IN-SEGMENT DISTRIBUTIONS														
SEG	MODID	NODE	EIN(MJ/KG)	EBAR(MJ/KG)	EOUT(MJ/KG)	WIN(KG/S)	WOUT(KG/S)	TIN(K)	TBAR(K)	TOUT(K)	DENS(KG/M3)	QA(MJ/S)	JIN	JOUT
1	23	1	2.787225	2.787225	2.787225	848.469	848.469	542.079	542.079	542.079	27.715	0.000	1	2
2	22	2	2.787239	2.787242	2.787245	1272.724	1272.725	540.428	540.428	540.428	26.983	0.000	3	4
2	22	3	2.787245	2.787248	2.787250	1272.725	1272.726	540.428	540.428	540.428	26.982	0.000	4	5
2	22	4	2.787250	2.787252	2.787254	1272.726	1272.729	540.428	540.428	540.428	26.982	0.000	5	6
3	601	5	2.787253	2.343187	1.899121	1272.743	1272.743	530.612	530.612	530.612	30.978	-1130.364	7	8
4	502	6	2.787253	2.789077	2.790901	0.000	0.000	537.066	537.066	537.066	25.512	0.000	9	10
5	501	7	2.787245	2.783152	2.779057	0.000	0.000	539.423	539.423	539.423	26.609	0.000	11	12
6	21	8	2.787221	2.787221	2.787221	424.239	424.239	542.079	542.079	542.079	27.715	0.000	13	14
7	301	9	2.740000	2.169767	1.599534	181.930	181.377	526.270	526.270	526.270	33.154	-207.781	15	16
8	1	10	0.808470	0.808470	0.808470	1272.610	1272.610	462.949	462.949	462.949	876.723	0.000	17	18
8	201	11	0.808470	0.808470	0.808470	1272.610	1272.610	462.949	462.949	462.949	876.723	0.000	18	19
8	2	12	0.808470	0.808471	0.808471	1272.610	1272.609	462.949	462.949	462.949	876.723	0.000	19	20
8	301	13	0.808471	0.889933	0.971394	1272.609	1272.729	462.949	481.132	498.859	856.785	207.765	20	21
8	3	14	0.971394	0.971358	0.971323	1272.729	1272.758	498.859	498.851	498.844	835.635	0.000	21	22
8	3	15	0.971323	0.971310	0.971296	1272.758	1272.768	498.844	498.841	498.838	835.648	0.000	22	23
9	5	16	0.971289	0.971289	0.971289	424.077	424.077	498.797	498.797	498.797	836.932	0.000	24	25
9	5	17	0.971289	0.971289	0.971289	424.077	424.077	498.797	498.797	498.797	836.932	0.000	25	26
9	5	18	0.971289	0.971289	0.971289	424.077	424.077	498.797	498.797	498.797	836.932	0.000	26	27
10	4	19	0.971289	0.971289	0.971289	848.692	848.692	498.797	498.797	498.797	836.932	0.000	28	29
10	4	20	0.971289	0.971289	0.971289	848.692	848.691	498.797	498.797	498.797	836.932	0.000	29	30
10	4	21	0.971289	0.971289	0.971289	848.691	848.691	498.797	498.797	498.797	836.932	0.000	30	31

SYSTEM MODULES

MODULE 1 IS B.C. NUMBER 1, MODID 413,NPATH= 0
 MODULE 2 IS PIPE NUMBER 1, MODID 23,NPATH= 2
 MODULE 3 IS VOL. NUMBER 1, MODID 111,NPATH= 1
 MODULE 4 IS PIPE NUMBER 2, MODID 22,NPATH= 3
 MODULE 5 IS VOL. NUMBER 2, MODID 112,NPATH= 1
 MODULE 6 IS TBSG NUMBER 1, MODID 601,NPATH= 1
 SPEED IN RPM IS 1800.00, EFFICIENCY IS 0.40394, POWER FROM GEN -1.074E+09 J/S
 MODULE 7 IS B.C. NUMBER 2, MODID 412,NPATH= 0
 MODULE 8 IS VALV NUMBER 1, MODID 502,NPATH= 1
 RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.688E-04,AS DETERMINED USING OPTION 1
 MODULE 9 IS B.C. NUMBER 3, MODID 414,NPATH= 0
 MODULE 10 IS VALV NUMBER 2, MODID 501,NPATH= 1
 RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.727E-04,AS DETERMINED USING OPTION 1
 MODULE 11 IS B.C. NUMBER 4, MODID 416,NPATH= 0
 MODULE 12 IS B.C. NUMBER 5, MODID 411,NPATH= 0
 MODULE 13 IS PIPE NUMBER 3, MODID 21,NPATH= 1
 MODULE 14 IS B.C. NUMBER 6, MODID 403,NPATH= 0
 MODULE 15 IS H.X. NUMBER 1, MODID 301,NPATH= 1

THE HEAT FLUX AREA CORRECTION FACTOR IS 0.782411

T NOD	I NOD	O NOD	QINR(KJ/S/M)	TINR(K)	T TUBE(K)	TOUTR(K)	QOUTR(KJ/S/M)	MODE,I	MODE,O	T,CORE	T,STRC
1	13	9	9.98025	481.13193	493.27874	526.26992	-9.98147	1	6	481.1	526.3
MODULE 16	IS B.C. NUMBER	7,	MODID 406,NPATH=	0							
MODULE 17	IS B.C. NUMBER	8,	MODID 401,NPATH=	0							
MODULE 18	IS PIPE NUMBER	4,	MODID 1,NPATH=	1							
MODULE 19	IS PUMP NUMBER	1,	MODID 201,NPATH=	2							
PUMP SPEED= 3570.000 PUMP FLOW= 636.305 KG/S PUMP HEAD= 532.746 METERS											
MODULE 20	IS PIPE NUMBER	5,	MODID 2,NPATH=	1							
MODULE 21	IS PIPE NUMBER	6,	MODID 3,NPATH=	1							
MODULE 22	IS VOL. NUMBER	3,	MODID 101,NPATH=	1							
MODULE 23	IS PIPE NUMBER	7,	MODID 5,NPATH=	1							
MODULE 24	IS B.C. NUMBER	9,	MODID 402,NPATH=	0							
MODULE 25	IS PIPE NUMBER	8,	MODID 4,NPATH=	2							
MODULE 26	IS B.C. NUMBER	10,	MODID 404,NPATH=	0							

STANDARD TIME STEP NUMBER = 1 ACTUAL TIME STEP NUMBER = 17 TIME = 1.000000E+00 SECONDS

NORMALIZED CORE POWER	CORE POWER (MW)	THERMAL POWER (BTU/HR)	HEAT REMOV. RATE (BTU/HR)	ENERGY BALANCE (BTU)	WATER MASS BALANCE (LBM)	AIR MASS BALANCE (LBM)
1.000000E+00	2.300000E+03	7.891144E+09	0.000000E+00	4.117832E+08	8.921845E+05	3.306896E+03

VOLUME NUMBER	AVG. PRES. (PSIA)	TOT. MASS (LB)	AVG. ENTH. (BTU/LB)	AVG. DEN. (LB/FT3)	AVG. TEMP. (DEG. F)	AVG. QUAL.	BUBB. MASS (LB)	MIX. LEV. (FT)	LIQ. MASS (LB)
1	2.28152E+03	4.02949E+04	6.20386E+02	4.26853E+01	6.04462E+02	0.00000E+00	0.00000E+00	1.16700E+01	4.02949E+04
2	2.25704E+03	8.14903E+03	6.20342E+02	4.26651E+01	6.04365E+02	0.00000E+00	0.00000E+00	3.59000E+00	8.14903E+03
3	2.25801E+03	1.14636E+04	6.20383E+02	4.26632E+01	6.04396E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.14636E+04
4	2.25129E+03	9.88034E+03	6.00274E+02	4.39517E+01	5.90268E+02	0.00000E+00	0.00000E+00	1.05400E+01	9.88034E+03
5	2.24446E+03	1.01369E+04	5.81396E+02	4.50929E+01	5.76438E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.01369E+04
7	2.23596E+03	2.08778E+04	5.57707E+02	4.64363E+01	5.58357E+02	0.00000E+00	0.00000E+00	9.40500E+00	2.08778E+04
8	2.23388E+03	1.05497E+04	5.48587E+02	4.69294E+01	5.51193E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.05497E+04
9	2.23386E+03	1.06217E+04	5.42544E+02	4.72495E+01	5.46389E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.06217E+04
10	2.23561E+03	1.26960E+04	5.42561E+02	4.72497E+01	5.46406E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.26960E+04
11	2.22701E+03	1.23405E+04	5.42543E+02	4.72455E+01	5.46376E+02	0.00000E+00	0.00000E+00	1.20500E+01	1.23405E+04
12	2.27446E+03	1.81445E+04	5.42967E+02	4.72514E+01	5.46800E+02	0.00000E+00	0.00000E+00	5.19000E+00	1.81445E+04
13	2.30897E+03	7.63947E+03	5.42927E+02	4.72739E+01	5.46831E+02	0.00000E+00	0.00000E+00	2.29000E+00	7.63947E+03
14	2.30095E+03	8.69723E+03	5.42958E+02	4.72676E+01	5.46841E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69723E+03
15	2.30080E+03	8.69711E+03	5.42969E+02	4.72669E+01	5.46850E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69711E+03
16	2.30331E+03	8.69727E+03	5.42980E+02	4.72678E+01	5.46863E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69727E+03
17	2.30191E+03	3.44096E+04	5.43000E+02	4.72659E+01	5.46876E+02	0.00000E+00	0.00000E+00	9.79000E+00	3.44096E+04
18	2.29632E+03	7.58852E+03	5.69876E+02	4.57967E+01	5.67866E+02	0.00000E+00	0.00000E+00	4.02000E+00	7.58852E+03
19	2.29204E+03	7.30604E+03	5.98560E+02	4.40920E+01	5.89140E+02	0.00000E+00	0.00000E+00	4.00000E+00	7.30604E+03
20	2.28770E+03	7.04130E+03	6.23350E+02	4.24943E+01	6.06505E+02	0.00000E+00	0.00000E+00	4.10000E+00	7.04130E+03
21	2.29762E+03	2.00872E+03	5.42987E+02	4.72641E+01	5.46858E+02	0.00000E+00	0.00000E+00	1.21000E+01	2.00872E+03
22	2.27944E+03	2.42700E+04	5.42961E+02	4.72547E+01	5.46804E+02	0.00000E+00	0.00000E+00	7.67000E+00	2.42700E+04
23	2.25713E+03	4.07452E+03	6.20342E+02	4.26651E+01	6.04365E+02	0.00000E+00	0.00000E+00	3.59000E+00	4.07452E+03
24	2.25811E+03	5.73395E+03	6.20383E+02	4.26633E+01	6.04396E+02	0.00000E+00	0.00000E+00	5.91000E+00	5.73395E+03
25	2.25138E+03	4.94019E+03	6.00273E+02	4.39519E+01	5.90267E+02	0.00000E+00	0.00000E+00	1.05400E+01	4.94019E+03
26	2.24456E+03	5.06846E+03	5.81393E+02	4.50931E+01	5.76436E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.06846E+03
28	2.23606E+03	1.04389E+04	5.57705E+02	4.64365E+01	5.58356E+02	0.00000E+00	0.00000E+00	9.40500E+00	1.04389E+04
29	2.23397E+03	5.27487E+03	5.48586E+02	4.69295E+01	5.51193E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.27487E+03
30	2.23396E+03	5.31085E+03	5.42544E+02	4.72496E+01	5.46389E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.31085E+03
31	2.23570E+03	6.35036E+03	5.42561E+02	4.72497E+01	5.46406E+02	0.00000E+00	0.00000E+00	5.91000E+00	6.35036E+03
32	2.22711E+03	6.17027E+03	5.42543E+02	4.72456E+01	5.46376E+02	0.00000E+00	0.00000E+00	1.20500E+01	6.17027E+03
33	2.27456E+03	9.07228E+03	5.42967E+02	4.72515E+01	5.46800E+02	0.00000E+00	0.00000E+00	5.19000E+00	9.07228E+03
34	2.30907E+03	3.81974E+03	5.42927E+02	4.72740E+01	5.46831E+02	0.00000E+00	0.00000E+00	2.29000E+00	3.81974E+03
35	2.30105E+03	4.34389E+03	5.42958E+02	4.72676E+01	5.46841E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.34389E+03
36	2.30089E+03	4.34383E+03	5.42969E+02	4.72669E+01	5.46850E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.34383E+03
37	2.30341E+03	4.34392E+03	5.42980E+02	4.72679E+01	5.46863E+02	0.00000E+00	0.00000E+00	8.62000E+00	4.34392E+03
39	LIQ REG VAP REG	2.25000E+03	2.85795E+04	7.01238E+02	3.66404E+01	6.54077E+02	1.90373E-07	5.44077E-03	2.85795E+04
40		2.25594E+03	3.25489E+03	1.11784E+03	6.25941E+00	6.54077E+02	1.00000E+00	3.25489E+03	7.16221E-04
101		8.30137E+02	1.50178E+03	6.20338E+02	4.26643E+01	6.04359E+02	0.00000E+00	0.00000E+00	9.23000E+00
131		8.21215E+02	1.03233E+05	5.47268E+02	2.18297E+01	5.22043E+02	4.71504E-02	2.41101E+03	3.82515E+01
132		8.03986E+02	2.44845E+02	1.19831E+03	1.80033E+00	5.20792E+02	9.99268E-01	2.44666E+02	3.24200E+01
201		8.30084E+02	8.04051E+02	1.19831E+03	1.76134E+00	5.18346E+02	9.98575E-01	8.02905E+02	1.14599E+00
231		8.21162E+02	2.06430E+05	5.47268E+02	2.18259E+01	5.22036E+02	4.71623E-02	4.82314E+03	1.96694E+05
232		8.03985E+02	4.89657E+02	1.19831E+03	1.76133E+00	5.18346E+02	9.99268E-01	4.89299E+02	3.58340E-01
500		6.14694E+02	1.53236E+03	1.19831E+03	1.76133E+00	5.18346E+02	9.98577E-01	1.53018E+03	1.36300E+01
501		6.14694E+02	1.11384E+05	4.80058E+01	4.51859E+01	8.00000E+01	1.01516E-05	0.00000E+00	1.11383E+05
		6.14694E+02	5.56918E+04	4.80058E+01	4.51859E+01	8.00000E+01	1.01516E-05	0.00000E+00	5.56913E+04

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701	8.36744E+02	6.08104E+03	4.17544E+02	5.22426E+01	4.38415E+02	0.00000E+00	0.00000E+00	2.00000E+00	6.08104E+03
801	8.36692E+02	1.21621E+04	4.17546E+02	5.22425E+01	4.38417E+02	0.00000E+00	0.00000E+00	2.00000E+00	1.21621E+04
900	1.47000E+01	6.44163E+04	1.18996E+03	3.30340E-02	3.00000E+02	1.00000E+00	6.44163E+04	0.00000E+00	0.00000E+00
901	7.90046E+02	1.75413E+00	1.19829E+03	1.72991E+00	5.16338E+02	9.97998E-01	1.75062E+00	1.36300E+01	3.51242E-03
902	7.90046E+02	3.50826E+00	1.19829E+03	1.72991E+00	5.16338E+02	9.97998E-01	3.50124E+00	1.36300E+01	7.01637E-03

JUNCTION NUMBER	CONNECTS VOLUMES	CHOKE MODE	JUN. FLOW (LB/SEC)	JUN. ENTH. (BTU/LB)	JUN. SPVL. (FT3/LB)	P R E S S U R E D I F F E R E N T I A L S				
						STAG. PSI	ELEV. PSI	FRIC. PSI	ACCL. PSI	PUMP PSI
1	1 TO 2		1.87778E+04	6.20343E+02	2.34256E-02	1.43599E+01	1.33474E-01	-1.44934E+01	1.11075E-05	0.00000E+00
2	2 TO 3		1.87778E+04	6.20341E+02	2.34387E-02	9.45082E+00	-9.36234E-01	-8.51458E+00	9.19630E-06	0.00000E+00
3	3 TO 4		1.87778E+04	6.20371E+02	2.34394E-02	5.04209E+00	-2.48399E+00	-2.55809E+00	1.95544E-06	0.00000E+00
4	4 TO 5		1.87778E+04	6.00268E+02	2.27535E-02	6.92139E+00	-3.25878E+00	-3.66260E+00	3.34546E-06	0.00000E+00
5	5 TO 7		1.87778E+04	5.81389E+02	2.21775E-02	8.60427E+00	-3.14618E+00	-5.45809E+00	4.99623E-06	0.00000E+00
7	7 TO 8		1.87778E+04	5.57713E+02	2.15356E-02	2.12468E+00	3.21298E+00	-5.33766E+00	4.29543E-06	0.00000E+00
8	8 TO 9		1.87778E+04	5.48594E+02	2.13088E-02	3.83795E-02	3.44669E+00	-3.48506E+00	2.47631E-06	0.00000E+00
9	9 TO 10		1.87778E+04	5.42551E+02	2.11644E-02	-1.17313E-01	2.69880E+00	-2.58149E+00	1.03473E-06	0.00000E+00
10	10 TO 11		1.87778E+04	5.42536E+02	2.11634E-02	1.39927E+00	2.47717E+00	-3.87644E+00	8.84469E-07	0.00000E+00
11	11 TO 12		1.87778E+04	5.42543E+02	2.11661E-02	-4.22964E+01	-7.74408E-01	-2.01965E+00	5.85942E-08	4.50905E+01
12	12 TO 13		1.87778E+04	5.42927E+02	2.11626E-02	-4.41793E+01	-4.72513E-01	-4.38712E-01	-2.21283E-06	4.50905E+01
13	13 TO 14		1.87778E+04	5.42927E+02	2.11534E-02	1.65012E+01	-5.41608E-01	-1.59596E+01	-4.16838E-06	0.00000E+00
14	14 TO 15		1.87440E+04	5.42964E+02	2.11560E-02	1.75917E-01	2.83275E+00	-3.00867E+00	-1.93760E-06	0.00000E+00
15	15 TO 16		1.87440E+04	5.42975E+02	2.11563E-02	-2.51267E+00	2.82948E+00	-3.16803E-01	-2.26173E-06	0.00000E+00
16	16 TO 17		1.87440E+04	5.42986E+02	2.11558E-02	4.26112E+00	1.97275E+00	-6.23388E+00	-2.11612E-06	0.00000E+00
17	17 TO 18		2.71302E+04	5.42991E+02	2.11571E-02	4.89172E+00	-2.24596E+00	-2.64576E+00	-1.37789E-06	0.00000E+00
18	18 TO 19		2.71302E+04	5.69874E+02	2.18360E-02	4.20036E+00	-1.25164E+00	-2.94872E+00	-8.51332E-07	0.00000E+00
19	19 TO 20		2.71302E+04	5.98557E+02	2.26803E-02	4.26773E+00	-1.21734E+00	-3.05039E+00	-9.38133E-07	0.00000E+00
20	20 TO 1		2.71302E+04	6.23348E+02	2.35332E-02	6.94529E+00	-2.27544E+00	-4.66985E+00	-1.05409E-06	0.00000E+00
21	21 TO 1		9.85799E+02	5.42975E+02	2.11581E-02	1.56611E+01	-3.65949E+00	-1.20016E+01	-1.25491E-06	0.00000E+00
22	22 TO 1		5.06990E+01	5.42965E+02	2.11618E-02	-2.68598E+00	2.69268E+00	-6.69984E-03	-7.45315E-07	0.00000E+00
23	23 TO 24		9.38892E+03	6.20341E+02	2.34386E-02	9.45081E+00	-9.36236E-01	-8.51457E+00	9.89809E-06	0.00000E+00
24	24 TO 25		9.38892E+03	6.20371E+02	2.34394E-02	5.04209E+00	-2.48400E+00	-2.55809E+00	2.13087E-06	0.00000E+00
25	25 TO 26		9.38892E+03	6.00266E+02	2.27534E-02	6.92140E+00	-3.25880E+00	-3.66259E+00	3.75187E-06	0.00000E+00
26	26 TO 28		9.38892E+03	5.81386E+02	2.21774E-02	8.60427E+00	-3.14619E+00	-5.45807E+00	5.80042E-06	0.00000E+00
28	28 TO 29		9.38891E+03	5.57711E+02	2.15355E-02	2.12467E+00	3.21299E+00	-5.33765E+00	5.47784E-06	0.00000E+00
29	29 TO 30		9.38891E+03	5.48593E+02	2.13087E-02	3.83725E-02	3.44669E+00	-3.48506E+00	3.40388E-06	0.00000E+00
30	30 TO 31		9.38890E+03	5.42551E+02	2.11644E-02	-1.17316E-01	2.69881E+00	-2.58149E+00	1.65635E-06	0.00000E+00
31	31 TO 32		9.38890E+03	5.42536E+02	2.11634E-02	1.39927E+00	2.47717E+00	-3.87644E+00	3.85683E-06	0.00000E+00
32	32 TO 33		9.38890E+03	5.42543E+02	2.11661E-02	-4.22965E+01	-7.74409E-01	-2.01965E+00	2.05160E-06	4.50906E+01
33	33 TO 34		9.38890E+03	5.42927E+02	2.11626E-02	-4.41793E+01	-4.72514E-01	-4.38712E-01	-2.92523E-07	4.50906E+01
34	34 TO 35		9.38890E+03	5.42927E+02	2.11534E-02	1.65012E+01	-5.41608E-01	-1.59596E+01	-5.81524E-07	0.00000E+00
35	35 TO 36		9.37200E+03	5.42964E+02	2.11559E-02	1.75915E-01	2.83275E+00	-3.00867E+00	-5.30311E-07	0.00000E+00
36	36 TO 37		9.37200E+03	5.42975E+02	2.11562E-02	-2.51432E+00	2.83112E+00	-3.16803E-01	-8.49448E-07	0.00000E+00
37	37 TO 17		9.37200E+03	5.42986E+02	2.11558E-02	4.24916E+00	1.97111E+00	-6.22028E+00	-9.52905E-07	0.00000E+00
39	39 TO 40		7.47517E-02	7.01237E+02	2.72868E-02	-5.94193E+00	5.94320E+00	-1.31534E-07	1.26749E-03	0.00000E+00
40	40 TO 23		8.41242E-02	6.20344E+02	2.34383E-02	-1.19254E+00	1.19400E+00	-7.28492E-08	1.46711E-03	0.00000E+00
42	17 TO 21		9.85799E+02	5.42994E+02	2.11572E-02	4.77714E+00	-3.59246E+00	-1.18467E+00	-1.08772E-06	0.00000E+00
43	1 TO 23		9.38884E+03	6.20343E+02	2.34256E-02	1.43651E+01	1.33473E-01	-1.44987E+01	-6.17265E-05	0.00000E+00
44	35 TO 22		1.69000E+01	5.42900E+02	2.11552E-02	2.83636E+01	-2.67487E+00	-2.56887E+01	-8.68572E-07	0.00000E+00
45	14 TO 22		3.38000E+01	5.42900E+02	2.11552E-02	2.82684E+01	-2.67487E+00	-2.55935E+01	-8.37241E-07	0.00000E+00
75	23 TO 900		0.00000E+00	6.20389E+02	2.34399E-02	0.00000E+00	1.54677E-01	0.00000E+00	0.00000E+00	0.00000E+00
100	701 TO 101		9.34717E+02	4.17547E+02	1.91416E-02	8.23231E+00	-5.98644E+00	-2.24728E+00	-1.40133E-03	0.00000E+00
101	101 TO 131		9.35270E+02	1.19855E+03	5.50683E-01	3.65347E+00	-1.64752E+00	-2.00606E+00	-1.00744E-04	0.00000E+00
131	131 TO 132		9.35271E+02	1.19611E+03	5.53833E-01	1.69983E+01	2.86020E-01	-1.72847E+01	-3.78402E-04	0.00000E+00
200	801 TO 201		1.87062E+03	4.17549E+02	1.91416E-02	8.23674E+00	-5.98572E+00	-2.25016E+00	8.61503E-04	0.00000E+00
201	201 TO 231		1.87052E+03	1.19855E+03	5.50721E-01	3.65282E+00	-1.64684E+00	-2.00615E+00	-1.71003E-04	0.00000E+00
231	231 TO 232		1.87052E+03	1.19612E+03	5.53871E-01	1.69460E+01	2.86006E-01	-1.72327E+01	-6.70235E-04	0.00000E+00
500	500 TO 13		0.00000E+00	5.42974E+02	2.11544E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00
501	501 TO 34		0.00000E+00	5.42974E+02	2.11544E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00
901	132 TO 901		9.35286E+02	1.19829E+03	5.68506E-01	1.34568E+01	1.48720E-03	-1.34576E+01	6.28134E-04	0.00000E+00
902	232 TO 902		1.87055E+03	1.19829E+03	5.68468E-01	1.34564E+01	1.48717E-03	-1.34574E+01	4.65395E-04	0.00000E+00

800	0 TO 801	1.87104E+03	4.17252E+02	1.91373E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
700	0 TO 701	9.34929E+02	4.17251E+02	1.91373E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
601	0 TO 36	0.00000E+00	5.42982E+02	2.11567E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
600	0 TO 15	0.00000E+00	5.42982E+02	2.11568E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
290	0 TO 201	0.00000E+00	5.17235E+02	2.17701E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
254	0 TO 232	0.00000E+00	1.19888E+03	5.68143E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
253	0 TO 232	0.00000E+00	1.19888E+03	5.68143E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
252	0 TO 232	0.00000E+00	1.19888E+03	5.68143E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
251	0 TO 232	0.00000E+00	1.19888E+03	5.68143E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
235	0 TO 232	0.00000E+00	1.19888E+03	5.68143E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
234	0 TO 232	0.00000E+00	1.19888E+03	5.68143E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
232	0 TO 232	0.00000E+00	1.19840E+03	5.90342E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
190	0 TO 101	0.00000E+00	5.17244E+02	2.17697E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
154	0 TO 132	0.00000E+00	1.19888E+03	5.68142E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
153	0 TO 132	0.00000E+00	1.19888E+03	5.68142E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
152	0 TO 132	0.00000E+00	1.19888E+03	5.68142E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
151	0 TO 132	0.00000E+00	1.19888E+03	5.68142E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
135	0 TO 132	0.00000E+00	1.19888E+03	5.68142E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
134	0 TO 132	0.00000E+00	1.19888E+03	5.68142E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
132	0 TO 132	0.00000E+00	1.19840E+03	5.90342E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
95	0 TO 34	0.00000E+00	5.42972E+02	2.11544E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
94	0 TO 13	0.00000E+00	5.42972E+02	2.11545E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
92	0 TO 13	0.00000E+00	5.42973E+02	2.11544E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

PUMP NUMBER	VOLUME NUMBER	PUMP SPEED (RPM)	NORM. PUMP TORQUE	NORM. FRIC. TORQUE	NORM. MOT. TORQUE	POWER TO H2O (BTU/HR)
1	33	1.19000E+03	9.97561E-01	1.00000E+00	0.00000E+00	1.37479E+07
2	12	1.19000E+03	9.97559E-01	1.00000E+00	0.00000E+00	2.74957E+07

HEAT COND. NUMBER	VOL. NUM.	H.T. MODE	SURF. FLUX (BTU/HR-FT2)	CRIT. FLUX (BTU/HR-FT2)	H.T. COEF. (BTU/H-F2-F)	SURF. TEMP. (DEG. F)	MASS FLUX (LBM/HR-FT2)	STORD ENRGY (BTU)	POWR TO H2O (BTU/HR)
1	RIGHT 18	1	1.84648E+05	1.19235E+06	5.72837E+03	6.00100E+02	2.35801E+06	7.23050E+06	2.62611E+09
2	RIGHT 19	1	1.97017E+05	1.15766E+06	5.83990E+03	6.22876E+02	2.35801E+06	7.68589E+06	2.80202E+09
3	RIGHT 20	1	1.70281E+05	1.12975E+06	5.94333E+03	6.35156E+02	2.35801E+06	7.05712E+06	2.42177E+09
16	RIGHT 2	1	9.34610E-02	1.15168E+06	6.52950E+03	6.04365E+02	7.36386E+06	2.59328E+06	2.76645E+01
17	RIGHT 3	1	1.75516E-02	1.15106E+06	1.01191E+03	6.04396E+02	8.98461E+05	8.22283E+06	4.80316E+01
18	RIGHT 10	1	8.25706E-02	1.26819E+06	9.60271E+02	5.46406E+02	8.98459E+05	7.36861E+06	2.25963E+02
19	RIGHT 11	1	1.71000E-01	1.27345E+06	5.50280E+03	5.46376E+02	6.45038E+06	3.60621E+06	7.48980E+01
20	RIGHT 12	1	5.71461E-02	1.24334E+06	3.18977E+03	5.46800E+02	3.52083E+06	1.75118E+07	2.01954E+01
21	RIGHT 13	1	8.16447E-02	1.22100E+06	6.82997E+03	5.46831E+02	8.20389E+06	1.91579E+06	2.09010E+01
22	RIGHT 14	1	8.11224E-02	1.22624E+06	5.19015E+03	5.46841E+02	4.37824E+06	7.16016E+06	1.96641E+01
23	RIGHT 15	1	8.06246E-02	1.22632E+06	5.18272E+03	5.46850E+02	4.37036E+06	7.16029E+06	1.95434E+01
24	RIGHT 16	1	8.04764E-02	1.22466E+06	5.18269E+03	5.46863E+02	4.37036E+06	7.16048E+06	1.95075E+01
25	RIGHT 17	1	3.29702E-02	1.22555E+06	2.06937E+03	5.46876E+02	1.36118E+06	4.36586E+06	9.15583E+00
26	RIGHT 23	1	9.23472E-02	1.15162E+06	6.52950E+03	6.04365E+02	7.36386E+06	1.29664E+06	1.36674E+01
27	RIGHT 24	1	1.70112E-02	1.15100E+06	1.01191E+03	6.04396E+02	8.98461E+05	4.11142E+06	2.32764E+01
28	RIGHT 31	1	7.78013E-02	1.26813E+06	9.60271E+02	5.46406E+02	8.98459E+05	3.68431E+06	1.06456E+02
29	RIGHT 32	1	1.63716E-01	1.27339E+06	5.50280E+03	5.46376E+02	6.45039E+06	1.80310E+06	3.58537E+01
30	RIGHT 33	1	5.60603E-02	1.24328E+06	3.18977E+03	5.46800E+02	3.52084E+06	8.75590E+06	9.90586E+00
31	RIGHT 34	1	8.09705E-02	1.22094E+06	6.82997E+03	5.46831E+02	8.20389E+06	9.57898E+05	1.03642E+01
32	RIGHT 35	1	8.07025E-02	1.22618E+06	5.19015E+03	5.46841E+02	4.37824E+06	3.58008E+06	9.78115E+00
33	RIGHT 36	1	8.04243E-02	1.22626E+06	5.18272E+03	5.46850E+02	4.37036E+06	3.58014E+06	9.74742E+00
34	RIGHT 37	1	8.03736E-02	1.22460E+06	5.18269E+03	5.46863E+02	4.37036E+06	3.58024E+06	9.74128E+00
35	RIGHT 22	1	1.95695E-04	1.24017E+06	1.16854E+01	5.46804E+02	3.03540E+03	9.74428E+06	4.75930E-02
4	LEFT 4	1	-1.14879E+05	1.18020E+06	6.76683E+03	5.73292E+02	3.16777E+06		-1.35815E+09
	RIGHT 201	11	1.01753E+05	1.52746E+06	1.07930E+04	5.31463E+02	3.81143E+04	1.73758E+06	1.35816E+09
5	LEFT 5	1	-8.88807E+04	1.20898E+06	6.68131E+03	5.63135E+02	3.16777E+06		-1.27534E+09
	RIGHT 201	11	7.87258E+04	1.52746E+06	9.09613E+03	5.30690E+02	3.81143E+04	2.08798E+06	1.27535E+09
6	LEFT 7	1	-5.57807E+04	1.24649E+06	6.57800E+03	5.49877E+02	3.16777E+06		-8.00289E+08
	RIGHT 201	11	4.94079E+04	1.52746E+06	6.66770E+03	5.29446E+02	3.81143E+04	2.04277E+06	8.00300E+08

9	LEFT	9	1	-3.46328E+04	1.26928E+06	6.51298E+03	5.41072E+02	3.16776E+06		-4.09446E+08
	RIGHT	201	11	3.06764E+04	1.52746E+06	4.85268E+03	5.28357E+02	3.81143E+04	1.67881E+06	4.09456E+08
8	LEFT	8	1	-4.30276E+04	1.26063E+06	6.53886E+03	5.44613E+02	3.16776E+06		-6.17398E+08
	RIGHT	201	11	3.81119E+04	1.52746E+06	5.60815E+03	5.28831E+02	3.81143E+04	2.04684E+06	6.17410E+08
7	LEFT	7	1	-5.57807E+04	1.24649E+06	6.57800E+03	5.49877E+02	3.16777E+06		-8.00289E+08
	RIGHT	201	11	4.94079E+04	1.52746E+06	6.66770E+03	5.29446E+02	3.81143E+04	2.04277E+06	8.00300E+08
10	LEFT	25	1	-1.14863E+05	1.18015E+06	6.76682E+03	5.73293E+02	3.16777E+06		-6.79135E+08
	RIGHT	101	11	1.01739E+05	1.52747E+06	1.07923E+04	5.31470E+02	3.81026E+04	8.68798E+05	6.79138E+08
11	LEFT	26	1	-8.88644E+04	1.20892E+06	6.68130E+03	5.63136E+02	3.16777E+06		-6.37694E+08
	RIGHT	101	11	7.87111E+04	1.52747E+06	9.09516E+03	5.30697E+02	3.81026E+04	1.04400E+06	6.37698E+08
12	LEFT	28	1	-5.57659E+04	1.24644E+06	6.57799E+03	5.49878E+02	3.16777E+06		-4.00127E+08
	RIGHT	101	11	4.93946E+04	1.52747E+06	6.66662E+03	5.29452E+02	3.81026E+04	1.02139E+06	4.00131E+08
15	LEFT	30	1	-3.46206E+04	1.26922E+06	6.51298E+03	5.41074E+02	3.16776E+06		-2.04696E+08
	RIGHT	101	11	3.06653E+04	1.52747E+06	4.85159E+03	5.28364E+02	3.81026E+04	8.39412E+05	2.04700E+08
14	LEFT	29	1	-4.30141E+04	1.26057E+06	6.53885E+03	5.44615E+02	3.16777E+06		-3.08671E+08
	RIGHT	101	11	3.80998E+04	1.52747E+06	5.60705E+03	5.28838E+02	3.81026E+04	1.02343E+06	3.08675E+08
13	LEFT	28	1	-5.57659E+04	1.24644E+06	6.57799E+03	5.49878E+02	3.16777E+06		-4.00127E+08
	RIGHT	101	11	4.93946E+04	1.52747E+06	6.66662E+03	5.29452E+02	3.81026E+04	1.02139E+06	4.00131E+08
CORE NUMBER	SECT. NUMBER	HEAT COND. NUMBER		DEPTH REAC. EXT. ZR-H20 (FT)	DEPTH REAC. INT. ZR-H20 (FT)	HEAT GEN. ZR-H20 (BTU/HR)	COND. HEATING RATE (BTU/HR)	DIR. MODERATOR HT RT (BTU/HR)	AVG. METAL TEMPERATURE (DEG. F)	CENTERLINE TEMPERATURE (DEG. F)
1		1		0.00000E+00	0.00000E+00	0.00000E+00	2.62611E+09	0.00000E+00	1.52207E+03	1.99764E+03
2		2		0.00000E+00	0.00000E+00	0.00000E+00	2.80202E+09	0.00000E+00	1.61303E+03	2.14152E+03
3		3		0.00000E+00	0.00000E+00	0.00000E+00	2.42177E+09	0.00000E+00	1.47730E+03	1.90598E+03

CONTEXT SAVE AT 1.00000 SECONDS STEP NO. 17

WRITTEN TO UNIT NUMBER 34

DATA RECORD NUMBER 2 WAS WRITTEN ON TAPE VSN = , DENSITY = PE, CREATED ON 90159
AND WAS LABELED RETRAN1

TIMING EDIT ACCUMULATED TIME = 2.604 SECONDS

SUBROUTINE	CPU TIME (SEC)	PERCENT	NUMBER OF CALLS
* STSTAT	2.604	100.00	1
* ENERGY	2.604	100.00	86

* INDICATES OUTER LOOP TIME

TIME STEP CONTROL SUMMARY FOR 17 ACTUAL TIME STEPS. THE AVERAGE TIME STEP SIZE FOR THE INTERVAL WAS 5.882353E-02 SECONDS.

NUMBER OF TIMES EACH TEST CONTROLLED TIME STEP SIZE

UPPER LIMIT	LOWER LIMIT	PRESSURE CHANGE	MASS CHANGE	ENERGY CHANGE	COURANT LIMIT	SAT LINE CROSSING	AIR MASS CHANGE	ZERO FLOW CROSSING	TRIP ACTUATION
0	0	0	0	0	13	0	0	0	1

VOLUMES CONTROLLING COURANT LIMIT
 (VOLUME INDEX ; TIMES CONTROLLING)

20; 13

TRIP ID(S) CONTROLLING TIME STEP
 (TRIP ID ; TIMES CONTROLLING)

15; 1

MINET, TIME= 2.00000 TIME STEP=0.06566 STEP NO. 30
 MINIMUM TIME CONSTANT= 5.238E-01 SEC, LIMIT KEY= 101

SYSTEM BOUNDARY CONDITIONS:

ID	NETWORK	FLOW(KG/S)	ENTHALPY(MJ/KG)	PRESSURE(MPA)	TEMP(K)	FLUID
413	1	848.477	2.787225	5.447126	542.090	H2O
412	1	1272.727	1.899159	3.892000	521.547	H2O
414	1	0.000	2.790900	4.892000	535.337	H2O
416	1	0.000	2.779056	5.000000	536.694	H2O
411	1	424.251	2.787221	5.447126	542.090	H2O
403	2	181.930	2.740000	4.230371	526.485	H2O
406	2	181.685	1.598858	4.200000	526.054	H2O
401	3	1272.610	0.808470	3.134014	463.120	H2O
402	3	424.047	0.971289	5.769131	498.800	H2O
404	3	848.718	0.971289	5.768758	498.800	H2O

SYSTEM VOLUMES

ID	PRESSURE(MPA)	ENTHALPY(MJ/KG)	TEMP(K)	LEVEL(RELATIVE)	HEAT INPUT(MJ/S)	NETWORK	REGIONS
111	5.445028	2.787226	542.065	0.000000	0.000000	1	1
112	5.167573	2.787242	538.758	0.000000	0.000000	1	1
101	5.989448	0.971290	498.794	0.000000	0.000000	3	1

SYSTEM SEGMENTS

SEG	NETWK	WIN(KG/S)	WOUT(KG/S)	WBAR(KG/S)	ALPHA IS IN MPA*SEC*SEC/KG/KG			POUT(MPA)	ALPHA, SEG	BETA(MPA)	CONNECTS TO:	
					EIN(MJ/KG)	EOUT(MJ/KG)	PIN(MPA)				IN	OUT
1	1	848.477	848.477	848.477	2.787225	2.787225	5.447126	5.445164	0.235E-08	-0.000272	413	111
2	1	1272.731	1272.730	1272.730	2.787227	2.787233	5.445028	5.167573	0.171E-06	0.000000	111	112
3	1	1272.727	1272.727	1272.727	2.787243	1.899159	5.167573	3.892000	0.787E-06	0.000000	112	412
4	1	0.000	0.000	0.000	2.787243	2.790900	5.167702	4.892000	0.238E+09	0.000000	112	414
5	1	0.000	0.000	0.000	2.787227	2.779056	5.444892	5.000000	0.228E+09	-0.000392	111	416
6	1	424.251	424.251	424.251	2.787221	2.787221	5.447126	5.445164	0.939E-08	-0.000272	411	111
7	2	181.930	181.685	181.808	2.740000	1.598858	4.230371	4.200000	0.944E-06	0.000818	403	406
8	3	1272.610	1272.745	1272.673	0.808470	0.971337	3.134014	5.989448	0.214E-05	6.317969	401	101
9	3	424.047	424.047	424.047	0.971290	0.971289	5.989448	5.769131	0.137E-05	0.026170	101	402
10	3	848.718	848.718	848.718	0.971290	0.971289	5.989448	5.768758	0.343E-06	0.026170	101	404

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IN-SEGMENT DISTRIBUTIONS														
SEG	MODID	NODE	EIN(MJ/KG)	EBAR(MJ/KG)	EOUT(MJ/KG)	WIN(KG/S)	WOUT(KG/S)	TIN(K)	TBAR(K)	TOUT(K)	DENS(KG/M3)	QA(MJ/S)	JIN	JOUT
1	23	1	2.787225	2.787225	2.787225	848.477	848.477	542.078	542.078	542.078	27.715	0.000	1	2
2	22	2	2.787227	2.787227	2.787228	1272.731	1272.731	540.428	540.428	540.428	26.983	0.000	3	4
2	22	3	2.787228	2.787229	2.787230	1272.731	1272.730	540.428	540.428	540.428	26.982	0.000	4	5
2	22	4	2.787230	2.787232	2.787233	1272.730	1272.730	540.428	540.428	540.428	26.982	0.000	5	6
3	601	5	2.787243	2.343201	1.899159	1272.727	1272.727	530.612	530.612	530.612	30.978	-1130.288	7	8
4	502	6	2.787243	2.789071	2.790900	0.000	0.000	537.066	537.066	537.066	25.512	0.000	9	10
5	501	7	2.787227	2.783141	2.779056	0.000	0.000	539.422	539.422	539.422	26.609	0.000	11	12
6	21	8	2.787221	2.787221	2.787221	424.251	424.251	542.078	542.078	542.078	27.715	0.000	13	14
7	301	9	2.740000	2.169429	1.598858	181.930	181.685	526.270	526.270	526.270	33.165	-207.739	15	16
8	1	10	0.808470	0.808470	0.808470	1272.610	1272.610	462.949	462.949	462.949	876.723	0.000	17	18
8	201	11	0.808470	0.808470	0.808470	1272.610	1272.610	462.949	462.949	462.949	876.723	0.000	18	19
8	2	12	0.808470	0.808470	0.808471	1272.610	1272.610	462.949	462.949	462.949	876.723	0.000	19	20
8	301	13	0.808471	0.889975	0.971480	1272.610	1272.686	462.949	481.141	498.877	856.774	207.723	20	21
8	3	14	0.971480	0.971438	0.971396	1272.686	1272.721	498.877	498.868	498.859	835.614	0.000	21	22
8	3	15	0.971396	0.971366	0.971337	1272.721	1272.745	498.859	498.853	498.847	835.633	0.000	22	23
9	5	16	0.971290	0.971290	0.971289	424.047	424.047	498.797	498.797	498.797	836.932	0.000	24	25
9	5	17	0.971289	0.971289	0.971289	424.047	424.047	498.797	498.797	498.797	836.932	0.000	25	26
9	5	18	0.971289	0.971289	0.971289	424.047	424.047	498.797	498.797	498.797	836.932	0.000	26	27
10	4	19	0.971290	0.971290	0.971289	848.718	848.718	498.797	498.797	498.797	836.932	0.000	28	29
10	4	20	0.971289	0.971289	0.971289	848.718	848.718	498.797	498.797	498.797	836.932	0.000	29	30
10	4	21	0.971289	0.971289	0.971289	848.718	848.718	498.797	498.797	498.797	836.932	0.000	30	31

SYSTEM MODULES

MODULE 1 IS B.C. NUMBER 1, MODID 413,NPATH= 0
 MODULE 2 IS PIPE NUMBER 1, MODID 23,NPATH= 2
 MODULE 3 IS VOL. NUMBER 1, MODID 111,NPATH= 1
 MODULE 4 IS PIPE NUMBER 2, MODID 22,NPATH= 3
 MODULE 5 IS VOL. NUMBER 2, MODID 112,NPATH= 1
 MODULE 6 IS TBSG NUMBER 1, MODID 601,NPATH= 1
 SPEED IN RPM IS 1800.00, EFFICIENCY IS 0.40394, POWER FROM GEN -1.074E+09 J/S
 MODULE 7 IS B.C. NUMBER 2, MODID 412,NPATH= 0
 MODULE 8 IS VALV NUMBER 1, MODID 502,NPATH= 1
 RELATIVE VALVE POSITION IS 0.0000100, AND CHOKE FLOW IS 0.688E-04,AS DETERMINED USING OPTION 1
 MODULE 9 IS B.C. NUMBER 3, MODID 414,NPATH= 0
 MODULE 10 IS VALV NUMBER 2, MODID 501,NPATH= 1
 RELATIVE VALVE POSITION IS 0.0000100, AND CHOKE FLOW IS 0.727E-04,AS DETERMINED USING OPTION 1
 MODULE 11 IS B.C. NUMBER 4, MODID 416,NPATH= 0
 MODULE 12 IS B.C. NUMBER 5, MODID 411,NPATH= 0
 MODULE 13 IS PIPE NUMBER 3, MODID 21,NPATH= 1
 MODULE 14 IS B.C. NUMBER 6, MODID 403,NPATH= 0
 MODULE 15 IS H.X. NUMBER 1, MODID 301,NPATH= 1

THE HEAT FLUX AREA CORRECTION FACTOR IS 0.782411

T	NOD	I	NOD	O	NOD	QINR(KJ/S/M)	TINR(K)	T TUBE(K)	TOUTR(K)	QOUTR(KJ/S/M)	MODE,I	MODE,O	T,CORE	T,STRC
1	13	9	9.97823	481.14126	493.28569	526.27011	-9.97920	1	6	481.1	526.3			

MODULE 16 IS B.C. NUMBER 7, MODID 406,NPATH= 0
 MODULE 17 IS B.C. NUMBER 8, MODID 401,NPATH= 0
 MODULE 18 IS PIPE NUMBER 4, MODID 1,NPATH= 1
 MODULE 19 IS PUMP NUMBER 1, MODID 201,NPATH= 2
 PUMP SPEED= 3570.000 PUMP FLOW= 636.305 KG/S PUMP HEAD= 532.746 METERS
 MODULE 20 IS PIPE NUMBER 5, MODID 2,NPATH= 1
 MODULE 21 IS PIPE NUMBER 6, MODID 3,NPATH= 1
 MODULE 22 IS VOL. NUMBER 3, MODID 101,NPATH= 1
 MODULE 23 IS PIPE NUMBER 7, MODID 5,NPATH= 1
 MODULE 24 IS B.C. NUMBER 9, MODID 402,NPATH= 0
 MODULE 25 IS PIPE NUMBER 8, MODID 4,NPATH= 2
 MODULE 26 IS B.C. NUMBER 10, MODID 404,NPATH= 0

STANDARD TIME STEP NUMBER = 2 ACTUAL TIME STEP NUMBER = 30 TIME = 2.000000E+00 SECONDS

NORMALIZED CORE POWER	CORE POWER (MW)	THERMAL POWER (BTU/HR)	HEAT REMOV. RATE (BTU/HR)	ENERGY BALANCE (BTU)	WATER MASS BALANCE (LBM)	AIR MASS BALANCE (LBM)	VOLUME NUMBER	AVG. PRES. (PSIA)	TOT. MASS (LB)	AVG. ENTH. (BTU/LB)	AVG. DEN. (LB/FT3)	AVG. TEMP. (DEG. F)	AVG. QUAL.	BUBB. MASS (LB)	MIX. LEV. (FT)	LIQ. MASS (LB)	
1.000000E+00	2.300000E+03	7.891144E+09	0.000000E+00	4.117820E+08	8.921846E+05	3.306896E+03	1	2.28152E+03	4.02949E+04	6.20386E+02	4.26853E+01	6.04463E+02	0.00000E+00	0.00000E+00	1.16700E+01	4.02949E+04	
							2	2.25704E+03	8.14903E+03	6.20342E+02	4.26651E+01	6.04365E+02	0.00000E+00	0.00000E+00	3.59000E+00	8.14903E+03	
							3	2.25801E+03	1.14636E+04	6.20383E+02	4.26632E+01	6.04396E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.14636E+04	
							4	2.25129E+03	9.88034E+03	6.00274E+02	4.39517E+01	5.90268E+02	0.00000E+00	0.00000E+00	1.05400E+01	9.88034E+03	
							5	2.24446E+03	1.01369E+04	5.81395E+02	4.50929E+01	5.76438E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.01369E+04	
							7	2.23596E+03	2.08778E+04	5.57706E+02	4.64364E+01	5.58356E+02	0.00000E+00	0.00000E+00	9.40500E+00	2.08778E+04	
							8	2.23388E+03	1.05497E+04	5.48586E+02	4.69294E+01	5.51193E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.05497E+04	
							9	2.23386E+03	1.06217E+04	5.42543E+02	4.72496E+01	5.46389E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.06217E+04	
							10	2.23561E+03	1.26960E+04	5.42561E+02	4.72497E+01	5.46406E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.26960E+04	
							11	2.22702E+03	1.23405E+04	5.42543E+02	4.72455E+01	5.46376E+02	0.00000E+00	0.00000E+00	1.20500E+01	1.23405E+04	
							12	2.27446E+03	1.81445E+04	5.42967E+02	4.72514E+01	5.46800E+02	0.00000E+00	0.00000E+00	5.19000E+00	1.81445E+04	
							13	2.30897E+03	7.63947E+03	5.42927E+02	4.72739E+01	5.46831E+02	0.00000E+00	0.00000E+00	2.29000E+00	7.63947E+03	
							14	2.30095E+03	8.69723E+03	5.42958E+02	4.72676E+01	5.46841E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69723E+03	
							15	2.30080E+03	8.69711E+03	5.42969E+02	4.72669E+01	5.46850E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69711E+03	
							16	2.30331E+03	8.69727E+03	5.42980E+02	4.72678E+01	5.46863E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69727E+03	
							17	2.30191E+03	3.44096E+04	5.43000E+02	4.72659E+01	5.46876E+02	0.00000E+00	0.00000E+00	9.79000E+00	3.44096E+04	
							18	2.29632E+03	7.58852E+03	5.69876E+02	4.57967E+01	5.67866E+02	0.00000E+00	0.00000E+00	4.02000E+00	7.58852E+03	
							19	2.29204E+03	7.30604E+03	5.98560E+02	4.40920E+01	5.89140E+02	0.00000E+00	0.00000E+00	4.00000E+00	7.30604E+03	
							20	2.28770E+03	7.04130E+03	6.23350E+02	4.24943E+01	6.06505E+02	0.00000E+00	0.00000E+00	4.10000E+00	7.04130E+03	
							21	2.29762E+03	2.00872E+03	5.42987E+02	4.72641E+01	5.46858E+02	0.00000E+00	0.00000E+00	1.21000E+01	2.00872E+03	
							22	2.27944E+03	2.42700E+04	5.42961E+02	4.72547E+01	5.46804E+02	0.00000E+00	0.00000E+00	7.67000E+00	2.42700E+04	
							23	2.25713E+03	4.07452E+03	6.20342E+02	4.26651E+01	6.04365E+02	0.00000E+00	0.00000E+00	3.59000E+00	4.07452E+03	
							24	2.25811E+03	5.73395E+03	6.20383E+02	4.26633E+01	6.04396E+02	0.00000E+00	0.00000E+00	5.91000E+00	5.73395E+03	
							25	2.25138E+03	4.94019E+03	6.00272E+02	4.39519E+01	5.90267E+02	0.00000E+00	0.00000E+00	1.05400E+01	4.94019E+03	
							26	2.24456E+03	5.06847E+03	5.81393E+02	4.50931E+01	5.76436E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.06847E+03	
							28	2.23606E+03	1.04389E+04	5.57705E+02	4.64365E+01	5.58355E+02	0.00000E+00	0.00000E+00	9.40500E+00	1.04389E+04	
							29	2.23397E+03	5.27488E+03	5.48586E+02	4.69295E+01	5.51192E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.27488E+03	
							30	2.23396E+03	5.31086E+03	5.42544E+02	4.72496E+01	5.46389E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.31086E+03	
							31	2.23570E+03	6.35036E+03	5.42561E+02	4.72497E+01	5.46406E+02	0.00000E+00	0.00000E+00	5.91000E+00	6.35036E+03	
							32	2.22711E+03	6.17028E+03	5.42543E+02	4.72456E+01	5.46376E+02	0.00000E+00	0.00000E+00	1.20500E+01	6.17028E+03	
							33	2.27456E+03	9.07228E+03	5.42967E+02	4.72515E+01	5.46800E+02	0.00000E+00	0.00000E+00	5.19000E+00	9.07228E+03	
							34	2.30907E+03	3.81974E+03	5.42927E+02	4.72740E+01	5.46831E+02	0.00000E+00	0.00000E+00	2.29000E+00	3.81974E+03	
							35	2.30105E+03	4.34389E+03	5.42958E+02	4.72676E+01	5.46841E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.34389E+03	
							36	2.30089E+03	4.34383E+03	5.42969E+02	4.72669E+01	5.46850E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.34383E+03	
							37	2.30341E+03	4.34392E+03	5.42980E+02	4.72679E+01	5.46863E+02	0.00000E+00	0.00000E+00	8.62000E+00	4.34392E+03	
							39	LIQ REG VAP REG	2.25000E+03	2.85794E+04	7.01237E+02	3.66404E+01	6.54077E+02	6.30334E-07	1.80146E-02	2.85794E+04	
							40		3.25490E+03	1.11784E+03	6.25940E+00	6.54077E+02	9.99999E-01	3.25489E+03	2.18400E+01	2.82669E-03	
							101		2.25594E+03	1.50177E+03	6.20342E+02	4.26640E+01	6.04361E+02	0.00000E+00	0.00000E+00	9.23000E+00	1.50177E+03
							131		8.30133E+02	1.03232E+05	5.47268E+02	2.18296E+01	5.22043E+02	4.71507E-02	2.41106E+03	3.82517E+01	9.83646E+04
							132		8.21211E+02	2.44844E+02	1.19831E+03	1.80032E+00	5.20791E+02	9.99268E-01	2.44665E+02	3.24200E+01	1.79304E-01
							201		8.03979E+02	8.04045E+02	1.19831E+03	1.76132E+00	5.18345E+02	9.98574E-01	8.02898E+02	1.36300E+01	1.14643E+00
							231		8.30078E+02	2.06430E+05	5.47267E+02	2.18260E+01	5.22035E+02	4.71620E-02	4.82315E+03	3.82516E+01	1.96694E+05
							232		8.21156E+02	4.89653E+02	1.19831E+03	1.80020E+01	5.20783E+02	9.99268E-01	4.89295E+02	3.24200E+01	3.58579E-01
							500		8.03978E+02	1.53235E+03	1.19831E+03	1.76132E+00	5.18345E+02	9.98576E-01	1.53017E+03	1.36300E+01	2.18139E+00
							501		6.14689E+02	1.11384E+05	4.80058E+01	4.51859E+01	8.00000E+01	1.01517E-05	0.00000E+00	1.23900E+01	1.11383E+05
									6.14689E+02	5.56918E+04	4.80058E+01	4.51859E+01	8.00000E+01	1.01517E-05	0.00000E+00	1.23900E+01	5.56913E+04

701	8.36740E+02	6.08123E+03	4.17501E+02	5.22442E+01	4.38377E+02	0.00000E+00	0.00000E+00	2.00000E+00	6.08123E+03
801	8.36686E+02	1.21624E+04	4.17503E+02	5.22442E+01	4.38378E+02	0.00000E+00	0.00000E+00	2.00000E+00	1.21624E+04
900	1.47000E+01	6.44163E+04	1.18996E+03	3.30340E-02	3.00000E+02	1.00000E+00	6.44163E+04	0.00000E+00	0.00000E+00
901	7.90039E+02	1.75412E+00	1.19829E+03	1.72990E+00	5.16337E+02	9.97997E-01	1.75060E+00	1.36300E+01	3.51373E-03
902	7.90039E+02	3.50823E+00	1.19829E+03	1.72989E+00	5.16337E+02	9.97999E-01	3.50121E+00	1.36300E+01	7.01904E-03

JUNCTION NUMBER	CONNECTS VOLUMES	CHOKE MODE	JUN. FLOW (LB/SEC)	JUN. ENTH. (BTU/LB)	JUN. SPVL. (FT3/LB)	P R E S S U R E				D I F F E R E N T ACCL. PSI	I A L S PUMP PSI
						STAG. PSI	ELEV. PSI	FRIC. PSI	ACCL. PSI		
1	1 TO 2		1.87778E+04	6.20343E+02	2.34256E-02	1.43599E+01	1.33474E-01	-1.44934E+01	-1.51340E-06	0.00000E+00	
2	2 TO 3		1.87778E+04	6.20341E+02	2.34387E-02	9.45081E+00	-9.36234E-01	-8.51458E+00	-6.82400E-07	0.00000E+00	
3	3 TO 4		1.87778E+04	6.20372E+02	2.34394E-02	5.04208E+00	-2.48399E+00	-2.55809E+00	3.92452E-08	0.00000E+00	
4	4 TO 5		1.87778E+04	6.00267E+02	2.27535E-02	6.92139E+00	-3.25878E+00	-3.66261E+00	2.06712E-07	0.00000E+00	
5	5 TO 7		1.87778E+04	5.81388E+02	2.21775E-02	8.60427E+00	-3.14618E+00	-5.45809E+00	5.78961E-07	0.00000E+00	
7	7 TO 8		1.87778E+04	5.57712E+02	2.15356E-02	2.12468E+00	3.21298E+00	-5.33766E+00	1.29238E-06	0.00000E+00	
8	8 TO 9		1.87778E+04	5.48593E+02	2.13088E-02	3.83771E-02	3.44669E+00	-3.48506E+00	1.02433E-06	0.00000E+00	
9	9 TO 10		1.87778E+04	5.42550E+02	2.11644E-02	-1.17314E-01	2.69881E+00	-2.58149E+00	5.76891E-07	0.00000E+00	
10	10 TO 11		1.87778E+04	5.42535E+02	2.11634E-02	1.39927E+00	2.47717E+00	-3.87644E+00	1.84810E-06	0.00000E+00	
11	11 TO 12		1.87778E+04	5.42543E+02	2.11661E-02	-4.22964E+01	-7.74408E-01	-2.01965E+00	1.56945E-06	4.50905E+01	
12	12 TO 13		1.87778E+04	5.42927E+02	2.11626E-02	-4.41793E+01	-4.72513E-01	-4.38712E-01	7.50829E-07	4.50905E+01	
13	13 TO 14		1.87778E+04	5.42927E+02	2.11534E-02	1.65012E+01	-5.41608E-01	-1.59596E+01	3.33266E-08	0.00000E+00	
14	14 TO 15		1.87440E+04	5.42964E+02	2.11560E-02	1.75920E-01	2.83275E+00	-3.00867E+00	-1.05457E-08	0.00000E+00	
15	15 TO 16		1.87440E+04	5.42975E+02	2.11563E-02	-2.51267E+00	2.82948E+00	-3.16803E-01	5.78785E-08	0.00000E+00	
16	16 TO 17		1.87440E+04	5.42986E+02	2.11558E-02	4.26113E+00	1.97275E+00	-6.23388E+00	1.19293E-07	0.00000E+00	
17	17 TO 18		2.71302E+04	5.42991E+02	2.11571E-02	4.89172E+00	-2.24596E+00	-2.64576E+00	2.73444E-07	0.00000E+00	
18	18 TO 19		2.71302E+04	5.69874E+02	2.18360E-02	4.20036E+00	-1.25164E+00	-2.94872E+00	1.76659E-07	0.00000E+00	
19	19 TO 20		2.71302E+04	5.98557E+02	2.26803E-02	4.26737E+00	-1.21734E+00	-3.05039E+00	2.05534E-07	0.00000E+00	
20	20 TO 1		2.71302E+04	6.23348E+02	2.35332E-02	6.94530E+00	-2.27544E+00	-4.66985E+00	2.43747E-07	0.00000E+00	
21	21 TO 1		9.85800E+02	5.42975E+02	2.11581E-02	1.56611E+01	-3.65949E+00	-1.20016E+01	1.78256E-07	0.00000E+00	
22	22 TO 1		5.07016E+01	5.42965E+02	2.11618E-02	-2.68598E+00	2.69268E+00	-6.70041E-03	2.47775E-07	0.00000E+00	
23	23 TO 24		9.38892E+03	6.20341E+02	2.34386E-02	9.45079E+00	-9.36236E-01	-8.51456E+00	-8.33591E-07	0.00000E+00	
24	24 TO 25		9.38892E+03	6.20372E+02	2.34394E-02	5.04209E+00	-2.48400E+00	-2.55808E+00	-1.39583E-08	0.00000E+00	
25	25 TO 26		9.38892E+03	6.00266E+02	2.27534E-02	6.92139E+00	-3.25880E+00	-3.66259E+00	1.32267E-07	0.00000E+00	
26	26 TO 28		9.38891E+03	5.81386E+02	2.21774E-02	8.60426E+00	-3.14619E+00	-5.45807E+00	4.63630E-07	0.00000E+00	
28	28 TO 29		9.38891E+03	5.57711E+02	2.15355E-02	2.12466E+00	3.21299E+00	-5.33765E+00	1.16843E-06	0.00000E+00	
29	29 TO 30		9.38891E+03	5.48593E+02	2.13087E-02	3.83669E-02	3.44669E+00	-3.48506E+00	9.59262E-07	0.00000E+00	
30	30 TO 31		9.38890E+03	5.42550E+02	2.11644E-02	-1.17319E-01	2.69881E+00	-2.58149E+00	5.69999E-07	0.00000E+00	
31	31 TO 32		9.38890E+03	5.42535E+02	2.11634E-02	1.39927E+00	2.47717E+00	-3.87644E+00	2.10095E-06	0.00000E+00	
32	32 TO 33		9.38890E+03	5.42543E+02	2.11661E-02	-4.22965E+01	-7.74409E-01	-2.01965E+00	1.72820E-06	4.50906E+01	
33	33 TO 34		9.38890E+03	5.42927E+02	2.11626E-02	-4.41794E+01	-4.72514E-01	-4.38711E-01	1.06899E-06	4.50906E+01	
34	34 TO 35		9.38890E+03	5.42927E+02	2.11534E-02	1.65012E+01	-5.41608E-01	-1.59596E+01	8.14538E-07	0.00000E+00	
35	35 TO 36		9.37200E+03	5.42964E+02	2.11559E-02	1.75915E-01	2.83275E+00	-3.00867E+00	3.05050E-07	0.00000E+00	
36	36 TO 37		9.37200E+03	5.42975E+02	2.11562E-02	-2.51432E+00	2.83112E+00	-3.16803E-01	3.78565E-07	0.00000E+00	
37	37 TO 17		9.37200E+03	5.42986E+02	2.11558E-02	4.24917E+00	1.97111E+00	-6.22028E+00	3.82808E-07	0.00000E+00	
39	39 TO 40		4.71069E-02	7.01237E+02	2.72868E-02	-5.94345E+00	5.94319E+00	-6.32894E-08	-2.63377E-04	0.00000E+00	
40	40 TO 23		5.31302E-02	6.20348E+02	2.34384E-02	-1.19430E+00	1.19400E+00	-3.75492E-08	-3.03594E-04	0.00000E+00	
42	17 TO 21		9.85800E+02	5.42994E+02	2.11572E-02	4.77714E+00	-3.59246E+00	-1.18468E+00	5.33745E-08	0.00000E+00	
43	1 TO 23		9.38886E+03	6.20343E+02	2.34256E-02	1.43653E+01	1.33473E-01	-1.44934E+01	1.35471E-05	0.00000E+00	
44	35 TO 22		1.69000E+01	5.42900E+02	2.11552E-02	2.83636E+01	-2.67487E+00	-2.56887E+01	1.70454E-07	0.00000E+00	
45	14 TO 22		3.38000E+01	5.42900E+02	2.11552E-02	2.82684E+01	-2.67487E+00	-2.55935E+01	-1.87989E-07	0.00000E+00	
75	23 TO 900		0.00000E+00	6.20389E+02	2.34399E-02	0.00000E+00	1.54677E-01	0.00000E+00	0.00000E+00	0.00000E+00	
100	701 TO 101		9.34683E+02	4.17505E+02	1.91410E-02	8.23332E+00	-5.98639E+00	-2.24703E+00	-1.00466E-04	0.00000E+00	
101	101 TO 131		9.35307E+02	1.19855E+03	5.50686E-01	3.65370E+00	-1.64750E+00	-2.00623E+00	-3.11400E-05	0.00000E+00	
131	131 TO 132		9.35309E+02	1.19611E+03	5.53836E-01	1.70001E+01	2.86019E-01	-1.72863E+01	-1.14433E-04	0.00000E+00	
200	801 TO 201		1.87074E+03	4.17507E+02	1.91410E-02	8.23658E+00	-5.98570E+00	-2.25038E+00	4.90585E-04	0.00000E+00	
201	201 TO 231		1.87055E+03	1.19855E+03	5.50725E-01	3.65304E+00	-1.64685E+00	-2.00625E+00	-5.84541E-05	0.00000E+00	
231	231 TO 232		1.87056E+03	1.19612E+03	5.53875E-01	1.69473E+01	2.86004E-01	-1.72336E+01	-2.47719E-04	0.00000E+00	
500	500 TO 13		0.00000E+00	5.42974E+02	2.11544E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00	
501	501 TO 34		0.00000E+00	5.42974E+02	2.11544E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00	
901	132 TO 901		9.35314E+02	1.19829E+03	5.68510E-01	1.34573E+01	1.48730E-03	-1.34585E+01	2.19465E-04	0.00000E+00	
902	232 TO 902		1.87057E+03	1.19829E+03	5.68473E-01	1.34564E+01	1.48721E-03	-1.34577E+01	1.66347E-04	0.00000E+00	

800	0 TO 801	1.87110E+03	4.17252E+02	1.91373E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
700	0 TO 701	9.34864E+02	4.17251E+02	1.91373E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
601	0 TO 36	0.00000E+00	5.42982E+02	2.11567E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
600	0 TO 15	0.00000E+00	5.42982E+02	2.11568E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
290	0 TO 201	0.00000E+00	5.17235E+02	2.17700E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
254	0 TO 232	0.00000E+00	1.19888E+03	5.68148E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
253	0 TO 232	0.00000E+00	1.19888E+03	5.68148E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
252	0 TO 232	0.00000E+00	1.19888E+03	5.68148E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
251	0 TO 232	0.00000E+00	1.19888E+03	5.68148E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
235	0 TO 232	0.00000E+00	1.19888E+03	5.68148E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
234	0 TO 232	0.00000E+00	1.19888E+03	5.68148E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
232	0 TO 232	0.00000E+00	1.19840E+03	5.90342E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
190	0 TO 101	0.00000E+00	5.17243E+02	2.17697E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
154	0 TO 132	0.00000E+00	1.19888E+03	5.68146E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
153	0 TO 132	0.00000E+00	1.19888E+03	5.68146E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
152	0 TO 132	0.00000E+00	1.19888E+03	5.68146E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
151	0 TO 132	0.00000E+00	1.19888E+03	5.68146E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
135	0 TO 132	0.00000E+00	1.19888E+03	5.68146E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
134	0 TO 132	0.00000E+00	1.19888E+03	5.68146E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
132	0 TO 132	0.00000E+00	1.19840E+03	5.90342E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
95	0 TO 34	0.00000E+00	5.42972E+02	2.11544E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
94	0 TO 13	0.00000E+00	5.42972E+02	2.11545E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
92	0 TO 13	0.00000E+00	5.42973E+02	2.11544E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

PUMP NUMBER	VOLUME NUMBER	PUMP SPEED (RPM)	NORM. PUMP TORQUE	NORM. FRIC. TORQUE	NORM. MOT. TORQUE	POWER TO H2O (BTU/HR)
1	33	1.19000E+03	9.97561E-01	1.00000E+00	0.00000E+00	1.37479E+07
2	12	1.19000E+03	9.97559E-01	1.00000E+00	0.00000E+00	2.74957E+07

HEAT COND. NUMBER	VOL. NUM.	H.T. MODE	SURF. FLUX (BTU/HR-FT2)	CRIT. FLUX (BTU/HR-FT2)	H.T. COEF. (BTU/H-F2-F)	SURF. TEMP. (DEG. F)	MASS FLUX (LBM/HR-FT2)	STORD ENRGY (BTU)	POWR TO H2O (BTU/HR)
1	RIGHT	18	1.84648E+05	1.19235E+06	5.72837E+03	6.00100E+02	2.35801E+06	7.23050E+06	2.62611E+09
2	RIGHT	19	1.97017E+05	1.15766E+06	5.83990E+03	6.22876E+02	2.35801E+06	7.68589E+06	2.80202E+09
3	RIGHT	20	1.70281E+05	1.12975E+06	5.94333E+03	6.35156E+02	2.35801E+06	7.05712E+06	2.42177E+09
16	RIGHT	2	-3.85369E-03	1.15168E+06	6.52950E+03	6.04365E+02	7.36386E+06	2.59328E+06	-1.14069E+00
17	RIGHT	3	5.97436E-03	1.15106E+06	1.01191E+03	6.04396E+02	8.98461E+05	8.22283E+06	1.63494E+01
18	RIGHT	10	3.76348E-01	1.26819E+06	9.60271E+02	5.46406E+02	8.98459E+05	7.36861E+06	1.02991E+03
19	RIGHT	11	1.15812E+00	1.27345E+06	5.50280E+03	5.46376E+02	6.45039E+06	3.60621E+06	5.07258E+02
20	RIGHT	12	2.38496E-01	1.24334E+06	3.18977E+03	5.46800E+02	3.52084E+06	1.75118E+07	8.42846E+01
21	RIGHT	13	2.03466E-01	1.22100E+06	6.82997E+03	5.46831E+02	8.20389E+06	1.91579E+06	5.20872E+01
22	RIGHT	14	9.91249E-02	1.22624E+06	5.19015E+03	5.46841E+02	4.37824E+06	7.16016E+06	2.40279E+01
23	RIGHT	15	5.89348E-02	1.22632E+06	5.18272E+03	5.46850E+02	4.37036E+06	7.16029E+06	1.42858E+01
24	RIGHT	16	4.49453E-02	1.22466E+06	5.18269E+03	5.46863E+02	4.37036E+06	7.16048E+06	1.08947E+01
25	RIGHT	17	1.70159E-02	1.22555E+06	2.06937E+03	5.46876E+02	1.36118E+06	4.36586E+06	4.72531E+00
26	RIGHT	23	-3.65854E-03	1.15162E+06	6.52950E+03	6.04365E+02	7.36386E+06	1.29664E+06	-5.41465E-01
27	RIGHT	24	6.16065E-03	1.15100E+06	1.01191E+03	6.04396E+02	8.98461E+05	4.11142E+06	8.42961E+00
28	RIGHT	31	3.34612E-01	1.26813E+06	9.60271E+02	5.46406E+02	8.98459E+05	3.68431E+06	4.57850E+02
29	RIGHT	32	1.04953E+00	1.27339E+06	5.50280E+03	5.46376E+02	6.45039E+06	1.80310E+06	2.29848E+02
30	RIGHT	33	2.20697E-01	1.24328E+06	3.18977E+03	5.46800E+02	3.52084E+06	8.75590E+06	3.89972E+01
31	RIGHT	34	1.90051E-01	1.22094E+06	6.82997E+03	5.46831E+02	8.20389E+06	9.57898E+05	2.43265E+01
32	RIGHT	35	9.48367E-02	1.22618E+06	5.19015E+03	5.46841E+02	4.37824E+06	3.58008E+06	1.14942E+01
33	RIGHT	36	5.74546E-02	1.22626E+06	5.18272E+03	5.46850E+02	4.37036E+06	3.58014E+06	6.96350E+00
34	RIGHT	37	4.44008E-02	1.22459E+06	5.18269E+03	5.46863E+02	4.37036E+06	3.58024E+06	5.38137E+00
35	RIGHT	22	1.13977E-04	1.24017E+06	1.16856E+01	5.46804E+02	3.03547E+03	9.74428E+06	2.77192E-02
4	LEFT	4	-1.14880E+05	1.18020E+06	6.76683E+03	5.73291E+02	3.16777E+06	1.73758E+06	-1.35816E+09
	RIGHT	201	1.01754E+05	1.52746E+06	1.07931E+04	5.31463E+02	3.81160E+04	1.73758E+06	1.35817E+09
5	LEFT	5	-8.88815E+04	1.20898E+06	6.68131E+03	5.63135E+02	3.16777E+06	2.08798E+06	-1.27535E+09
	RIGHT	201	7.87265E+04	1.52746E+06	9.09617E+03	5.30690E+02	3.81160E+04	2.08798E+06	1.27536E+09
6	LEFT	7	-5.57811E+04	1.24649E+06	6.57800E+03	5.49876E+02	3.16777E+06	2.04277E+06	-8.00295E+08
	RIGHT	201	4.94083E+04	1.52746E+06	6.66773E+03	5.29445E+02	3.81160E+04	2.04277E+06	8.00307E+08

9	LEFT	9	1	-3.46332E+04	1.26928E+06	6.51298E+03	5.41071E+02	3.16776E+06		-4.09450E+08
	RIGHT	201	11	3.06767E+04	1.52746E+06	4.85270E+03	5.28356E+02	3.81160E+04	1.67881E+06	4.09461E+08
8	LEFT	8	1	-4.30279E+04	1.26063E+06	6.53886E+03	5.44612E+02	3.16777E+06		-6.17403E+08
	RIGHT	201	11	3.81123E+04	1.52746E+06	5.60817E+03	5.28831E+02	3.81160E+04	2.04683E+06	6.17415E+08
7	LEFT	7	1	-5.57811E+04	1.24649E+06	6.57800E+03	5.49876E+02	3.16777E+06		-8.00295E+08
	RIGHT	201	11	4.94083E+04	1.52746E+06	6.66773E+03	5.29445E+02	3.81160E+04	2.04277E+06	8.00307E+08
10	LEFT	25	1	-1.14864E+05	1.18015E+06	6.76682E+03	5.73293E+02	3.16777E+06		-6.79139E+08
	RIGHT	101	11	1.01740E+05	1.52747E+06	1.07923E+04	5.31470E+02	3.81026E+04	8.68797E+05	6.79143E+08
11	LEFT	26	1	-8.88649E+04	1.20892E+06	6.68130E+03	5.63136E+02	3.16777E+06		-6.37698E+08
	RIGHT	101	11	7.87117E+04	1.52747E+06	9.09519E+03	5.30697E+02	3.81026E+04	1.04400E+06	6.37702E+08
12	LEFT	28	1	-5.57662E+04	1.24644E+06	6.57799E+03	5.49878E+02	3.16777E+06		-4.00128E+08
	RIGHT	101	11	4.93949E+04	1.52747E+06	6.66664E+03	5.29452E+02	3.81026E+04	1.02139E+06	4.00133E+08
15	LEFT	30	1	-3.46207E+04	1.26922E+06	6.51298E+03	5.41073E+02	3.16777E+06		-2.04697E+08
	RIGHT	101	11	3.06656E+04	1.52747E+06	4.85161E+03	5.28363E+02	3.81026E+04	8.39411E+05	2.04701E+08
14	LEFT	29	1	-4.30142E+04	1.26057E+06	6.53885E+03	5.44614E+02	3.16777E+06		-3.08672E+08
	RIGHT	101	11	3.81000E+04	1.52747E+06	5.60707E+03	5.28838E+02	3.81026E+04	1.02343E+06	3.08677E+08
13	LEFT	28	1	-5.57662E+04	1.24644E+06	6.57799E+03	5.49878E+02	3.16777E+06		-4.00128E+08
	RIGHT	101	11	4.93949E+04	1.52747E+06	6.66664E+03	5.29452E+02	3.81026E+04	1.02139E+06	4.00133E+08

CORE SECT. NUMBER	HEAT COND. NUMBER	DEPTH REAC. EXT. ZR-H2O (FT)	DEPTH REAC. INT. ZR-H2O (FT)	HEAT GEN. ZR-H2O (BTU/HR)	COND. HEAT- ING RATE (BTU/HR)	DIR. MODER- ATOR HT RT (BTU/HR)	AVG. METAL TEMPERATURE (DEG. F)	CENTERLINE TEMPERATURE (DEG. F)
1	1	0.00000E+00	0.00000E+00	0.00000E+00	2.62611E+09	0.00000E+00	1.52207E+03	1.99764E+03
2	2	0.00000E+00	0.00000E+00	0.00000E+00	2.80202E+09	0.00000E+00	1.61303E+03	2.14152E+03
3	3	0.00000E+00	0.00000E+00	0.00000E+00	2.42177E+09	0.00000E+00	1.47730E+03	1.90598E+03

CONTEXT SAVE AT 2.00000 SECONDS STEP NO. 30
WRITTEN TO UNIT NUMBER 34

DATA RECORD NUMBER 3 WAS WRITTEN ON TAPE VSN = , DENSITY = PE, CREATED ON 90159
AND WAS LABELED RETRAN1

TIMING EDIT ACCUMULATED TIME = 5.208 SECONDS

SUBROUTINE	CPU TIME (SEC)	PERCENT	NUMBER OF CALLS
*****	*****	*****	*****
* STSTAT	2.604	50.00	1
* TRAN	2.604	50.00	1
* CONTRL	2.604	50.00	1758
* ENERGY	2.604	50.00	138

* INDICATES OUTER LOOP TIME

TIME STEP CONTROL SUMMARY FOR 13 ACTUAL TIME STEPS. THE AVERAGE TIME STEP SIZE FOR THE INTERVAL WAS 7.692308E-02 SECONDS.
 NUMBER OF TIMES EACH TEST CONTROLLED TIME STEP SIZE

UPPER LIMIT	LOWER LIMIT	PRESSURE CHANGE	MASS CHANGE	ENERGY CHANGE	COURANT LIMIT	SAT LINE CROSSING	AIR MASS CHANGE	ZERO FLOW CROSSING	TRIP ACTUATION
0	0	0	0	0	13	0	0	0	0

VOLUMES CONTROLLING COURANT LIMIT
 (VOLUME INDEX ; TIMES CONTROLLING)

20; 13

MINET, TIME= 3.00000 TIME STEP=0.06566 STEP NO. 43
 MINIMUM TIME CONSTANT= 5.238E-01 SEC, LIMIT KEY= 101

SYSTEM BOUNDARY CONDITIONS:

ID	NETWORK	FLOW(KG/S)	ENTHALPY(MJ/KG)	PRESSURE(MPA)	TEMP(K)	FLUID
413	1	848.456	2.787225	5.447091	542.089	H2O
412	1	1272.713	1.899158	3.892000	521.547	H2O
414	1	0.000	2.790899	4.892000	535.337	H2O
416	1	0.000	2.779055	5.000000	536.694	H2O
411	1	424.247	2.787221	5.447091	542.089	H2O
403	2	181.930	2.740000	4.230386	526.485	H2O
406	2	181.836	1.598576	4.200000	526.054	H2O
401	3	1272.610	0.808470	3.133950	463.120	H2O
402	3	424.038	0.971289	5.769097	498.800	H2O
404	3	848.724	0.971289	5.768716	498.800	H2O

SYSTEM VOLUMES

ID	PRESSURE(MPA)	ENTHALPY(MJ/KG)	TEMP(K)	LEVEL(RELATIVE)	HEAT INPUT(MJ/S)	NETWORK	REGIONS
111	5.444993	2.787223	542.065	0.000000	0.000000	1	1
112	5.167544	2.787230	538.757	0.000000	0.000000	1	1
101	5.989407	0.971293	498.794	0.000000	0.000000	3	1

SYSTEM SEGMENTS

SEG	NETWK	WIN(KG/S)	WOUT(KG/S)	WBAR(KG/S)	ALPHA IS IN MPA*SEC*SEC/KG/KG			POUT(MPA)	ALPHA, SEG	BETA(MPA)	CONNECTS TO:	
					EIN(MJ/KG)	EOUT(MJ/KG)	PIN(MPA)				IN	OUT
1	1	848.456	848.456	848.456	2.787225	2.787225	5.447091	5.445129	0.235E-08	-0.000272	413	111
2	1	1272.709	1272.713	1272.711	2.787223	2.787225	5.444993	5.167544	0.171E-06	0.000000	111	112
3	1	1272.713	1272.713	1272.713	2.787231	1.899158	5.167544	3.892000	0.787E-06	0.000000	112	412
4	1	0.000	0.000	0.000	2.787231	2.790899	5.167673	4.892000	0.238E+09	0.000000	112	414
5	1	0.000	0.000	0.000	2.787223	2.779055	5.444857	5.000000	0.228E+09	-0.000392	111	416
6	1	424.247	424.247	424.247	2.787221	2.787221	5.447091	5.445129	0.939E-08	-0.000272	411	111
7	2	181.930	181.836	181.883	2.740000	1.598576	4.230386	4.200000	0.943E-06	0.000817	403	406
8	3	1272.610	1272.717	1272.655	0.808470	0.971396	3.133950	5.989407	0.214E-05	6.317969	401	101
9	3	424.037	424.038	424.038	0.971293	0.971289	5.989407	5.769097	0.137E-05	0.026170	101	402
10	3	848.723	848.724	848.724	0.971293	0.971289	5.989407	5.768716	0.343E-06	0.026170	101	404

IN-SEGMENT DISTRIBUTIONS													JIN	JOUT
SEG	MODID	NODE	EIN(MJ/KG)	EBAR(MJ/KG)	EOUT(MJ/KG)	WIN(KG/S)	WOUT(KG/S)	TIN(K)	TBAR(K)	TOUT(K)	DENS(KG/M3)	QA(MJ/S)		
1	23	1	2.787225	2.787225	2.787225	848.456	848.456	542.078	542.078	542.078	27.715	0.000	1	2
2	22	2	2.787223	2.787223	2.787224	1272.709	1272.710	540.427	540.427	540.427	26.982	0.000	3	4
2	22	3	2.787224	2.787224	2.787224	1272.710	1272.711	540.427	540.427	540.427	26.982	0.000	4	5
2	22	4	2.787224	2.787224	2.787225	1272.711	1272.713	540.427	540.427	540.427	26.982	0.000	5	6
3	601	5	2.787231	2.343194	1.899158	1272.713	1272.713	530.612	530.612	530.612	30.978	-1130.261	7	8
4	502	6	2.787231	2.789065	2.790899	0.000	0.000	537.066	537.066	537.066	25.512	0.000	9	10
5	501	7	2.787223	2.783139	2.779055	0.000	0.000	539.422	539.422	539.422	26.609	0.000	11	12
6	21	8	2.787221	2.787221	2.787221	424.247	424.247	542.078	542.078	542.078	27.715	0.000	13	14
7	301	9	2.740000	2.169288	1.598576	181.930	181.836	526.270	526.270	526.270	33.169	-207.709	15	16
8	1	10	0.808470	0.808470	0.808470	1272.610	1272.610	462.949	462.949	462.949	876.723	0.000	17	18
8	201	11	0.808470	0.808470	0.808470	1272.610	1272.610	462.949	462.949	462.949	876.723	0.000	18	19
8	2	12	0.808470	0.808470	0.808470	1272.610	1272.610	462.949	462.949	462.949	876.723	0.000	19	20
8	301	13	0.808470	0.890003	0.971535	1272.610	1272.660	462.949	481.147	498.889	856.767	207.698	20	21
8	3	14	0.971535	0.971500	0.971465	1272.660	1272.689	498.889	498.882	498.874	835.597	0.000	21	22
8	3	15	0.971465	0.971430	0.971396	1272.689	1272.717	498.874	498.867	498.859	835.616	0.000	22	23
9	5	16	0.971293	0.971291	0.971290	424.037	424.038	498.798	498.797	498.797	836.931	0.000	24	25
9	5	17	0.971290	0.971289	0.971289	424.038	424.038	498.797	498.797	498.797	836.932	0.000	25	26
9	5	18	0.971289	0.971289	0.971289	424.038	424.038	498.797	498.797	498.797	836.932	0.000	26	27
10	4	19	0.971293	0.971291	0.971290	848.723	848.724	498.798	498.797	498.797	836.931	0.000	28	29
10	4	20	0.971290	0.971289	0.971289	848.724	848.724	498.797	498.797	498.797	836.932	0.000	29	30
10	4	21	0.971289	0.971289	0.971289	848.724	848.724	498.797	498.797	498.797	836.932	0.000	30	31

SYSTEM MODULES

MODULE 1 IS B.C. NUMBER 1, MODID 413,NPATH= 0
 MODULE 2 IS PIPE NUMBER 1, MODID 23,NPATH= 2
 MODULE 3 IS VOL. NUMBER 1, MODID 111,NPATH= 1
 MODULE 4 IS PIPE NUMBER. 2, MODID 22,NPATH= 3
 MODULE 5 IS VOL. NUMBER 2, MODID 112,NPATH= 1
 MODULE 6 IS TBSG NUMBER 1, MODID 601,NPATH= 1
 SPEED IN RPM IS 1800.00, EFFICIENCY IS 0.40395, POWER FROM GEN -1.074E+09 J/S
 MODULE 7 IS B.C. NUMBER 2, MODID 412,NPATH= 0
 MODULE 8 IS VALV NUMBER 1, MODID 502,NPATH= 1
 RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.688E-04,AS DETERMINED USING OPTION 1
 MODULE 9 IS B.C. NUMBER 3, MODID 414,NPATH= 0
 MODULE 10 IS VALV NUMBER 2, MODID 501,NPATH= 1
 RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.727E-04,AS DETERMINED USING OPTION 1
 MODULE 11 IS B.C. NUMBER 4, MODID 416,NPATH= 0
 MODULE 12 IS B.C. NUMBER 5, MODID 411,NPATH= 0
 MODULE 13 IS PIPE NUMBER 3, MODID 21,NPATH= 1
 MODULE 14 IS B.C. NUMBER 6, MODID 403,NPATH= 0
 MODULE 15 IS H.X. NUMBER 1, MODID 301,NPATH= 1

THE HEAT FLUX AREA CORRECTION FACTOR IS 0.782411

T NOD	I NOD	O NOD	QINR(KJ/S/M)	TINR(K)	T TUBE(K)	TOUTR(K)	QOUTR(KJ/S/M)	MODE,I	MODE,O	T,CORE	T,STRC
1	13	9	9.97703	481.14736	493.29019	526.27022	-9.97767	1	6	481.1	526.3
MODULE 16	IS B.C. NUMBER	7,	MODID 406,NPATH=	0							
MODULE 17	IS B.C. NUMBER	8,	MODID 401,NPATH=	0							
MODULE 18	IS PIPE NUMBER	4,	MODID 1,NPATH=	1							
MODULE 19	IS PUMP NUMBER	1,	MODID 201,NPATH=	2							
PUMP SPEED= 3570.000			PUMP FLOW=	636.305 KG/S	PUMP HEAD= 532.746 METERS						
MODULE 20	IS PIPE NUMBER	5,	MODID 2,NPATH=	1							
MODULE 21	IS PIPE NUMBER	6,	MODID 3,NPATH=	1							
MODULE 22	IS VOL. NUMBER	3,	MODID 101,NPATH=	1							
MODULE 23	IS PIPE NUMBER	7,	MODID 5,NPATH=	1							
MODULE 24	IS B.C. NUMBER	9,	MODID 402,NPATH=	0							
MODULE 25	IS PIPE NUMBER	8,	MODID 4,NPATH=	2							
MODULE 26	IS B.C. NUMBER	10,	MODID 404,NPATH=	0							

STANDARD TIME STEP NUMBER = 3 ACTUAL TIME STEP NUMBER = 43 TIME = 3.000000E+00 SECONDS

	NORMALIZED CORE POWER	CORE POWER (MW)	THERMAL POWER (BTU/HR)	HEAT REMOV. RATE (BTU/HR)	ENERGY BALANCE (BTU)	WATER MASS BALANCE (LBM)	AIR MASS BALANCE (LBM)			
	1.000000E+00	2.300000E+03	7.891144E+09	0.000000E+00	4.117809E+08	8.921847E+05	3.306896E+03			
VOLUME NUMBER	AVG. PRES. (PSIA)	TOT. MASS (LB)	AVG. ENTH. (BTU/LB)	AVG. DEN. (LB/FT3)	AVG. TEMP. (DEG. F)	AVG. QUAL.	BUBB. MASS (LB)	MIX. LEV. (FT)	LIQ. MASS (LB)	
1	2.28152E+03	4.02949E+04	6.20386E+02	4.26853E+01	6.04462E+02	0.00000E+00	0.00000E+00	1.16700E+01	4.02949E+04	
2	2.25704E+03	8.14902E+03	6.20342E+02	4.26651E+01	6.04365E+02	0.00000E+00	0.00000E+00	3.59000E+00	8.14902E+03	
3	2.25801E+03	1.14636E+04	6.20383E+02	4.26632E+01	6.04396E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.14636E+04	
4	2.25128E+03	9.88034E+03	6.00274E+02	4.39517E+01	5.90268E+02	0.00000E+00	0.00000E+00	1.05400E+01	9.88034E+03	
5	2.24446E+03	1.01369E+04	5.81395E+02	4.50929E+01	5.76437E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.01369E+04	
7	2.23596E+03	2.08778E+04	5.57706E+02	4.64364E+01	5.58356E+02	0.00000E+00	0.00000E+00	9.40500E+00	2.08778E+04	
8	2.23387E+03	1.05497E+04	5.48586E+02	4.69294E+01	5.51192E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.05497E+04	
9	2.23386E+03	1.06217E+04	5.42543E+02	4.72496E+01	5.46388E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.06217E+04	
10	2.23560E+03	1.26960E+04	5.42560E+02	4.72497E+01	5.46405E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.26960E+04	
11	2.22701E+03	1.23405E+04	5.42542E+02	4.72456E+01	5.46375E+02	0.00000E+00	0.00000E+00	1.20500E+01	1.23405E+04	
12	2.27446E+03	1.81446E+04	5.42966E+02	4.72514E+01	5.46800E+02	0.00000E+00	0.00000E+00	5.19000E+00	1.81446E+04	
13	2.30897E+03	7.63947E+03	5.42972E+02	4.72739E+01	5.46831E+02	0.00000E+00	0.00000E+00	2.29000E+00	7.63947E+03	
14	2.30095E+03	8.69723E+03	5.42958E+02	4.72676E+01	5.46841E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69723E+03	
15	2.30080E+03	8.69711E+03	5.42969E+02	4.72669E+01	5.46850E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69711E+03	
16	2.30331E+03	8.69728E+03	5.42980E+02	4.72678E+01	5.46863E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69728E+03	
17	2.30191E+03	3.44096E+04	5.43000E+02	4.72659E+01	5.46876E+02	0.00000E+00	0.00000E+00	9.79000E+00	3.44096E+04	
18	2.29632E+03	7.58852E+03	5.69876E+02	4.57967E+01	5.67866E+02	0.00000E+00	0.00000E+00	4.02000E+00	7.58852E+03	
19	2.29204E+03	7.30604E+03	5.98560E+02	4.40920E+01	5.89140E+02	0.00000E+00	0.00000E+00	0.00000E+00	7.30604E+03	
20	2.28770E+03	7.04130E+03	6.23350E+02	4.24943E+01	6.65050E+02	0.00000E+00	0.00000E+00	4.10000E+00	7.04130E+03	
21	2.29762E+03	2.00872E+03	5.42987E+02	4.72641E+01	5.46858E+02	0.00000E+00	0.00000E+00	1.21000E+01	2.00872E+03	
22	2.27943E+03	2.42700E+04	5.42961E+02	4.72547E+01	5.46804E+02	0.00000E+00	0.00000E+00	7.67000E+00	2.42700E+04	
23	2.25713E+03	4.07452E+03	6.20342E+02	4.26651E+01	6.04365E+02	0.00000E+00	0.00000E+00	3.59000E+00	4.07452E+03	
24	2.25811E+03	5.73395E+03	6.20383E+02	4.26633E+01	6.04396E+02	0.00000E+00	0.00000E+00	5.91000E+00	5.73395E+03	
25	2.25138E+03	4.94019E+03	6.00272E+02	4.39519E+01	5.90267E+02	0.00000E+00	0.00000E+00	1.05400E+01	4.94019E+03	
26	2.24455E+03	5.06847E+03	5.81392E+02	4.50931E+01	5.76436E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.06847E+03	
28	2.23606E+03	1.04389E+04	5.57704E+02	4.64365E+01	5.58355E+02	0.00000E+00	0.00000E+00	9.40500E+00	1.04389E+04	
29	2.23397E+03	5.27488E+03	5.48585E+02	4.69295E+01	5.51192E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.27488E+03	
30	2.23396E+03	5.31086E+03	5.42543E+02	4.72496E+01	5.46388E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.31086E+03	
31	2.23570E+03	6.35037E+03	5.42560E+02	4.72498E+01	5.46405E+02	0.00000E+00	0.00000E+00	5.91000E+00	6.35037E+03	
32	2.22711E+03	6.17028E+03	5.42542E+02	4.72456E+01	5.46376E+02	0.00000E+00	0.00000E+00	1.20500E+01	6.17028E+03	
33	2.27455E+03	9.07229E+03	5.42966E+02	4.72515E+01	5.46800E+02	0.00000E+00	0.00000E+00	5.19000E+00	9.07229E+03	
34	2.30907E+03	3.81974E+03	5.42927E+02	4.72740E+01	5.46831E+02	0.00000E+00	0.00000E+00	2.29000E+00	3.81974E+03	
35	2.30104E+03	4.34389E+03	5.42958E+02	4.72676E+01	5.46841E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.34389E+03	
36	2.30089E+03	4.34383E+03	5.42969E+02	4.72670E+01	5.46850E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.34383E+03	
37	2.30341E+03	4.34392E+03	5.42980E+02	4.72679E+01	5.46863E+02	0.00000E+00	0.00000E+00	8.62000E+00	4.34392E+03	
39	LIQ REG VAP REG	2.25000E+03	2.85794E+04	7.01237E+02	3.66403E+01	6.54077E+02	1.05023E-06	3.00149E-02	2.85793E+04	
			3.25490E+03	1.11784E+03	6.25940E+00	6.54077E+02	9.99998E-01	3.25490E+03	2.18399E+01	
40		2.25594E+03	1.50176E+03	6.20346E+02	4.26638E+01	6.04364E+02	0.00000E+00	0.00000E+00	9.23000E+00	
101		8.30127E+02	1.03231E+05	5.47267E+02	2.18295E+01	5.22042E+02	4.71508E-02	2.41109E+03	3.82518E+01	
131		8.21205E+02	2.44842E+02	1.19831E+03	1.80031E+00	5.20790E+02	9.99268E-01	2.44663E+02	3.24200E+01	
132		8.03974E+02	8.04039E+02	1.19831E+03	1.76131E+00	5.18344E+02	9.98574E-01	8.02893E+02	1.36300E+01	
201		8.30071E+02	2.06430E+05	5.47265E+02	2.18260E+01	5.22034E+02	4.71615E-02	4.82313E+03	3.82517E+01	
231		8.21150E+02	4.89649E+02	1.19831E+03	1.80018E+00	5.20783E+02	9.99268E-01	4.89291E+02	3.24200E+01	
232		8.03973E+02	1.53234E+03	1.19831E+03	1.76131E+00	5.18344E+02	9.98576E-01	1.53015E+03	1.36300E+01	
500		6.14684E+02	1.11384E+05	4.80058E+01	4.51859E+01	8.00000E+01	1.01517E-05	0.00000E+00	1.23900E+01	
501		6.14684E+02	5.56918E+04	4.80058E+01	4.51859E+01	8.00000E+01	1.01517E-05	0.00000E+00	1.23900E+01	

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701	8.36735E+02	6.08140E+03	4.17464E+02	5.22457E+01	4.38343E+02	0.00000E+00	0.00000E+00	2.00000E+00	6.08140E+03
801	8.36680E+02	1.21628E+04	4.17466E+02	5.22456E+01	4.38345E+02	0.00000E+00	0.00000E+00	2.00000E+00	1.21628E+04
900	1.47000E+01	6.44163E+04	1.18996E+03	3.30340E-02	3.00000E+02	1.00000E+00	6.44163E+04	0.00000E+00	0.00000E+00
901	7.90034E+01	1.75411E+00	1.19829E+03	1.72989E+02	5.16336E+02	9.97997E-01	1.75059E+00	1.36300E+01	3.51405E-03
902	7.90034E+02	3.50820E+00	1.19829E+03	1.72988E+00	5.16336E+02	9.97999E-01	3.50118E+00	1.36300E+01	7.01944E-03

JUNCTION NUMBER	CONNECTS VOLUMES	CHOKE MODE	JUN. FLOW (LB/SEC)	JUN. ENTH. (BTU/LB)	JUN. SPVL. (FT3/LB)	P R E S S U R E				D I F F E R E N T I A L S	
						STAG. PSI	ELEV. PSI	FRIC. PSI	ACCL. PSI	PUMP PSI	
1	1 TO 2		1.87779E+04	6.20343E+02	2.34256E-02	1.43599E+01	1.33474E-01	-1.44934E+01	4.02892E-06	0.00000E+00	
2	2 TO 3		1.87779E+04	6.20341E+02	2.34387E-02	9.45084E+00	-9.36234E-01	-8.51460E+00	3.85171E-06	0.00000E+00	
3	3 TO 4		1.87779E+04	6.20372E+02	2.34394E-02	5.04209E+00	-2.48400E+00	-2.55809E+00	1.03038E-06	0.00000E+00	
4	4 TO 5		1.87779E+04	6.00267E+02	2.27535E-02	6.92140E+00	-3.25879E+00	-3.66261E+00	1.68565E-06	0.00000E+00	
5	5 TO 7		1.87778E+04	5.81388E+02	2.21775E-02	8.60428E+00	-3.14618E+00	-5.45810E+00	2.45586E-06	0.00000E+00	
7	7 TO 8		1.87778E+04	5.57712E+02	2.15356E-02	2.12468E+00	3.21298E+00	-5.33766E+00	2.64812E-06	0.00000E+00	
8	8 TO 9		1.87778E+04	5.48592E+02	2.13088E-02	3.83772E-02	3.44669E+00	-3.48507E+00	1.79744E-06	0.00000E+00	
9	9 TO 10		1.87778E+04	5.42549E+02	2.11644E-02	-1.17315E-01	2.69881E+00	-2.58149E+00	9.58824E-07	0.00000E+00	
10	10 TO 11		1.87778E+04	5.42535E+02	2.11634E-02	1.39927E+00	2.47717E+00	-3.87644E+00	3.60602E-06	0.00000E+00	
11	11 TO 12		1.87778E+04	5.42542E+02	2.11661E-02	-4.22964E+01	-7.74408E-01	-2.01965E+00	4.97863E-06	4.50905E+01	
12	12 TO 13		1.87778E+04	5.42927E+02	2.11626E-02	-4.41793E+01	-4.72514E-01	-4.38711E-01	3.88877E-06	4.50905E+01	
13	13 TO 14		1.87778E+04	5.42927E+02	2.11534E-02	1.65012E+01	-5.41608E-01	-1.59596E+01	1.20595E-06	0.00000E+00	
14	14 TO 15		1.87440E+04	5.42964E+02	2.11560E-02	1.75917E-01	2.83275E+00	-3.00867E+00	2.49259E-07	0.00000E+00	
15	15 TO 16		1.87440E+04	5.42975E+02	2.11563E-02	-2.51267E+00	2.82948E+00	-3.16803E-01	1.45759E-08	0.00000E+00	
16	16 TO 17		1.87440E+04	5.42986E+02	2.11558E-02	4.26112E+00	1.97275E+00	-6.23387E+00	-5.37296E-08	0.00000E+00	
17	17 TO 18		2.71302E+04	5.42991E+02	2.11571E-02	4.89172E+00	-2.24596E+00	-2.64576E+00	-1.27520E-07	0.00000E+00	
18	18 TO 19		2.71302E+04	5.69874E+02	2.11836E-02	4.20035E+00	-1.25163E+00	-2.94872E+00	-8.08734E-08	0.00000E+00	
19	19 TO 20		2.71302E+04	5.98557E+02	2.26803E-02	4.26773E+00	-1.21734E+00	-3.05039E+00	-9.08631E-08	0.00000E+00	
20	20 TO 1		2.71302E+04	6.23348E+02	2.35332E-02	6.94529E+00	-2.27544E+00	-4.66985E+00	-9.72402E-08	0.00000E+00	
21	21 TO 1		9.85799E+02	5.42975E+02	2.11581E-02	1.56611E+01	-3.65949E+00	-1.20016E+01	-2.17268E-08	0.00000E+00	
22	22 TO 1		5.06998E+01	5.42965E+02	2.11618E-02	-2.68598E+00	6.69268E+00	-6.69995E-03	3.20587E-08	0.00000E+00	
23	23 TO 24		9.38893E+03	6.20341E+02	2.34386E-02	9.45082E+00	-9.36236E-01	-8.51458E+00	3.04162E-06	0.00000E+00	
24	24 TO 25		9.38893E+03	6.20372E+02	2.34394E-02	5.04209E+00	-2.48400E+00	-2.55809E+00	8.20815E-07	0.00000E+00	
25	25 TO 26		9.38893E+03	6.00266E+02	2.27534E-02	6.92140E+00	-3.25880E+00	-3.66260E+00	1.30207E-06	0.00000E+00	
26	26 TO 28		9.38892E+03	5.81386E+02	2.21774E-02	8.60427E+00	-3.14619E+00	-5.45808E+00	1.82325E-06	0.00000E+00	
28	28 TO 29		9.38892E+03	5.57710E+02	2.15355E-02	2.12466E+00	3.21299E+00	-5.33765E+00	1.85887E-06	0.00000E+00	
29	29 TO 30		9.38891E+03	5.48592E+02	2.13087E-02	3.83689E-02	3.44670E+00	-3.48506E+00	1.22917E-06	0.00000E+00	
30	30 TO 31		9.38891E+03	5.42550E+02	2.11643E-02	-1.17318E-01	2.69881E+00	-2.58149E+00	6.29776E-07	0.00000E+00	
31	31 TO 32		9.38891E+03	5.42535E+02	2.11633E-02	1.39927E+00	2.47718E+00	-3.87644E+00	2.30284E-06	0.00000E+00	
32	32 TO 33		9.38890E+03	5.42543E+02	2.11660E-02	-4.22965E+01	-7.74409E-01	-2.01965E+00	3.79852E-06	4.50906E+01	
33	33 TO 34		9.38890E+03	5.42927E+02	2.11626E-02	-4.41794E+01	-4.72514E-01	-4.38711E-01	2.99942E-06	4.50906E+01	
34	34 TO 35		9.38890E+03	5.42927E+02	2.11534E-02	1.65012E+01	-5.41608E-01	-1.59596E+01	3.31413E-07	0.00000E+00	
35	35 TO 36		9.37200E+03	5.42964E+02	2.11559E-02	1.75914E-01	2.83275E+00	-3.00867E+00	-5.57439E-08	0.00000E+00	
36	36 TO 37		9.37200E+03	5.42975E+02	2.11562E-02	-2.51432E+00	2.83112E+00	-3.16803E-01	-2.60653E-07	0.00000E+00	
37	37 TO 17		9.37200E+03	5.42986E+02	2.11558E-02	4.24916E+00	1.97111E+00	-6.22028E+00	-2.70034E-07	0.00000E+00	
39	39 TO 40		9.77644E-02	7.01237E+02	2.72868E-02	-5.94296E+00	5.94317E+00	-2.35819E-07	2.12500E-04	0.00000E+00	
40	40 TO 23		1.10081E-01	6.20351E+02	2.34386E-02	-1.19374E+00	1.19399E+00	-1.24020E-07	2.47588E-04	0.00000E+00	
42	17 TO 21		9.85799E+02	5.42994E+02	2.11572E-02	4.77714E+00	-3.59246E+00	-1.18467E+00	-6.16935E-08	0.00000E+00	
43	1 TO 23		9.38882E+03	6.20343E+02	2.34256E-02	1.43651E+01	1.33473E-01	-1.44986E+01	-9.29453E-06	0.00000E+00	
44	35 TO 22		1.69000E+01	5.42900E+02	2.11552E-02	2.83636E+01	-2.67487E+00	-2.56887E+01	3.26559E-07	0.00000E+00	
45	14 TO 22		3.38000E+01	5.42900E+02	2.11552E-02	2.82684E+01	-2.67487E+00	-2.55935E+01	5.68672E-07	0.00000E+00	
75	23 TO 900		0.00000E+00	6.20389E+02	2.34399E-02	0.00000E+00	1.54677E-01	0.00000E+00	0.00000E+00	0.00000E+00	
100	701 TO 101		9.34688E+02	4.17468E+02	1.91404E-02	8.23345E+00	-5.98635E+00	-2.24698E+00	1.19546E-04	0.00000E+00	
101	101 TO 131		9.35295E+02	1.19855E+03	5.50690E-01	3.65366E+00	-1.64749E+00	-2.00619E+00	-2.25480E-05	0.00000E+00	
131	131 TO 132		9.35297E+02	1.19611E+03	5.53840E-01	1.69998E+01	2.86017E-01	-1.72859E+01	-8.57101E-05	0.00000E+00	
200	801 TO 201		1.87081E+03	4.17469E+02	1.91405E-02	8.23650E+00	-5.98570E+00	-2.25048E+00	3.24543E-04	0.00000E+00	
201	201 TO 231		1.87051E+03	1.19855E+03	5.50730E-01	3.65297E+00	-1.64685E+00	-2.00616E+00	-4.27824E-05	0.00000E+00	
231	231 TO 232		1.87051E+03	1.19612E+03	5.53879E-01	1.69466E+01	2.86002E-01	-1.72328E+01	-1.84953E-04	0.00000E+00	
500	500 TO 13		0.00000E+00	5.42973E+02	2.11544E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00	
501	501 TO 34		0.00000E+00	5.42973E+02	2.11544E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00	
901	132 TO 901		9.35303E+02	1.19829E+03	5.68514E-01	1.34571E+01	1.48728E-03	-1.34583E+01	3.06464E-04	0.00000E+00	
902	232 TO 902		1.87052E+03	1.19829E+03	5.68477E-01	1.34560E+01	1.48715E-03	-1.34572E+01	2.71830E-04	0.00000E+00	

800	0 TO 801	1.87112E+03	4.17252E+02	1.91373E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
700	0 TO 701	9.34843E+02	4.17251E+02	1.91373E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
601	0 TO 36	0.00000E+00	5.42982E+02	2.11567E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
600	0 TO 15	0.00000E+00	5.42988E+02	2.11568E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
290	0 TO 201	0.00000E+00	5.17233E+02	2.17700E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
254	0 TO 232	0.00000E+00	1.19888E+03	5.68152E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
253	0 TO 232	0.00000E+00	1.19888E+03	5.68152E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
252	0 TO 232	0.00000E+00	1.19888E+03	5.68152E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
251	0 TO 232	0.00000E+00	1.19888E+03	5.68152E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
235	0 TO 232	0.00000E+00	1.19888E+03	5.68152E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
234	0 TO 232	0.00000E+00	1.19888E+03	5.68152E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
232	0 TO 232	0.00000E+00	1.19840E+03	5.90342E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
190	0 TO 101	0.00000E+00	5.17242E+02	2.17697E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
154	0 TO 132	0.00000E+00	1.19888E+03	5.68150E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
153	0 TO 132	0.00000E+00	1.19888E+03	5.68150E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
152	0 TO 132	0.00000E+00	1.19888E+03	5.68150E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
151	0 TO 132	0.00000E+00	1.19888E+03	5.68150E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
135	0 TO 132	0.00000E+00	1.19888E+03	5.68150E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
134	0 TO 132	0.00000E+00	1.19888E+03	5.68150E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
132	0 TO 132	0.00000E+00	1.19840E+03	5.90342E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
95	0 TO 34	0.00000E+00	5.42972E+02	2.11544E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
94	0 TO 13	0.00000E+00	5.42972E+02	2.11545E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
92	0 TO 13	0.00000E+00	5.42973E+02	2.11544E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

PUMP NUMBER	VOLUME NUMBER	PUMP SPEED (RPM)	NORM. PUMP TORQUE	NORM. FRIC. TORQUE	NORM. MOT. TORQUE	POWER TO H2O (BTU/HR)
1	33	1.19000E+03	9.97561E-01	1.00000E+00	0.00000E+00	1.37479E+07
2	12	1.19000E+03	9.97560E-01	1.00000E+00	0.00000E+00	2.74957E+07

HEAT COND. NUMBER	VOL. NUM.	H.T. MODE	SURF. FLUX (BTU/HR-FT ²)	CRIT. FLUX (BTU/HR-FT ²)	H.T. COEF. (BTU/H-F ² -F)	SURF. TEMP. (DEG. F)	MASS FLUX (LBM/HR-FT ²)	STORD ENRGY (BTU)	POWR TO H2O (BTU/HR)
1	RIGHT 18	1	1.84648E+05	1.19235E+06	5.72837E+03	6.00100E+02	2.35801E+06	7.23050E+06	2.62611E+09
2	RIGHT 19	1	1.97017E+05	1.15766E+06	5.83990E+03	6.22876E+02	2.35801E+06	7.68589E+06	2.80202E+09
3	RIGHT 20	1	1.70281E+05	1.12975E+06	5.94333E+03	6.35156E+02	2.35801E+06	7.05712E+06	2.42177E+09
16	RIGHT 2	1	1.72779E-02	1.15168E+06	6.52951E+03	6.04365E+02	7.36386E+06	2.59328E+06	5.11425E+00
17	RIGHT 3	1	1.16106E-02	1.15106E+06	1.01191E+03	6.04396E+02	8.98462E+05	8.22283E+06	3.17737E+01
18	RIGHT 10	1	7.54235E-01	1.26819E+06	9.60271E+02	5.46406E+02	8.98460E+05	7.36861E+06	2.06404E+03
19	RIGHT 11	1	3.14749E+00	1.27345E+06	5.50280E+03	5.46376E+02	6.45039E+06	3.60621E+06	1.37860E+03
20	RIGHT 12	1	9.91050E-01	1.24335E+06	3.18977E+03	5.46800E+02	3.52084E+06	1.75118E+07	3.50237E+02
21	RIGHT 13	1	9.83795E-01	1.22100E+06	6.82997E+03	5.46831E+02	8.20389E+06	1.91579E+06	2.51852E+02
22	RIGHT 14	1	6.49055E-01	1.22624E+06	5.19015E+03	5.46841E+02	4.37824E+06	7.16016E+06	1.57331E+02
23	RIGHT 15	1	3.88310E-01	1.22632E+06	5.18272E+03	5.46850E+02	4.37036E+06	7.16029E+06	9.41263E+01
24	RIGHT 16	1	2.38397E-01	1.22466E+06	5.18269E+03	5.46863E+02	4.37036E+06	7.16048E+06	5.77874E+01
25	RIGHT 17	1	5.51038E-02	1.22555E+06	2.06937E+03	5.46876E+02	1.36118E+06	4.36586E+06	1.53023E+01
26	RIGHT 23	1	1.76634E-02	1.15163E+06	6.52951E+03	6.04365E+02	7.36386E+06	1.29664E+06	2.61418E+00
27	RIGHT 24	1	1.15317E-02	1.15100E+06	1.01191E+03	6.04396E+02	8.98462E+05	4.11142E+06	1.57788E+01
28	RIGHT 31	1	6.47481E-01	1.26813E+06	9.60271E+02	5.46406E+02	8.98460E+05	3.68431E+06	8.85949E+02
29	RIGHT 32	1	2.74572E+00	1.27340E+06	5.50280E+03	5.46376E+02	6.45039E+06	1.80310E+06	6.01313E+02
30	RIGHT 33	1	8.83512E-01	1.24329E+06	3.18977E+03	5.46800E+02	3.52084E+06	8.75590E+06	1.56117E+02
31	RIGHT 34	1	8.80771E-01	1.22094E+06	6.82997E+03	5.46831E+02	8.20389E+06	9.57898E+05	1.12739E+02
32	RIGHT 35	1	5.94672E-01	1.22618E+06	5.19015E+03	5.46841E+02	4.37824E+06	3.58008E+06	7.20743E+01
33	RIGHT 36	1	3.62128E-01	1.22626E+06	5.18272E+03	5.46850E+02	4.37036E+06	3.58014E+06	4.38899E+01
34	RIGHT 37	1	2.26809E-01	1.22460E+06	5.18269E+03	5.46863E+02	4.37036E+06	3.58024E+06	2.74892E+01
35	RIGHT 22	1	2.95202E-04	1.24017E+06	1.16854E+01	5.46804E+02	3.03541E+03	9.74428E+06	7.17930E-02
4	LEFT 4	1	-1.14881E+05	1.18020E+06	6.76684E+03	5.73291E+02	3.16777E+06		-1.35818E+09
	RIGHT 201	11	1.01755E+05	1.52746E+06	1.07932E+04	5.31462E+02	3.81161E+04	1.73758E+06	1.35819E+09
5	LEFT 5	1	-8.88825E+04	1.20898E+06	6.68131E+03	5.63134E+02	3.16777E+06		-1.27537E+09
	RIGHT 201	11	7.87275E+04	1.52746E+06	9.09622E+03	5.30689E+02	3.81161E+04	2.08798E+06	1.27538E+09
6	LEFT 7	1	-5.57818E+04	1.24650E+06	6.57800E+03	5.49876E+02	3.16777E+06		-8.00305E+08
	RIGHT 201	11	4.94089E+04	1.52746E+06	6.66777E+03	5.29444E+02	3.81161E+04	2.04277E+06	8.00317E+08

CONTEXT SAVE AT 3.00000 SECONDS STEP NO. 43

WRITTEN TO UNIT NUMBER 34

DATA RECORD NUMBER 4 WAS WRITTEN ON TAPE VSN = , DENSITY = PE, CREATED ON 90159
AND WAS LABELED RETRAN1

TIMING EDIT ACCUMULATED TIME = 5.208 SECONDS

SUBROUTINE	CPU TIME (SEC)	PERCENT	NUMBER OF CALLS
* STSTAT	2.604	50.00	1
* TRAN	2.604	50.00	1
* CONTRL	2.604	50.00	2382
* ENERGY	2.604	50.00	190

* INDICATES OUTER LOOP TIME

TIME STEP CONTROL SUMMARY FOR 13 ACTUAL TIME STEPS. THE AVERAGE TIME STEP SIZE FOR THE INTERVAL WAS 7.692308E-02 SECONDS.
 NUMBER OF TIMES EACH TEST CONTROLLED TIME STEP SIZE

UPPER LIMIT	LOWER LIMIT	PRESSURE CHANGE	MASS CHANGE	ENERGY CHANGE	COURANT LIMIT	SAT LINE CROSSING	AIR MASS CHANGE	ZERO FLOW CROSSING	TRIP ACTUATION
0	0	0	0	0	13	0	0	0	0

VOLUMES CONTROLLING COURANT LIMIT
 (VOLUME INDEX ; TIMES CONTROLLING)

20; 13

MINET, TIME= 4.00000 TIME STEP=0.06566 STEP NO. 56
 MINIMUM TIME CONSTANT= 5.238E-01 SEC, LIMIT KEY= 101

SYSTEM BOUNDARY CONDITIONS:

ID	NETWORK	FLOW(KG/S)	ENTHALPY(MJ/KG)	PRESSURE(MPA)	TEMP(K)	FLUID
413	1	848.438	2.787225	5.447052	542.089	H2O
412	1	1272.697	1.899169	3.892000	521.547	H2O
414	1	0.000	2.790898	4.892000	535.337	H2O
416	1	0.000	2.779055	5.000000	536.694	H2O
411	1	424.241	2.787221	5.447052	542.089	H2O
403	2	181.930	2.740000	4.230394	526.486	H2O
406	2	181.905	1.598481	4.200000	526.054	H2O
401	3	1272.610	0.808470	3.133888	463.120	H2O
402	3	424.034	0.971289	5.769057	498.800	H2O
404	3	848.726	0.971289	5.768672	498.800	H2O

SYSTEM VOLUMES

ID	PRESSURE(MPA)	ENTHALPY(MJ/KG)	TEMP(K)	LEVEL(RELATIVE)	HEAT INPUT(MJ/S)	NETWORK	REGIONS
111	5.444953	2.787223	542.064	0.000000	0.000000	1	1
112	5.167510	2.787224	538.757	0.000000	0.000000	1	1
101	5.989363	0.971299	498.796	0.000000	0.000000	3	1

SYSTEM SEGMENTS

SEG	NETWK	WIN(KG/S)	WOUT(KG/S)	WBAR(KG/S)	ALPHA IS IN MPA*SEC*SEC/KG/KG		PIN(MPA)	POUT(MPA)	ALPHA, SEG	BETA(MPA)	CONNECTS TO:	
					EIN(MJ/KG)	EOUT(MJ/KG)					IN	OUT
1	1	848.438	848.438	848.438	2.787225	2.787225	5.447052	5.445089	0.235E-08	-0.000272	413	111
2	1	1272.686	1272.692	1272.689	2.787223	2.787222	5.444953	5.167510	0.171E-06	0.000000	111	112
3	1	1272.697	1272.697	1272.697	2.787224	1.899169	5.167510	3.892000	0.787E-06	0.000000	112	412
4	1	0.000	0.000	0.000	2.787224	2.790898	5.167639	4.892000	0.238E+09	0.000000	112	414
5	1	0.000	0.000	0.000	2.787223	2.779055	5.444817	5.000000	0.228E+09	-0.000392	111	416
6	1	424.241	424.241	424.241	2.787221	2.787221	5.447052	5.445089	0.939E-08	-0.000272	411	111
7	2	181.930	181.905	181.918	2.740000	1.598481	4.230394	4.200000	0.943E-06	0.000817	403	406
8	3	1272.610	1272.690	1272.642	0.808470	0.971455	3.133888	5.989363	0.214E-05	6.317969	401	101
9	3	424.032	424.034	424.033	0.971299	0.971289	5.989363	5.769057	0.137E-05	0.026170	101	402
10	3	848.723	848.726	848.725	0.971299	0.971289	5.989363	5.768672	0.343E-06	0.026170	101	404

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IN-SEGMENT DISTRIBUTIONS													JIN	JOUT
SEG	MODID	NODE	EIN(MJ/KG)	EBAR(MJ/KG)	EOUT(MJ/KG)	WIN(KG/S)	WOUT(KG/S)	TIN(K)	TBAR(K)	TOUT(K)	DENS(KG/M3)	QA(MJ/S)	JIN	JOUT
1	23	1	2.787225	2.787225	2.787225	848.438	848.438	542.077	542.077	542.077	27.715	0.000	1	2
2	22	2	2.787223	2.787222	2.787222	1272.686	1272.688	540.427	540.427	540.427	26.982	0.000	3	4
2	22	3	2.787222	2.787222	2.787222	1272.688	1272.690	540.427	540.427	540.427	26.982	0.000	4	5
2	22	4	2.787222	2.787222	2.787222	1272.690	1272.692	540.427	540.427	540.427	26.982	0.000	5	6
3	601	5	2.787224	2.343197	1.899169	1272.697	1272.697	530.611	530.611	530.611	30.978	-1130.224	7	8
4	502	6	2.787224	2.789061	2.790898	0.000	0.000	537.065	537.065	537.065	25.512	0.000	9	10
5	501	7	2.787223	2.783139	2.779055	0.000	0.000	539.422	539.422	539.422	26.609	0.000	11	12
6	21	8	2.787221	2.787221	2.787221	424.241	424.241	542.077	542.077	542.077	27.715	0.000	13	14
7	301	9	2.740000	2.169240	1.598481	181.930	181.905	526.270	526.270	526.270	33.171	-207.689	15	16
8	1	10	0.808470	0.808470	0.808470	1272.610	1272.610	462.949	462.949	462.949	876.723	0.000	17	18
8	201	11	0.808470	0.808470	0.808470	1272.610	1272.610	462.949	462.949	462.949	876.723	0.000	18	19
8	2	12	0.808470	0.808470	0.808470	1272.610	1272.610	462.949	462.949	462.949	876.723	0.000	19	20
8	301	13	0.808470	0.890021	0.971571	1272.610	1272.643	462.949	481.151	498.897	856.763	207.682	20	21
8	3	14	0.971571	0.971545	0.971519	1272.643	1272.664	498.897	498.891	498.886	835.585	0.000	21	22
8	3	15	0.971519	0.971487	0.971455	1272.664	1272.690	498.886	498.879	498.872	835.600	0.000	22	23
9	5	16	0.971299	0.971295	0.971291	424.032	424.033	498.799	498.798	498.797	836.930	0.000	24	25
9	5	17	0.971291	0.971290	0.971289	424.033	424.033	498.797	498.797	498.797	836.932	0.000	25	26
9	5	18	0.971289	0.971289	0.971289	424.033	424.034	498.797	498.797	498.797	836.932	0.000	26	27
10	4	19	0.971299	0.971295	0.971291	848.723	848.725	498.799	498.798	498.797	836.930	0.000	28	29
10	4	20	0.971291	0.971290	0.971289	848.725	848.726	498.797	498.797	498.797	836.931	0.000	29	30
10	4	21	0.971289	0.971289	0.971289	848.726	848.726	498.797	498.797	498.797	836.932	0.000	30	31

SYSTEM MODULES

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MODULE 1 IS B.C. NUMBER 1, MODID 413,NPATH= 0
MODULE 2 IS PIPE NUMBER 1, MODID 23,NPATH= 2
MODULE 3 IS VOL. NUMBER 1, MODID 111,NPATH= 1
MODULE 4 IS PIPE NUMBER 2, MODID 22,NPATH= 3
MODULE 5 IS VOL. NUMBER 2, MODID 112,NPATH= 1
MODULE 6 IS TBSG NUMBER 1, MODID 601,NPATH= 1
SPEED IN RPM IS 1800.00, EFFICIENCY IS 0.40395, POWER FROM GEN -1.074E+09 J/S
MODULE 7 IS B.C. NUMBER 2, MODID 412,NPATH= 0
MODULE 8 IS VALV NUMBER 1, MODID 502,NPATH= 1
RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.688E-04,AS DETERMINED USING OPTION 1
MODULE 9 IS B.C. NUMBER 3, MODID 414,NPATH= 0
MODULE 10 IS VALV NUMBER 2, MODID 501,NPATH= 1
RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.727E-04,AS DETERMINED USING OPTION 1
MODULE 11 IS B.C. NUMBER 4, MODID 416,NPATH= 0
MODULE 12 IS B.C. NUMBER 5, MODID 411,NPATH= 0
MODULE 13 IS PIPE NUMBER 3, MODID 21,NPATH= 1
MODULE 14 IS B.C. NUMBER 6, MODID 403,NPATH= 0
MODULE 15 IS H.X. NUMBER 1, MODID 301,NPATH= 1
THE HEAT FLUX AREA CORRECTION FACTOR IS 0.782411
T NOD I NOD O NOD QINR(KJ/S/M ) TINR(K) T TUBE(K) TOUTR(K) QOUTR(KJ/S/M ) MODE,I MODE,O T,CORE T,STRC
-----
1 13 9 9.97625 481.15134 493.29311 526.27028 -9.97666 1 6 481.2 526.3
MODULE 16 IS B.C. NUMBER 7, MODID 406,NPATH= 0
MODULE 17 IS B.C. NUMBER 8, MODID 401,NPATH= 0
MODULE 18 IS PIPE NUMBER 4, MODID 1,NPATH= 1
MODULE 19 IS PUMP NUMBER 1, MODID 201,NPATH= 2
PUMP SPEED= 3570.000 PUMP FLOW= 636.305 KG/S PUMP HEAD= 532.746 METERS
MODULE 20 IS PIPE NUMBER 5, MODID 2,NPATH= 1
MODULE 21 IS PIPE NUMBER 6, MODID 3,NPATH= 1
MODULE 22 IS VOL. NUMBER 3, MODID 101,NPATH= 1
MODULE 23 IS PIPE NUMBER 7, MODID 5,NPATH= 1
MODULE 24 IS B.C. NUMBER 9, MODID 402,NPATH= 0
MODULE 25 IS PIPE NUMBER 8, MODID 4,NPATH= 2
MODULE 26 IS B.C. NUMBER 10, MODID 404,NPATH= 0
    
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STANDARD TIME STEP NUMBER = 4 ACTUAL TIME STEP NUMBER = 56 TIME = 4.000000E+00 SECONDS

NORMALIZED CORE POWER	CORE POWER (MW)	THERMAL POWER (BTU/HR)	HEAT REMOV. RATE (BTU/HR)	ENERGY BALANCE (BTU)	WATER MASS BALANCE (LBM)	AIR MASS BALANCE (LBM)
1.000000E+00	2.300000E+03	7.891144E+09	0.000000E+00	4.117798E+08	8.921849E+05	3.306896E+03

VOLUME NUMBER	AVG. PRES. (PSIA)	TOT. MASS (LB)	AVG. ENTH. (BTU/LB)	AVG. DEN. (LB/FT3)	AVG. TEMP. (DEG. F)	AVG. QUAL.	BUBB. MASS (LB)	MIX. LEV. (FT)	LIQ. MASS (LB)
1	2.28151E+03	4.02949E+04	6.20386E+02	4.26853E+01	6.04462E+02	0.00000E+00	0.00000E+00	1.16700E+01	4.02949E+04
2	2.25703E+03	8.14902E+03	6.20342E+02	4.26650E+01	6.04365E+02	0.00000E+00	0.00000E+00	3.59000E+00	8.14902E+03
3	2.25801E+03	1.14636E+04	6.20383E+02	4.26632E+01	6.04396E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.14636E+04
4	2.25128E+03	9.88034E+03	6.00274E+02	4.39517E+01	5.90268E+02	0.00000E+00	0.00000E+00	1.05400E+01	9.88034E+03
5	2.24446E+03	1.01369E+04	5.81394E+02	4.50929E+01	5.76437E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.01369E+04
7	2.23596E+03	2.08778E+04	5.57705E+02	4.64365E+01	5.58355E+02	0.00000E+00	0.00000E+00	9.40500E+00	2.08778E+04
8	2.23387E+03	1.05497E+04	5.48585E+02	4.69295E+01	5.51192E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.05497E+04
9	2.23386E+03	1.06217E+04	5.42542E+02	4.72496E+01	5.46387E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.06217E+04
10	2.23560E+03	1.26960E+04	5.42559E+02	4.72498E+01	5.46405E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.26960E+04
11	2.22701E+03	1.23406E+04	5.42541E+02	4.72456E+01	5.46375E+02	0.00000E+00	0.00000E+00	1.20500E+01	1.23406E+04
12	2.27445E+03	1.81446E+04	5.42966E+02	4.72515E+01	5.46799E+02	0.00000E+00	0.00000E+00	5.19000E+00	1.81446E+04
13	2.30897E+03	7.63947E+03	5.42926E+02	4.72740E+01	5.46830E+02	0.00000E+00	0.00000E+00	2.29000E+00	7.63947E+03
14	2.30095E+03	8.69724E+03	5.42958E+02	4.72676E+01	5.46841E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69724E+03
15	2.30079E+03	8.69711E+03	5.42969E+02	4.72669E+01	5.46849E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69711E+03
16	2.30331E+03	8.69728E+03	5.42980E+02	4.72678E+01	5.46863E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69728E+03
17	2.30190E+03	3.44096E+04	5.43000E+02	4.72659E+01	5.46876E+02	0.00000E+00	0.00000E+00	9.79000E+00	3.44096E+04
18	2.29632E+03	7.58852E+03	5.69876E+02	4.57967E+01	5.67866E+02	0.00000E+00	0.00000E+00	4.02000E+00	7.58852E+03
19	2.29204E+03	7.30604E+03	5.98560E+02	4.40920E+01	5.89140E+02	0.00000E+00	0.00000E+00	4.00000E+00	7.30604E+03
20	2.28769E+03	7.04130E+03	6.23350E+02	4.24943E+01	6.06505E+02	0.00000E+00	0.00000E+00	4.10000E+00	7.04130E+03
21	2.29761E+03	2.00872E+03	5.42987E+02	4.72641E+01	5.46858E+02	0.00000E+00	0.00000E+00	1.21000E+01	2.00872E+03
22	2.27943E+03	2.42700E+04	5.42961E+02	4.72547E+01	5.46804E+02	0.00000E+00	0.00000E+00	7.67000E+00	2.42700E+04
23	2.25713E+03	4.07452E+03	6.20342E+02	4.26651E+01	6.04365E+02	0.00000E+00	0.00000E+00	3.59000E+00	4.07452E+03
24	2.25810E+03	5.73395E+03	6.20383E+02	4.26633E+01	6.04396E+02	0.00000E+00	0.00000E+00	5.91000E+00	5.73395E+03
25	2.25138E+03	4.94019E+03	6.00272E+02	4.39519E+01	5.90267E+02	0.00000E+00	0.00000E+00	1.05400E+01	4.94019E+03
26	2.24455E+03	5.06847E+03	5.81392E+02	4.50931E+01	5.76436E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.06847E+03
28	2.23605E+03	1.04389E+04	5.57704E+02	4.64366E+01	5.58354E+02	0.00000E+00	0.00000E+00	9.40500E+00	1.04389E+04
29	2.23397E+03	5.27488E+03	5.48584E+02	4.69296E+01	5.51191E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.27488E+03
30	2.23395E+03	5.31086E+03	5.42542E+02	4.72497E+01	5.46388E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.31086E+03
31	2.23570E+03	6.35037E+03	5.42560E+02	4.72498E+01	5.46405E+02	0.00000E+00	0.00000E+00	5.91000E+00	6.35037E+03
32	2.22710E+03	6.17028E+03	5.42542E+02	4.72456E+01	5.46375E+02	0.00000E+00	0.00000E+00	1.20500E+01	6.17028E+03
33	2.27455E+03	9.07229E+03	5.42966E+02	4.72515E+01	5.46800E+02	0.00000E+00	0.00000E+00	5.19000E+00	9.07229E+03
34	2.30906E+03	3.81974E+03	5.42926E+02	4.72740E+01	5.46830E+02	0.00000E+00	0.00000E+00	2.29000E+00	3.81974E+03
35	2.30104E+03	4.34390E+03	5.42958E+02	4.72676E+01	5.46841E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.34390E+03
36	2.30089E+03	4.34383E+03	5.42969E+02	4.72670E+01	5.46850E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.34383E+03
37	2.30340E+03	4.34392E+03	5.42980E+02	4.72679E+01	5.46863E+02	0.00000E+00	0.00000E+00	8.62000E+00	4.34392E+03
39	LIQ REG VAP REG	2.24999E+03	2.85793E+04	7.01237E+02	3.66402E+01	6.54077E+02	1.52765E-06	4.36590E-02	2.85792E+04
			3.25491E+03	1.11784E+03	6.25939E+00	6.54077E+02	9.99997E-01	3.25490E+03	8.64773E-03
40		2.25594E+03	1.50175E+03	6.20351E+02	4.26634E+01	6.04368E+02	0.00000E+00	0.00000E+00	9.23000E+00
101		8.30121E+02	1.03231E+05	5.47266E+02	1.18293E+01	5.22041E+02	4.71510E-02	2.41109E+03	3.82518E+01
131		8.21199E+02	2.44840E+02	1.19831E+03	1.80030E+00	5.20789E+02	9.99268E-01	2.44661E+02	3.24200E+01
132		8.03968E+02	8.04033E+02	1.19831E+03	1.76130E+00	5.18343E+02	9.98574E-01	8.02886E+02	1.36300E+01
201		8.30064E+02	2.06430E+05	5.47264E+02	2.18260E+01	5.22033E+02	4.71610E-02	4.82307E+03	3.82516E+01
231		8.21143E+02	4.89645E+02	1.19831E+03	1.80017E+00	5.20782E+02	9.99268E-01	4.89286E+02	3.24200E+01
232		8.03967E+02	1.53232E+03	1.19831E+03	1.76129E+00	5.18343E+02	9.98576E-01	1.53014E+03	1.36300E+01
500		6.14679E+02	1.11384E+05	4.80058E+01	4.51859E+01	8.00000E+01	1.01518E-05	0.00000E+00	1.23900E+01
501		6.14679E+02	5.56918E+04	4.80058E+01	4.51859E+01	8.00000E+01	1.01518E-05	0.00000E+00	5.56913E+04

701	8.36729E+02	6.08154E+03	4.17433E+02	5.22469E+01	4.38315E+02	0.00000E+00	0.00000E+00	2.00000E+00	6.08154E+03
801	8.36673E+02	1.21631E+04	4.17434E+02	5.22468E+01	4.38316E+02	0.00000E+00	0.00000E+00	2.00000E+00	1.21631E+04
900	1.47000E+01	6.44163E+04	1.18996E+03	3.30340E-02	3.00000E+02	1.00000E+00	6.44163E+04	0.00000E+00	0.00000E+00
901	7.90028E+02	1.75409E+00	1.19829E+03	1.72987E+00	5.16335E+02	9.97997E-01	1.75058E+00	1.36300E+01	3.51428E-03
902	7.90028E+02	3.50818E+00	1.19829E+03	1.72987E+00	5.16335E+02	9.97999E-01	3.50116E+00	1.36300E+01	7.01966E-03

JUNCTION NUMBER	CONNECTS VOLUMES	CHOKE MODE	JUN. FLOW (LB/SEC)	JUN. ENTH. (BTU/LB)	JUN. SPVL. (FT3/LB)	P R E S S U R E				D I F F E R E N T I A L S	
						STAG. PSI	ELEV. PSI	FRIC. PSI	ACCL. PSI	PUMP PSI	
1	1 TO 2		1.87779E+04	6.20343E+02	2.34256E-02	1.43599E+01	1.33474E-01	-1.44934E+01	4.85643E-06	0.00000E+00	
2	2 TO 3		1.87779E+04	6.20341E+02	2.34387E-02	9.45085E+00	-9.36234E-01	-8.51461E+00	4.58422E-06	0.00000E+00	
3	3 TO 4		1.87779E+04	6.20372E+02	2.34394E-02	5.04209E+00	-2.48400E+00	-2.55810E+00	1.14492E-06	0.00000E+00	
4	4 TO 5		1.87779E+04	6.00267E+02	2.27535E-02	6.92140E+00	-3.25879E+00	-3.66261E+00	1.86725E-06	0.00000E+00	
5	5 TO 7		1.87779E+04	5.81388E+02	2.21775E-02	8.60429E+00	-3.14618E+00	-5.45810E+00	2.68549E-06	0.00000E+00	
7	7 TO 8		1.87778E+04	5.57711E+02	2.15356E-02	2.12468E+00	3.21299E+00	-5.33767E+00	2.79089E-06	0.00000E+00	
8	8 TO 9		1.87778E+04	5.48592E+02	2.13087E-02	3.83762E-02	3.44669E+00	-3.48507E+00	1.86867E-06	0.00000E+00	
9	9 TO 10		1.87778E+04	5.42549E+02	2.11643E-02	-1.17316E-01	2.69881E+00	-2.58149E+00	9.89880E-07	0.00000E+00	
10	10 TO 11		1.87778E+04	5.42534E+02	2.11633E-02	1.39927E+00	2.47717E+00	-3.87644E+00	3.78091E-06	0.00000E+00	
11	11 TO 12		1.87778E+04	5.42542E+02	2.11661E-02	-4.22965E+01	-7.74409E-01	-2.01965E+00	6.04640E-06	4.50905E+01	
12	12 TO 13		1.87778E+04	5.42926E+02	2.11626E-02	-4.41793E+01	-4.72514E-01	-4.38712E-01	5.30117E-06	4.50905E+01	
13	13 TO 14		1.87778E+04	5.42926E+02	2.11534E-02	1.65012E+01	-5.41608E-01	-1.59596E+01	1.69814E-06	0.00000E+00	
14	14 TO 15		1.87440E+04	5.42963E+02	2.11559E-02	1.75918E-01	2.83275E+00	-3.00867E+00	4.54646E-07	0.00000E+00	
15	15 TO 16		1.87440E+04	5.42975E+02	2.11562E-02	-2.51267E+00	2.82948E+00	-3.16803E-01	9.11772E-08	0.00000E+00	
16	16 TO 17		1.87440E+04	5.42986E+02	2.11558E-02	4.26112E+00	1.97275E+00	-6.23388E+00	-6.28360E-08	0.00000E+00	
17	17 TO 18		2.71302E+04	5.42991E+02	2.11571E-02	4.89172E+00	-2.24596E+00	-2.64576E+00	-1.78532E-07	0.00000E+00	
18	18 TO 19		2.71302E+04	5.69874E+02	2.18360E-02	4.20036E+00	-1.25163E+00	-2.94872E+00	-1.24406E-07	0.00000E+00	
19	19 TO 20		2.71302E+04	5.98557E+02	2.26803E-02	4.26773E+00	-1.21734E+00	-3.05039E+00	-1.49248E-07	0.00000E+00	
20	20 TO 1		2.71302E+04	6.23348E+02	2.35332E-02	6.94529E+00	-2.27544E+00	-4.66985E+00	-1.68538E-07	0.00000E+00	
21	21 TO 1		9.85799E+02	5.42975E+02	2.11581E-02	1.56611E+01	-3.65949E+00	-1.20016E+01	-2.39906E-07	0.00000E+00	
22	22 TO 1		5.07008E+01	5.42965E+02	2.11618E-02	-2.68598E+00	2.69268E+00	-6.70025E-03	-9.74129E-08	0.00000E+00	
23	23 TO 24		9.38893E+03	6.20341E+02	2.34386E-02	9.45083E+00	-9.36236E-01	-8.51459E+00	5.67485E-06	0.00000E+00	
24	24 TO 25		9.38893E+03	6.20372E+02	2.34394E-02	5.04210E+00	-2.48400E+00	-2.55809E+00	1.41179E-06	0.00000E+00	
25	25 TO 26		9.38893E+03	6.00265E+02	2.27534E-02	6.92141E+00	-3.25880E+00	-3.66260E+00	2.33195E-06	0.00000E+00	
26	26 TO 28		9.38893E+03	5.81385E+02	2.21774E-02	8.60428E+00	-3.14619E+00	-5.45808E+00	3.34410E-06	0.00000E+00	
28	28 TO 29		9.38892E+03	5.57710E+02	2.15355E-02	2.12467E+00	3.21299E+00	-5.33766E+00	3.29937E-06	0.00000E+00	
29	29 TO 30		9.38892E+03	5.48591E+02	2.13087E-02	3.83688E-02	3.44670E+00	-3.48507E+00	2.15470E-06	0.00000E+00	
30	30 TO 31		9.38892E+03	5.42549E+02	2.11643E-02	-1.17319E-01	2.69881E+00	-2.58149E+00	1.13398E-06	0.00000E+00	
31	31 TO 32		9.38891E+03	5.42534E+02	2.11633E-02	1.39927E+00	2.47718E+00	-3.87644E+00	4.34534E-06	0.00000E+00	
32	32 TO 33		9.38891E+03	5.42542E+02	2.11660E-02	-4.22965E+01	-7.74409E-01	-2.01965E+00	5.78153E-06	4.50906E+01	
33	33 TO 34		9.38890E+03	5.42926E+02	2.11625E-02	-4.41794E+01	-4.72514E-01	-4.38712E-01	5.10348E-06	4.50906E+01	
34	34 TO 35		9.38890E+03	5.42926E+02	2.11534E-02	1.65012E+01	-5.41609E-01	-1.59596E+01	2.73083E-06	0.00000E+00	
35	35 TO 36		9.37200E+03	5.42963E+02	2.11559E-02	1.75915E-01	2.83276E+00	-3.00867E+00	8.97004E-07	0.00000E+00	
36	36 TO 37		9.37200E+03	5.42975E+02	2.11562E-02	-2.51432E+00	2.83112E+00	-3.16803E-01	5.91917E-07	0.00000E+00	
37	37 TO 17		9.37200E+03	5.42986E+02	2.11558E-02	4.24916E+00	1.97111E+00	-6.22028E+00	3.69149E-07	0.00000E+00	
39	39 TO 40		1.05950E-01	7.01237E+02	2.72868E-02	-5.94277E+00	5.94316E+00	-2.64457E-07	3.86897E-04	0.00000E+00	
40	40 TO 23		1.19352E-01	6.20357E+02	2.34388E-02	-1.19353E+00	1.19398E+00	-1.37757E-07	4.49170E-04	0.00000E+00	
42	17 TO 21		9.85799E+02	5.42994E+02	2.11572E-02	4.77714E+00	-3.59246E+00	-1.18467E+00	-1.81879E-07	0.00000E+00	
43	1 TO 23		9.38881E+03	6.20343E+02	2.34256E-02	1.43651E+01	1.33473E-01	-1.44986E+01	-1.65289E-05	0.00000E+00	
44	35 TO 22		1.69000E+01	5.42900E+02	2.11551E-02	2.83636E+01	-2.67487E+00	-2.56887E+01	5.09803E-07	0.00000E+00	
45	14 TO 22		3.38000E+01	5.42900E+02	2.11552E-02	2.82684E+01	-2.67487E+00	-2.55935E+01	4.68822E-07	0.00000E+00	
75	23 TO 900		0.00000E+00	6.20389E+02	2.34399E-02	0.00000E+00	1.54677E-01	0.00000E+00	0.00000E+00	0.00000E+00	
100	701 TO 101		9.34701E+02	4.17436E+02	1.91400E-02	8.23347E+00	-5.98632E+00	-2.24699E+00	1.59209E-04	0.00000E+00	
101	101 TO 131		9.35282E+02	1.19855E+03	5.50695E-01	3.65359E+00	-1.64746E+00	-2.00616E+00	-2.63827E-05	0.00000E+00	
131	131 TO 132		9.35284E+02	1.19611E+03	5.53844E-01	1.69995E+01	2.86014E-01	-1.72856E+01	-1.00129E-04	0.00000E+00	
200	801 TO 201		1.87085E+03	4.17437E+02	1.91400E-02	8.23650E+00	-5.98577E-01	-2.25055E+00	2.55410E-04	0.00000E+00	
201	201 TO 231		1.87047E+03	1.19855E+03	5.50735E-01	3.65290E+00	-1.64686E+00	-2.00609E+00	-4.98600E-05	0.00000E+00	
231	231 TO 232		1.87047E+03	1.19612E+03	5.53884E-01	1.69461E+01	2.85999E-01	-1.72322E+01	-1.54743E-04	0.00000E+00	
500	500 TO 13		0.00000E+00	5.42973E+02	2.11544E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00	
501	501 TO 34		0.00000E+00	5.42973E+02	2.11544E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00	
901	132 TO 901		9.35291E+02	1.19829E+03	5.68518E-01	1.34569E+01	1.48725E-03	-1.34581E+01	3.29388E-04	0.00000E+00	
902	232 TO 902		1.87048E+03	1.19829E+03	5.68481E-01	1.34555E+01	1.48709E-03	-1.34567E+01	2.98712E-04	0.00000E+00	

800	0 TO 801	1.87112E+03	4.17252E+02	1.91373E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
700	0 TO 701	9.34834E+02	4.17251E+02	1.91373E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
601	0 TO 36	0.00000E+00	5.42982E+02	2.11567E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
600	0 TO 15	0.00000E+00	5.42982E+02	2.11568E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
290	0 TO 201	0.00000E+00	5.17232E+02	2.17700E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
254	0 TO 232	0.00000E+00	1.19888E+03	5.68157E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
253	0 TO 232	0.00000E+00	1.19888E+03	5.68157E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
252	0 TO 232	0.00000E+00	1.19888E+03	5.68157E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
251	0 TO 232	0.00000E+00	1.19888E+03	5.68157E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
235	0 TO 232	0.00000E+00	1.19888E+03	5.68157E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
234	0 TO 232	0.00000E+00	1.19888E+03	5.68157E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
232	0 TO 232	0.00000E+00	1.19888E+03	5.90342E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
190	0 TO 101	0.00000E+00	5.17241E+02	2.17697E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
154	0 TO 132	0.00000E+00	1.19888E+03	5.68154E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
153	0 TO 132	0.00000E+00	1.19888E+03	5.68154E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
152	0 TO 132	0.00000E+00	1.19888E+03	5.68154E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
151	0 TO 132	0.00000E+00	1.19888E+03	5.68154E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
135	0 TO 132	0.00000E+00	1.19888E+03	5.68154E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
134	0 TO 132	0.00000E+00	1.19888E+03	5.68154E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
132	0 TO 132	0.00000E+00	1.19840E+03	5.90342E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
95	0 TO 34	0.00000E+00	5.42971E+02	2.11544E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
94	0 TO 13	0.00000E+00	5.42971E+02	2.11544E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
92	0 TO 13	0.00000E+00	5.42973E+02	2.11544E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

PUMP NUMBER	VOLUME NUMBER	PUMP SPEED (RPM)	NORM. PUMP TORQUE	NORM. FRIC. TORQUE	NORM. MOT. TORQUE	POWER TO H20 (BTU/HR)
1	33	1.19000E+03	9.97562E-01	1.00000E+00	0.00000E+00	1.37479E+07
2	12	1.19000E+03	9.97560E-01	1.00000E+00	0.00000E+00	2.74957E+07

HEAT COND. NUMBER	VOL. NUM.	H.T. MODE	SURF. FLUX (BTU/HR-FT2)	CRIT. FLUX (BTU/HR-FT2)	H.T. COEF. (BTU/H-F2-F)	SURF. TEMP. (DEG. F)	MASS FLUX (LBM/HR-FT2)	STORD ENRGY (BTU)	POWR TO H20 (BTU/HR)
1	RIGHT 18	1	1.84648E+05	1.19235E+06	5.72837E+03	6.00100E+02	2.35801E+06	7.23050E+06	2.62611E+09
2	RIGHT 19	1	1.97017E+05	1.15766E+06	5.83990E+03	6.22876E+02	2.35801E+06	7.68589E+06	2.80202E+09
3	RIGHT 20	1	1.70281E+05	1.12976E+06	5.94333E+03	6.35156E+02	2.35801E+06	7.05712E+06	2.42177E+09
16	RIGHT 2	1	5.79674E-02	1.15168E+06	6.52951E+03	6.04365E+02	7.36387E+06	2.59328E+06	1.71583E+01
17	RIGHT 3	1	1.83029E-02	1.15106E+06	1.01191E+03	6.04396E+02	8.98463E+05	8.22283E+06	5.00877E+01
18	RIGHT 10	1	1.13439E+00	1.26820E+06	9.60271E+02	5.46406E+02	8.98460E+05	7.36861E+06	3.10436E+03
19	RIGHT 11	1	5.39074E+00	1.27346E+06	5.50280E+03	5.46376E+02	6.45039E+06	3.60621E+06	2.36114E+03
20	RIGHT 12	1	2.15240E+00	1.24335E+06	3.18977E+03	5.46800E+02	3.52084E+06	1.75118E+07	7.60660E+02
21	RIGHT 13	1	2.13787E+00	1.22101E+06	6.82997E+03	5.46831E+02	8.20389E+06	1.91579E+06	5.47294E+02
22	RIGHT 14	1	1.87681E+00	1.22624E+06	5.19015E+03	5.46841E+02	4.37824E+06	7.16016E+06	4.54938E+02
23	RIGHT 15	1	1.30146E+00	1.22633E+06	5.18272E+03	5.46850E+02	4.37036E+06	7.16029E+06	3.15474E+02
24	RIGHT 16	1	8.73042E-01	1.22466E+06	5.18269E+03	5.46863E+02	4.37036E+06	7.16048E+06	2.11625E+02
25	RIGHT 17	1	1.61543E-01	1.22556E+06	2.06937E+03	5.46876E+02	1.36118E+06	4.36586E+06	4.48605E+01
26	RIGHT 23	1	5.74125E-02	1.15163E+06	6.52951E+03	6.04365E+02	7.36387E+06	1.29664E+06	8.49706E+00
27	RIGHT 24	1	1.82137E-02	1.15100E+06	1.01191E+03	6.04396E+02	8.98462E+05	4.11142E+06	2.49217E+01
28	RIGHT 31	1	9.65169E-01	1.26814E+06	9.60271E+02	5.46406E+02	8.98461E+05	3.68431E+06	1.32064E+03
29	RIGHT 32	1	4.61089E+00	1.27340E+06	5.50280E+03	5.46376E+02	6.45039E+06	1.80310E+06	1.00978E+03
30	RIGHT 33	1	1.86943E+00	1.24329E+06	3.18977E+03	5.46800E+02	3.52084E+06	8.75590E+06	3.30329E+02
31	RIGHT 34	1	1.85497E+00	1.22094E+06	6.82997E+03	5.46831E+02	8.20389E+06	9.57898E+05	2.37436E+02
32	RIGHT 35	1	1.66221E+00	1.22618E+06	5.19015E+03	5.46841E+02	4.37824E+06	3.58008E+06	2.01459E+02
33	RIGHT 36	1	1.16788E+00	1.22626E+06	5.18272E+03	5.46850E+02	4.37036E+06	3.58014E+06	1.41547E+02
34	RIGHT 37	1	7.95172E-01	1.22460E+06	5.18269E+03	5.46863E+02	4.37036E+06	3.58024E+06	9.63748E+01
35	RIGHT 22	1	4.81841E-04	1.24018E+06	1.16855E+01	5.46804E+02	3.03545E+03	9.74428E+06	1.17184E-01
4	LEFT 4	1	-1.14882E+05	1.18021E+06	6.76684E+03	5.73291E+02	3.16777E+06		-1.35820E+09
	RIGHT 201	11	1.01757E+05	1.52746E+06	1.07932E+04	5.31461E+02	3.81162E+04	1.73758E+06	1.35821E+09
5	LEFT 5	1	-8.88836E+04	1.20898E+06	6.68131E+03	5.63134E+02	3.16777E+06		-1.27538E+09
	RIGHT 201	11	7.87285E+04	1.52746E+06	9.09628E+03	5.30688E+02	3.81162E+04	2.08797E+06	1.27539E+09
6	LEFT 7	1	-5.57825E+04	1.24650E+06	6.57800E+03	5.49875E+02	3.16777E+06		-8.00315E+08
	RIGHT 201	11	4.94096E+04	1.52746E+06	6.66782E+03	5.29443E+02	3.81162E+04	2.04276E+06	8.00328E+08

9	LEFT	9	1	-3.46341E+04	1.26929E+06	6.51298E+03	5.41070E+02	3.16777E+06			-4.09461E+08
	RIGHT	201	11	3.06777E+04	1.52746E+06	4.85278E+03	5.28355E+02	3.81162E+04	1.67880E+06		4.09474E+08
8	LEFT	8	1	-4.30290E+04	1.26064E+06	6.53886E+03	5.44611E+02	3.16777E+06			-6.17419E+08
	RIGHT	201	11	3.81134E+04	1.52746E+06	5.60825E+03	5.28829E+02	3.81162E+04	2.04683E+06		6.17433E+08
7	LEFT	7	1	-5.57825E+04	1.24650E+06	6.57800E+03	5.49875E+02	3.16777E+06			-8.00315E+08
	RIGHT	201	11	4.94096E+04	1.52746E+06	6.66782E+03	5.29443E+02	3.81162E+04	2.04276E+06		8.00328E+08
10	LEFT	25	1	-1.14866E+05	1.18015E+06	6.76683E+03	5.73292E+02	3.16777E+06			-6.79154E+08
	RIGHT	101	11	1.01742E+05	1.52747E+06	1.07924E+04	5.31468E+02	3.81024E+04	8.68795E+05		6.79159E+08
11	LEFT	26	1	-8.88668E+04	1.20893E+06	6.68130E+03	5.63135E+02	3.16777E+06			-6.37712E+08
	RIGHT	101	11	7.87136E+04	1.52747E+06	9.09530E+03	5.30695E+02	3.81024E+04	1.04400E+06		6.37718E+08
12	LEFT	28	1	-5.57675E+04	1.24644E+06	6.57799E+03	5.49876E+02	3.16777E+06			-4.00138E+08
	RIGHT	101	11	4.93962E+04	1.52747E+06	6.66673E+03	5.29450E+02	3.81024E+04	1.02139E+06		4.00144E+08
15	LEFT	30	1	-3.46216E+04	1.26923E+06	6.51298E+03	5.41072E+02	3.16777E+06			-2.04702E+08
	RIGHT	101	11	3.06665E+04	1.52747E+06	4.85170E+03	5.28362E+02	3.81024E+04	8.39408E+05		2.04708E+08
14	LEFT	29	1	-4.30153E+04	1.26058E+06	6.53885E+03	5.44613E+02	3.16777E+06			-3.08679E+08
	RIGHT	101	11	3.81011E+04	1.52747E+06	5.60715E+03	5.28836E+02	3.81024E+04	1.02342E+06		3.08686E+08
13	LEFT	28	1	-5.57675E+04	1.24644E+06	6.57799E+03	5.49876E+02	3.16777E+06			-4.00138E+08
	RIGHT	101	11	4.93962E+04	1.52747E+06	6.66673E+03	5.29450E+02	3.81024E+04	1.02139E+06		4.00144E+08

CORE SECT. NUMBER	HEAT COND. NUMBER	DEPTH REAC. EXT. ZR-H2O (FT)	DEPTH REAC. INT. ZR-H2O (FT)	HEAT GEN. ZR-H2O (BTU/HR)	COND. HEAT- ING RATE (BTU/HR)	DIR. MODER- ATOR HT RT (BTU/HR)	AVG. METAL TEMPERATURE (DEG. F)	CENTERLINE TEMPERATURE (DEG. F)
1	1	0.00000E+00	0.00000E+00	0.00000E+00	2.62611E+09	0.00000E+00	1.52207E+03	1.99764E+03
2	2	0.00000E+00	0.00000E+00	0.00000E+00	2.80202E+09	0.00000E+00	1.61303E+03	2.14152E+03
3	3	0.00000E+00	0.00000E+00	0.00000E+00	2.42177E+09	0.00000E+00	1.47730E+03	1.90598E+03

CONTEXT SAVE AT 4.00000 SECONDS STEP NO. 56

WRITTEN TO UNIT NUMBER 34

DATA RECORD NUMBER 5 WAS WRITTEN ON TAPE VSN = , DENSITY = PE, CREATED ON 90159
AND WAS LABELED RETRAN1

TIMING EDIT ACCUMULATED TIME = 7.813 SECONDS

SUBROUTINE	CPU TIME (SEC)	PERCENT	NUMBER OF CALLS
*****	*****	*****	*****
* STSTAT	2.604	33.33	1
* TRAN	5.208	66.67	1
DIRSOL	2.604	33.33	336
* CONTRL	2.604	33.33	3006
* ENERGY	5.208	66.67	242
* INDICATES OUTER LOOP TIME			

TIME STEP CONTROL SUMMARY FOR 13 ACTUAL TIME STEPS. THE AVERAGE TIME STEP SIZE FOR THE INTERVAL WAS 7.692308E-02 SECONDS.

NUMBER OF TIMES EACH TEST CONTROLLED TIME STEP SIZE

UPPER LIMIT	LOWER LIMIT	PRESSURE CHANGE	MASS CHANGE	ENERGY CHANGE	COURANT LIMIT	SAT LINE CROSSING	AIR MASS CHANGE	ZERO FLOW CROSSING	TRIP ACTUATION
0	0	0	0	0	13	0	0	0	0

VOLUMES CONTROLLING COURANT LIMIT
 (VOLUME INDEX ; TIMES CONTROLLING)

20; 13

MINET, TIME= 5.00000 TIME STEP=0.06566 STEP NO. 69
 MINIMUM TIME CONSTANT= 5.238E-01 SEC, LIMIT KEY= 101

SYSTEM BOUNDARY CONDITIONS:

ID	NETWORK	FLOW(KG/S)	ENTHALPY(MJ/KG)	PRESSURE(MPA)	TEMP(K)	FLUID
413	1	848.420	2.787225	5.447010	542.088	H2O
412	1	1272.676	1.899183	3.892000	521.547	H2O
414	1	0.000	2.790898	4.892000	535.337	H2O
416	1	0.000	2.779054	5.000000	536.694	H2O
411	1	424.235	2.787221	5.447010	542.088	H2O
403	2	181.930	2.740000	4.230398	526.486	H2O
406	2	181.934	1.598469	4.200000	526.054	H2O
401	3	1272.610	0.808470	3.133829	463.120	H2O
402	3	424.031	0.971289	5.769013	498.800	H2O
404	3	848.727	0.971289	5.768626	498.800	H2O

SYSTEM VOLUMES

ID	PRESSURE(MPA)	ENTHALPY(MJ/KG)	TEMP(K)	LEVEL(RELATIVE)	HEAT INPUT(MJ/S)	NETWORK	REGIONS
111	5.444911	2.787223	542.064	0.000000	0.000000	1	1
112	5.167473	2.787221	538.756	0.000000	0.000000	1	1
101	5.989318	0.971307	498.797	0.000000	0.000000	3	1

SYSTEM SEGMENTS		ALPHA IS IN MPA*SEC*SEC/KG/KG										CONNECTS TO:	
SEG	NETWK	WIN(KG/S)	WOUT(KG/S)	WBAR(KG/S)	EIN(MJ/KG)	EOUT(MJ/KG)	PIN(MPA)	POUT(MPA)	ALPHA, SEG	BETA(MPA)	IN	OUT	
1	1	848.420	848.420	848.420	2.787225	2.787225	5.447010	5.445047	0.235E-08	-0.000272	413	111	
2	1	1272.664	1272.670	1272.667	2.787223	2.787222	5.444911	5.167473	0.171E-06	0.000000	111	112	
3	1	1272.676	1272.676	1272.676	2.787222	1.899183	5.167473	3.892000	0.787E-06	0.000000	112	412	
4	1	0.000	0.000	0.000	2.787222	2.790898	5.167602	4.892000	0.238E+09	0.000000	112	414	
5	1	0.000	0.000	0.000	2.787223	2.779054	5.444775	5.000000	0.228E+09	-0.000392	111	416	
6	1	424.235	424.235	424.235	2.787221	2.787221	5.447010	5.445047	0.939E-08	-0.000272	411	111	
7	2	181.930	181.934	181.932	2.740000	1.598469	4.230398	4.200000	0.943E-06	0.000817	403	406	
8	3	1272.610	1272.668	1272.632	0.808470	0.971506	3.133829	5.989318	0.214E-05	6.317970	401	101	
9	3	424.029	424.031	424.030	0.971306	0.971289	5.989318	5.769013	0.137E-05	0.026170	101	402	
10	3	848.722	848.727	848.725	0.971306	0.971289	5.989318	5.768626	0.343E-06	0.026170	101	404	

IN-SEGMENT DISTRIBUTIONS														
SEG	MODID	NODE	EIN(MJ/KG)	EBAR(MJ/KG)	EOUT(MJ/KG)	WIN(KG/S)	WOUT(KG/S)	TIN(K)	TBAR(K)	TOUT(K)	DENS(KG/M3)	QA(MJ/S)	JIN	JOUT
1	23	1	2.787225	2.787225	2.787225	848.420	848.420	542.077	542.077	542.077	27.714	0.000	1	2
2	22	2	2.787223	2.787222	2.787222	1272.664	1272.666	540.426	540.426	540.426	26.982	0.000	3	4
2	22	3	2.787222	2.787222	2.787222	1272.666	1272.668	540.426	540.426	540.426	26.982	0.000	4	5
2	22	4	2.787222	2.787222	2.787222	1272.668	1272.670	540.426	540.426	540.426	26.982	0.000	5	6
3	601	5	2.787222	2.343202	1.899183	1272.676	1272.676	530.611	530.611	530.611	30.978	-1130.186	7	8
4	502	6	2.787222	2.789060	2.790898	0.000	0.000	537.065	537.065	537.065	25.512	0.000	9	10
5	501	7	2.787223	2.783138	2.779054	0.000	0.000	539.422	539.422	539.422	26.609	0.000	11	12
6	21	8	2.787221	2.787221	2.787221	424.235	424.235	542.077	542.077	542.077	27.715	0.000	13	14
7	301	9	2.740000	2.169234	1.598469	181.930	181.934	526.270	526.270	526.270	33.171	-207.676	15	16
8	1	10	0.808470	0.808470	0.808470	1272.610	1272.610	462.949	462.949	462.949	876.723	0.000	17	18
8	201	11	0.808470	0.808470	0.808470	1272.610	1272.610	462.949	462.949	462.949	876.723	0.000	18	19
8	2	12	0.808470	0.808470	0.808470	1272.610	1272.610	462.949	462.949	462.949	876.723	0.000	19	20
8	301	13	0.808470	0.890033	0.971595	1272.610	1272.631	462.949	481.154	498.902	856.759	207.671	20	21
8	3	14	0.971595	0.971577	0.971558	1272.631	1272.647	498.902	498.898	498.894	835.576	0.000	21	22
8	3	15	0.971558	0.971532	0.971506	1272.647	1272.668	498.894	498.888	498.883	835.588	0.000	22	23
9	5	16	0.971306	0.971300	0.971294	424.029	424.030	498.800	498.799	498.798	836.929	0.000	24	25
9	5	17	0.971294	0.971292	0.971290	424.030	424.031	498.798	498.797	498.797	836.931	0.000	25	26
9	5	18	0.971290	0.971290	0.971289	424.031	424.031	498.797	498.797	498.797	836.932	0.000	26	27
10	4	19	0.971306	0.971300	0.971294	848.722	848.725	498.800	498.799	498.798	836.929	0.000	28	29
10	4	20	0.971294	0.971292	0.971290	848.725	848.726	498.798	498.797	498.797	836.931	0.000	29	30
10	4	21	0.971290	0.971290	0.971289	848.726	848.727	498.797	498.797	498.797	836.931	0.000	30	31

SYSTEM MODULES

MODULE 1 IS B.C. NUMBER 1, MODID 413, NPATH= 0
 MODULE 2 IS PIPE NUMBER 1, MODID 23, NPATH= 2
 MODULE 3 IS VOL. NUMBER 1, MODID 111, NPATH= 1
 MODULE 4 IS PIPE NUMBER 2, MODID 22, NPATH= 3
 MODULE 5 IS VOL. NUMBER 2, MODID 112, NPATH= 1
 MODULE 6 IS TBSG NUMBER 1, MODID 601, NPATH= 1
 SPEED IN RPM IS 1800.00, EFFICIENCY IS 0.40395, POWER FROM GEN -1.074E+09 J/S
 MODULE 7 IS B.C. NUMBER 2, MODID 412, NPATH= 0
 MODULE 8 IS VALV NUMBER 1, MODID 502, NPATH= 1
 RELATIVE VALVE POSITION IS 0.0000100, AND CHOKE FLOW IS 0.688E-04, AS DETERMINED USING OPTION 1
 MODULE 9 IS B.C. NUMBER 3, MODID 414, NPATH= 0
 MODULE 10 IS VALV NUMBER 2, MODID 501, NPATH= 1
 RELATIVE VALVE POSITION IS 0.0000100, AND CHOKE FLOW IS 0.727E-04, AS DETERMINED USING OPTION 1
 MODULE 11 IS B.C. NUMBER 4, MODID 416, NPATH= 0
 MODULE 12 IS B.C. NUMBER 5, MODID 411, NPATH= 0
 MODULE 13 IS PIPE NUMBER 3, MODID 21, NPATH= 1
 MODULE 14 IS B.C. NUMBER 6, MODID 403, NPATH= 0
 MODULE 15 IS H.X. NUMBER 1, MODID 301, NPATH= 1

THE HEAT FLUX AREA CORRECTION FACTOR IS 0.782411

T	NOD	I	NOD	O	NOD	QINR(KJ/S/M)	TINR(K)	T TUBE(K)	TOUTR(K)	QOUTR(KJ/S/M)	MODE,I	MODE,O	T,CORE	T,STRC
1	13	9	9.97574	481.15393	493.29502	526.27031	-9.97601	1	6	481.2	526.3			
MODULE 16	IS	B.C. NUMBER	7,	MODID 406,	NPATH=	0								
MODULE 17	IS	B.C. NUMBER	8,	MODID 401,	NPATH=	0								
MODULE 18	IS	PIPE NUMBER	4,	MODID 1,	NPATH=	1								
MODULE 19	IS	PUMP NUMBER	1,	MODID 201,	NPATH=	2								
PUMP SPEED= 3570.000 PUMP FLOW= 636.305 KG/S PUMP HEAD= 532.746 METERS														
MODULE 20	IS	PIPE NUMBER	5,	MODID 2,	NPATH=	1								
MODULE 21	IS	PIPE NUMBER	6,	MODID 3,	NPATH=	1								
MODULE 22	IS	VOL. NUMBER	3,	MODID 101,	NPATH=	1								
MODULE 23	IS	PIPE NUMBER	7,	MODID 5,	NPATH=	1								
MODULE 24	IS	B.C. NUMBER	9,	MODID 402,	NPATH=	0								
MODULE 25	IS	PIPE NUMBER	8,	MODID 4,	NPATH=	2								
MODULE 26	IS	B.C. NUMBER	10,	MODID 404,	NPATH=	0								

STANDARD TIME STEP NUMBER = 5 ACTUAL TIME STEP NUMBER = 69 TIME = 5.000000E+00 SECONDS

NORMALIZED CORE POWER	CORE POWER (MW)	THERMAL POWER (BTU/HR)	HEAT REMOV. RATE (BTU/HR)	ENERGY BALANCE (BTU)	WATER MASS BALANCE (LBM)	AIR MASS BALANCE (LBM)
1.000000E+00	2.300000E+03	7.891144E+09	0.000000E+00	4.117788E+08	8.921851E+05	3.306896E+03

VOLUME NUMBER	AVG. PRES. (PSIA)	TOT. MASS (LB)	AVG. ENTH. (BTU/LB)	AVG. DEN. (LB/FT3)	AVG. TEMP. (DEG. F)	AVG. QUAL.	BUBB. MASS (LB)	MIX. LEV. (FT)	LIQ. MASS (LB)
1	2.28151E+03	4.02949E+04	6.20386E+02	4.26853E+01	6.04462E+02	0.00000E+00	0.00000E+00	1.16700E+01	4.02949E+04
2	2.25703E+03	8.14902E+03	6.20342E+02	4.26650E+01	6.04365E+02	0.00000E+00	0.00000E+00	3.59000E+00	8.14902E+03
3	2.25801E+03	1.14636E+04	6.20383E+02	4.26632E+01	6.04396E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.14636E+04
4	2.25128E+03	9.88035E+03	6.00274E+02	4.39517E+01	5.90268E+02	0.00000E+00	0.00000E+00	1.05400E+01	9.88035E+03
5	2.24445E+03	1.01369E+04	5.81394E+02	4.50930E+01	5.76437E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.01369E+04
7	2.23596E+03	2.08778E+04	5.57704E+02	4.64365E+01	5.58355E+02	0.00000E+00	0.00000E+00	9.40500E+00	2.08778E+04
8	2.23387E+03	1.05498E+04	5.48584E+02	4.69295E+01	5.51191E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.05498E+04
9	2.23386E+03	1.06217E+04	5.42541E+02	4.72497E+01	5.46387E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.06217E+04
10	2.23560E+03	1.26960E+04	5.42559E+02	4.72498E+01	5.46404E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.26960E+04
11	2.22701E+03	1.23406E+04	5.42541E+02	4.72456E+01	5.46374E+02	0.00000E+00	0.00000E+00	1.20500E+01	1.23406E+04
12	2.27445E+03	1.81446E+04	5.42965E+02	4.72515E+01	5.46799E+02	0.00000E+00	0.00000E+00	5.19000E+00	1.81446E+04
13	2.30897E+03	7.63948E+03	5.42926E+02	4.72740E+01	5.46830E+02	0.00000E+00	0.00000E+00	2.29000E+00	7.63948E+03
14	2.30094E+03	8.69724E+03	5.42957E+02	4.72676E+01	5.46840E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69724E+03
15	2.30079E+03	8.69711E+03	5.42969E+02	4.72669E+01	5.46849E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69711E+03
16	2.30331E+03	8.69728E+03	5.42980E+02	4.72678E+01	5.46863E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69728E+03
17	2.30190E+03	3.44096E+04	5.43000E+02	4.72659E+01	5.46876E+02	0.00000E+00	0.00000E+00	9.79000E+00	3.44096E+04
18	2.29632E+03	7.58852E+03	5.69876E+02	4.57967E+01	5.67866E+02	0.00000E+00	0.00000E+00	4.02000E+00	7.58852E+03
19	2.29204E+03	7.30604E+03	5.98560E+02	4.40920E+01	5.89140E+02	0.00000E+00	0.00000E+00	4.00000E+00	7.30604E+03
20	2.28769E+03	7.04130E+03	6.23350E+02	4.24943E+01	6.06505E+02	0.00000E+00	0.00000E+00	4.10000E+00	7.04130E+03
21	2.29761E+03	2.00872E+03	5.42986E+02	4.72641E+01	5.46858E+02	0.00000E+00	0.00000E+00	1.21000E+01	2.00872E+03
22	2.27943E+03	2.42700E+04	5.42961E+02	4.72547E+01	5.46804E+02	0.00000E+00	0.00000E+00	2.42700E+00	2.42700E+04
23	2.25713E+03	4.07452E+03	6.20342E+02	4.26651E+01	6.04365E+02	0.00000E+00	0.00000E+00	3.59000E+00	4.07452E+03
24	2.25810E+03	5.73395E+03	6.20383E+02	4.26633E+01	6.04396E+02	0.00000E+00	0.00000E+00	5.91000E+00	5.73395E+03
25	2.25137E+03	4.94019E+03	6.00272E+02	4.39519E+01	5.90267E+02	0.00000E+00	0.00000E+00	1.05400E+01	4.94019E+03
26	2.24455E+03	5.06847E+03	5.81392E+02	4.50932E+01	5.76435E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.06847E+03
28	2.23605E+03	1.04390E+04	5.57703E+02	4.64366E+01	5.58354E+02	0.00000E+00	0.00000E+00	9.40500E+00	1.04390E+04
29	2.23396E+03	5.27489E+03	5.48584E+02	4.69296E+01	5.51191E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.27489E+03
30	2.23395E+03	5.31087E+03	5.42541E+02	4.72497E+01	5.46387E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.31087E+03
31	2.23569E+03	6.35038E+03	5.42559E+02	4.72498E+01	5.46404E+02	0.00000E+00	0.00000E+00	5.91000E+00	6.35038E+03
32	2.22710E+03	6.17029E+03	5.42541E+02	4.72457E+01	5.46375E+02	0.00000E+00	0.00000E+00	1.20500E+01	6.17029E+03
33	2.27455E+03	9.07230E+03	5.42965E+02	4.72515E+01	5.46799E+02	0.00000E+00	0.00000E+00	5.19000E+00	9.07230E+03
34	2.30906E+03	3.81974E+03	5.42926E+02	4.72740E+01	5.46830E+02	0.00000E+00	0.00000E+00	2.29000E+00	3.81974E+03
35	2.30104E+03	4.34390E+03	5.42957E+02	4.72677E+01	5.46841E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.34390E+03
36	2.30089E+03	4.34384E+03	5.42969E+02	4.72670E+01	5.46849E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.34384E+03
37	2.30340E+03	4.34392E+03	5.42980E+02	4.72679E+01	5.46863E+02	0.00000E+00	0.00000E+00	8.62000E+00	4.34392E+03
39	LIQ REG VAP REG	2.24999E+03 3.25492E+03	2.85791E+04 1.11784E+03	7.01237E+02 6.25938E+00	3.66402E+01 6.54077E+02	6.54077E+02 9.99996E-01	1.83060E-06 3.25491E+03	5.23170E-02 2.18398E+01	2.85791E+04 1.14866E-02
40		2.25593E+03	1.50174E+03	6.20358E+02	4.26629E+01	6.04373E+02	0.00000E+00	0.00000E+00	9.23000E+00
101		8.30114E+02	1.03230E+05	5.47265E+02	2.18292E+01	5.22040E+02	4.71511E-02	2.41108E+03	8.32517E+01
131		8.21192E+02	2.44838E+02	1.19831E+03	1.80028E+00	5.20788E+02	9.99268E-01	2.44659E+02	3.24200E+01
132		8.03962E+02	8.04026E+02	1.19831E+03	1.76128E+00	5.18342E+02	9.98574E-01	8.02880E+02	1.36300E+01
201		8.30057E+02	2.06431E+05	5.47262E+02	2.18261E+01	5.22032E+02	4.71604E-02	4.82299E+03	3.82516E+01
231		8.21136E+02	4.89641E+02	1.19831E+03	1.80015E+00	5.20781E+02	9.99268E-01	4.89282E+02	3.24200E+01
232		8.03960E+02	1.53231E+03	1.19831E+03	1.76128E+00	5.18342E+02	9.98576E-01	1.53013E+03	1.36300E+01
500		6.14675E+02	1.11384E+05	4.80058E+01	4.51859E+01	8.00000E+01	1.01519E-05	0.00000E+00	1.23900E+01
501		6.14675E+02	5.56918E+04	4.80058E+01	4.51859E+01	8.00000E+01	1.01519E-05	0.00000E+00	1.23900E+01

701	8.36722E+02	6.08166E+03	4.17406E+02	5.22480E+01	4.38290E+02	0.00000E+00	0.00000E+00	2.00000E+00	6.08166E+03
801	8.36665E+02	1.21633E+04	4.17407E+02	5.22479E+01	4.38292E+02	0.00000E+00	0.00000E+00	2.00000E+00	1.21633E+04
900	1.47000E+01	6.44163E+04	1.18996E+03	3.30340E-02	3.00000E+02	1.00000E+00	6.44163E+04	0.00000E+00	0.00000E+00
901	7.90022E+02	1.75408E+00	1.19829E+03	1.72986E+00	5.16334E+02	9.97996E-01	1.75056E+00	1.36300E+01	3.51439E-03
902	7.90022E+02	3.50815E+00	1.19829E+03	1.72986E+00	5.16334E+02	9.97999E-01	3.50113E+00	1.36300E+01	7.01970E-03

JUNCTION NUMBER	CONNECTS VOLUMES	CHOKE MODE	JUN. FLOW (LB/SEC)	JUN. ENTH. (BTU/LB)	JUN. SPVL. (FT3/LB)	P R E S S U R E STAG. PSI	E L E V. PSI	D I F F F R I C. PSI	E R E N T A C C L. PSI	I A L S P U M P PSI
1	1 TO 2		1.87779E+04	6.20343E+02	2.34256E-02	1.43600E+01	1.33474E-01	-1.44934E+01	2.58053E-06	0.00000E+00
2	2 TO 3		1.87779E+04	6.20341E+02	2.34387E-02	9.45086E+00	-9.36234E-01	-8.51463E+00	2.64190E-06	0.00000E+00
3	3 TO 4		1.87779E+04	6.20372E+02	2.34394E-02	5.04210E+00	-2.48400E+00	-2.55810E+00	8.12199E-07	0.00000E+00
4	4 TO 5		1.87779E+04	6.00267E+02	2.27535E-02	6.92141E+00	-3.25879E+00	-3.66262E+00	1.43001E-06	0.00000E+00
5	5 TO 7		1.87779E+04	5.81387E+02	2.21775E-02	8.60430E+00	-3.14619E+00	-5.45811E+00	2.26417E-06	0.00000E+00
7	7 TO 8		1.87779E+04	5.57710E+02	2.15355E-02	2.12469E+00	3.21299E+00	-5.33767E+00	2.82941E-06	0.00000E+00
8	8 TO 9		1.87779E+04	5.48591E+02	2.13087E-02	3.83762E-02	3.44670E+00	-3.48507E+00	2.04115E-06	0.00000E+00
9	9 TO 10		1.87778E+04	5.42548E+02	2.11643E-02	-1.17317E-01	2.69881E+00	-2.58149E+00	1.16315E-06	0.00000E+00
10	10 TO 11		1.87778E+04	5.42533E+02	2.11633E-02	1.39928E+00	2.47718E+00	-3.87645E+00	4.95868E-06	0.00000E+00
11	11 TO 12		1.87778E+04	5.42541E+02	2.11660E-02	-4.22965E+01	-7.74409E-01	-2.01965E+00	7.86270E-06	4.50906E+01
12	12 TO 13		1.87778E+04	5.42925E+02	2.11626E-02	-4.41793E+01	-4.72514E-01	-4.38712E-01	8.31528E-06	4.50906E+01
13	13 TO 14		1.87778E+04	5.42926E+02	2.11534E-02	1.65012E+01	-5.41608E-01	-1.59596E+01	4.86668E-06	0.00000E+00
14	14 TO 15		1.87440E+04	5.42963E+02	2.11559E-02	1.75918E-01	2.83275E+00	-3.00867E+00	1.93121E-06	0.00000E+00
15	15 TO 16		1.87440E+04	5.42974E+02	2.11562E-02	-2.51267E+00	2.82948E+00	-3.16803E-01	1.68661E-06	0.00000E+00
16	16 TO 17		1.87440E+04	5.42985E+02	2.11558E-02	4.26112E+00	1.97275E+00	-6.23387E+00	1.40072E-06	0.00000E+00
17	17 TO 18		2.71302E+04	5.42991E+02	2.11571E-02	4.89172E+00	-2.24596E+00	-2.64576E+00	4.94474E-07	0.00000E+00
18	18 TO 19		2.71302E+04	5.69873E+02	2.18360E-02	4.20035E+00	-1.25164E+00	-2.94872E+00	2.77875E-07	0.00000E+00
19	19 TO 20		2.71302E+04	5.98557E+02	2.26803E-02	4.26773E+00	-1.21734E+00	-3.05039E+00	2.63542E-07	0.00000E+00
20	20 TO 1		2.71302E+04	6.23347E+02	2.35332E-02	6.94529E+00	-2.27544E+00	-4.66985E+00	2.71478E-07	0.00000E+00
21	21 TO 1		9.85799E+02	5.42974E+02	2.11581E-02	1.56611E+01	-3.65949E+00	-1.20016E+01	4.50170E-07	0.00000E+00
22	22 TO 1		5.07002E+01	5.42965E+02	2.11618E-02	-2.68598E+00	2.69268E+00	-6.70004E-03	2.12954E-07	0.00000E+00
23	23 TO 24		9.38894E+03	6.20341E+02	2.34386E-02	9.45085E+00	-9.36236E-01	-8.51461E+00	1.37651E-06	0.00000E+00
24	24 TO 25		9.38894E+03	6.20372E+02	2.34394E-02	5.04210E+00	-2.48400E+00	-2.55810E+00	4.91754E-07	0.00000E+00
25	25 TO 26		9.38894E+03	6.00265E+02	2.27534E-02	6.92141E+00	-3.25880E+00	-3.66261E+00	8.54074E-07	0.00000E+00
26	26 TO 28		9.38894E+03	5.81385E+02	2.21774E-02	8.60429E+00	-3.14620E+00	-5.45809E+00	1.35874E-06	0.00000E+00
28	28 TO 29		9.38893E+03	5.57709E+02	2.15355E-02	2.12467E+00	3.21300E+00	-5.33766E+00	1.78050E-06	0.00000E+00
29	29 TO 30		9.38893E+03	5.48591E+02	2.13087E-02	3.83686E-02	3.44670E+00	-3.48507E+00	1.29115E-06	0.00000E+00
30	30 TO 31		9.38892E+03	5.42548E+02	2.11643E-02	-1.17319E-01	2.69881E+00	-2.58149E+00	7.12818E-07	0.00000E+00
31	31 TO 32		9.38892E+03	5.42534E+02	2.11633E-02	1.39927E+00	2.47718E+00	-3.87645E+00	2.89948E-06	0.00000E+00
32	32 TO 33		9.38891E+03	5.42541E+02	2.11660E-02	-4.22966E+01	-7.74410E-01	-2.01965E+00	5.75162E-06	4.50906E+01
33	33 TO 34		9.38891E+03	5.42926E+02	2.11625E-02	-4.41794E+01	-4.72515E-01	-4.38712E-01	6.19050E-06	4.50906E+01
34	34 TO 35		9.38890E+03	5.42926E+02	2.11534E-02	1.65012E+01	-5.41609E-01	-1.59596E+01	2.56201E-06	0.00000E+00
35	35 TO 36		9.37200E+03	5.42963E+02	2.11559E-02	1.75914E-01	2.83276E+00	-3.00867E+00	1.03918E-06	0.00000E+00
36	36 TO 37		9.37200E+03	5.42974E+02	2.11562E-02	-2.51432E+00	2.83112E+00	-3.16803E-01	8.50266E-07	0.00000E+00
37	37 TO 17		9.37200E+03	5.42985E+02	2.11558E-02	4.24916E+00	1.97111E+00	-6.22028E+00	7.31700E-07	0.00000E+00
39	39 TO 40		1.41895E-01	7.01237E+02	2.72868E-02	-5.94318E+00	5.94314E+00	-4.82896E-07	-4.37112E-05	0.00000E+00
40	40 TO 23		1.59797E-01	6.20364E+02	2.34390E-02	-1.19401E+00	1.19396E+00	-2.38392E-07	-4.83708E-05	0.00000E+00
42	17 TO 21		9.85799E+02	5.42994E+02	2.11572E-02	4.77714E+00	-3.59246E+00	-1.18467E+00	5.02536E-07	0.00000E+00
43	1 TO 23		9.38878E+03	6.20343E+02	2.34256E-02	1.43650E+01	1.33473E-01	-1.44985E+01	3.58756E-06	0.00000E+00
44	35 TO 22		1.69000E+01	5.42900E+02	2.11551E-02	2.83636E+01	-2.67487E+00	-2.56887E+01	1.25168E-06	0.00000E+00
45	14 TO 22		3.38000E+01	5.42899E+02	2.11552E-02	2.82684E+01	-2.67487E+00	-2.55935E+01	1.66072E-06	0.00000E+00
75	23 TO 900		0.00000E+00	6.20389E+02	2.34399E-02	0.00000E+00	1.54677E-01	0.00000E+00	0.00000E+00	0.00000E+00
100	701 TO 101		9.34715E+02	4.17409E+02	1.91396E-02	8.23347E+00	-5.98630E+00	-2.24701E+00	1.59015E-04	0.00000E+00
101	101 TO 131		9.35268E+02	1.19855E+03	5.50700E-01	3.65351E+00	-1.64744E+00	-2.00611E+00	-3.83630E-05	0.00000E+00
131	131 TO 132		9.35271E+02	1.19611E+03	5.53849E-01	1.69992E+01	2.86012E-01	-1.72853E+01	-9.89370E-05	0.00000E+00
200	801 TO 201		1.87089E+03	4.17410E+02	1.91396E-02	8.23652E+00	-5.98571E+00	-2.25060E+00	2.10605E-04	0.00000E+00
201	201 TO 231		1.87043E+03	1.19855E+03	5.50740E-01	3.65285E+00	-1.64686E+00	-2.00603E+00	-3.92862E-05	0.00000E+00
231	231 TO 232		1.87043E+03	1.19612E+03	5.53889E-01	1.69455E+01	2.85997E-01	-1.72317E+01	-1.65109E-04	0.00000E+00
500	500 TO 13		0.00000E+00	5.42972E+02	2.11544E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00
501	501 TO 34		0.00000E+00	5.42972E+02	2.11543E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00
901	132 TO 901		9.35278E+02	1.19829E+03	5.68523E-01	1.34567E+01	1.48721E-03	-1.34578E+01	3.41493E-04	0.00000E+00
902	232 TO 902		1.87044E+03	1.19829E+03	5.68486E-01	1.34551E+01	1.48704E-03	-1.34563E+01	3.31183E-04	0.00000E+00

800	0 TO 801	1.87112E+03	4.17253E+02	1.91373E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
700	0 TO 701	9.34828E+02	4.17251E+02	1.91373E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
601	0 TO 36	0.00000E+00	5.42982E+02	2.11567E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
600	0 TO 15	0.00000E+00	5.42982E+02	2.11568E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
290	0 TO 201	0.00000E+00	5.17231E+02	2.17699E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
254	0 TO 232	0.00000E+00	1.19888E+03	5.68162E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
253	0 TO 232	0.00000E+00	1.19888E+03	5.68162E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
252	0 TO 232	0.00000E+00	1.19888E+03	5.68162E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
251	0 TO 232	0.00000E+00	1.19888E+03	5.68162E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
235	0 TO 232	0.00000E+00	1.19888E+03	5.68162E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
234	0 TO 232	0.00000E+00	1.19888E+03	5.68162E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
232	0 TO 232	0.00000E+00	1.19840E+03	5.90342E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
190	0 TO 101	0.00000E+00	5.17240E+02	2.17697E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
154	0 TO 132	0.00000E+00	1.19888E+03	5.68159E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
153	0 TO 132	0.00000E+00	1.19888E+03	5.68159E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
152	0 TO 132	0.00000E+00	1.19888E+03	5.68159E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
151	0 TO 132	0.00000E+00	1.19888E+03	5.68159E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
135	0 TO 132	0.00000E+00	1.19888E+03	5.68159E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
134	0 TO 132	0.00000E+00	1.19888E+03	5.68159E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
132	0 TO 132	0.00000E+00	1.19840E+03	5.90342E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
95	0 TO 34	0.00000E+00	5.42971E+02	2.11544E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
94	0 TO 13	0.00000E+00	5.42971E+02	2.11544E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
92	0 TO 13	0.00000E+00	5.42972E+02	2.11544E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

PUMP NUMBER	VOLUME NUMBER	PUMP SPEED (RPM)	NORM. PUMP TORQUE	NORM. FRIC. TORQUE	NORM. MOT. TORQUE	POWER TO H2O (BTU/HR)
1	33	1.19000E+03	9.97562E-01	1.00000E+00	0.00000E+00	1.37479E+07
2	12	1.19000E+03	9.97561E-01	1.00000E+00	0.00000E+00	2.74958E+07

HEAT COND. NUMBER	VOL. NUM.	H.T. MODE	SURF. FLUX (BTU/HR-FT ²)	CRIT. FLUX (BTU/HR-FT ²)	H.T. COEF. (BTU/H-F ² -F)	SURF. TEMP. (DEG. F)	MASS FLUX (LBM/HR-FT ²)	STORD ENRGY (BTU)	POWR TO H2O (BTU/HR)
1	RIGHT	18	1.84648E+05	1.19236E+06	5.72837E+03	6.00100E+02	2.35801E+06	7.23050E+06	2.62611E+09
2	RIGHT	19	1.97017E+05	1.15767E+06	5.83989E+03	6.22876E+02	2.35801E+06	7.68589E+06	2.80202E+09
3	RIGHT	20	1.70281E+05	1.12976E+06	5.94333E+03	6.35156E+02	2.35801E+06	7.05712E+06	2.42177E+09
16	RIGHT	2	5.37113E-02	1.15168E+06	6.52952E+03	6.04365E+02	7.36388E+06	2.59328E+06	1.58985E+01
17	RIGHT	3	1.66904E-02	1.15106E+06	1.01191E+03	6.04396E+02	8.98463E+05	8.22283E+06	4.56750E+01
18	RIGHT	10	1.49886E+00	1.26820E+06	9.60271E+02	5.46405E+02	8.98461E+05	7.36861E+06	4.10179E+03
19	RIGHT	11	7.56000E+00	1.27346E+06	5.50280E+03	5.46376E+02	6.45040E+06	3.60621E+06	3.31128E+03
20	RIGHT	12	3.50515E+00	1.24335E+06	3.18977E+03	5.46800E+02	3.52084E+06	1.75118E+07	1.23872E+03
21	RIGHT	13	3.19340E+00	1.22101E+06	6.82997E+03	5.46830E+02	8.20389E+06	1.91579E+06	8.17510E+02
22	RIGHT	14	3.56998E+00	1.22624E+06	5.19015E+03	5.46841E+02	4.37824E+06	7.16016E+06	8.65364E+02
23	RIGHT	15	2.75176E+00	1.22633E+06	5.18272E+03	5.46850E+02	4.37036E+06	7.16029E+06	6.67027E+02
24	RIGHT	16	2.05118E+00	1.22466E+06	5.18269E+03	5.46863E+02	4.37036E+06	7.16048E+06	4.97206E+02
25	RIGHT	17	4.01925E-01	1.22556E+06	2.06937E+03	5.46876E+02	1.36118E+06	4.36586E+06	1.11615E+02
26	RIGHT	23	5.42126E-02	1.15163E+06	6.52952E+03	6.04365E+02	7.36388E+06	1.29664E+06	8.02347E+00
27	RIGHT	24	1.66897E-02	1.15101E+06	1.01191E+03	6.04396E+02	8.98463E+05	4.11142E+06	2.28366E+01
28	RIGHT	31	1.28579E+00	1.26814E+06	9.60271E+02	5.46406E+02	8.98461E+05	3.68431E+06	1.75934E+03
29	RIGHT	32	6.45523E+00	1.27340E+06	5.50280E+03	5.46376E+02	6.45040E+06	1.80310E+06	1.41370E+03
30	RIGHT	33	3.00676E+00	1.24329E+06	3.18977E+03	5.46800E+02	3.52084E+06	8.75590E+06	5.31295E+02
31	RIGHT	34	2.71892E+00	1.22095E+06	6.82997E+03	5.46830E+02	8.20390E+06	9.57897E+05	3.48022E+02
32	RIGHT	35	3.08858E+00	1.22618E+06	5.19015E+03	5.46841E+02	4.37824E+06	3.58008E+06	3.74335E+02
33	RIGHT	36	2.39992E+00	1.22627E+06	5.18272E+03	5.46850E+02	4.37036E+06	3.58014E+06	2.90871E+02
34	RIGHT	37	1.80635E+00	1.22460E+06	5.18269E+03	5.46863E+02	4.37036E+06	3.58024E+06	2.18930E+02
35	RIGHT	22	5.81706E-04	1.24018E+06	1.16855E+01	5.46804E+02	3.03542E+03	9.74428E+06	1.41471E-01
4	LEFT	4	-1.14884E+05	1.18021E+06	6.76684E+03	5.73290E+02	3.16778E+06		-1.35821E+09
	RIGHT	201	1.01758E+05	1.52746E+06	1.07933E+04	5.31460E+02	3.81162E+04	1.73757E+06	1.35822E+09
5	LEFT	5	-8.88848E+04	1.20898E+06	6.68132E+03	5.63133E+02	3.16778E+06		-1.27540E+09
	RIGHT	201	7.87296E+04	1.52746E+06	9.09634E+03	5.30687E+02	3.81162E+04	2.08797E+06	1.27541E+09
6	LEFT	7	-5.57833E+04	1.24650E+06	6.57800E+03	5.49874E+02	3.16778E+06		-8.00326E+08
	RIGHT	201	4.94103E+04	1.52746E+06	6.66786E+03	5.29442E+02	3.81162E+04	2.04276E+06	8.00340E+08

9	LEFT	9	1	-3.46346E+04	1.26929E+06	6.51298E+03	5.41069E+02	3.16777E+06				-4.09467E+08
	RIGHT	201	11	3.06781E+04	1.52746E+06	4.85282E+03	5.28354E+02	3.81162E+04	1.67880E+06			4.09480E+08
8	LEFT	8	1	-4.30296E+04	1.26064E+06	6.53886E+03	5.44610E+02	3.16777E+06				-6.17428E+08
	RIGHT	201	11	3.81139E+04	1.52746E+06	5.60829E+03	5.28828E+02	3.81162E+04	2.04682E+06			6.17442E+08
7	LEFT	7	1	-5.57833E+04	1.24650E+06	6.57800E+03	5.49874E+02	3.16778E+06				-8.00326E+08
	RIGHT	201	11	4.94103E+04	1.52746E+06	6.66786E+03	5.29442E+02	3.81162E+04	2.04276E+06			8.00340E+08
10	LEFT	25	1	-1.14868E+05	1.18015E+06	6.76683E+03	5.73292E+02	3.16778E+06				-6.79163E+08
	RIGHT	101	11	1.01744E+05	1.52747E+06	1.07925E+04	5.31467E+02	3.81024E+04	8.68794E+05			6.79167E+08
11	LEFT	26	1	-8.88680E+04	1.20893E+06	6.68131E+03	5.63134E+02	3.16778E+06				-6.37720E+08
	RIGHT	101	11	7.87146E+04	1.52747E+06	9.09536E+03	5.30694E+02	3.81024E+04	1.04399E+06			6.37726E+08
12	LEFT	28	1	-5.57682E+04	1.24645E+06	6.57800E+03	5.49876E+02	3.16778E+06				-4.00143E+08
	RIGHT	101	11	4.93969E+04	1.52747E+06	6.66678E+03	5.29449E+02	3.81024E+04	1.02139E+06			4.00150E+08
15	LEFT	30	1	-3.46222E+04	1.26923E+06	6.51298E+03	5.41071E+02	3.16777E+06				-2.04705E+08
	RIGHT	101	11	3.06671E+04	1.52747E+06	4.85174E+03	5.28361E+02	3.81024E+04	8.39407E+05			2.04711E+08
14	LEFT	29	1	-4.30159E+04	1.26058E+06	6.53886E+03	5.44612E+02	3.16777E+06				-3.08684E+08
	RIGHT	101	11	3.81017E+04	1.52747E+06	5.60720E+03	5.28835E+02	3.81024E+04	1.02342E+06			3.08691E+08
13	LEFT	28	1	-5.57682E+04	1.24645E+06	6.57800E+03	5.49876E+02	3.16778E+06				-4.00143E+08
	RIGHT	101	11	4.93969E+04	1.52747E+06	6.66678E+03	5.29449E+02	3.81024E+04	1.02139E+06			4.00150E+08

CORE SECT. NUMBER	HEAT COND. NUMBER	DEPTH REAC. EXT. ZR-H2O (FT)	DEPTH REAC. INT. ZR-H2O (FT)	HEAT GEN. ZR-H2O (BTU/HR)	COND. HEAT- ING RATE (BTU/HR)	DIR. MODER- ATOR HT RT (BTU/HR)	AVG. METAL TEMPERATURE (DEG. F)	CENTERLINE TEMPERATURE (DEG. F)
1	1	0.00000E+00	0.00000E+00	0.00000E+00	2.62611E+09	0.00000E+00	1.52207E+03	1.99764E+03
2	2	0.00000E+00	0.00000E+00	0.00000E+00	2.80202E+09	0.00000E+00	1.61303E+03	2.14152E+03
3	3	0.00000E+00	0.00000E+00	0.00000E+00	2.42177E+09	0.00000E+00	1.47730E+03	1.90598E+03

CONTEXT SAVE AT 5.00000 SECONDS STEP NO. 69

WRITTEN TO UNIT NUMBER 34

DATA RECORD NUMBER 6 WAS WRITTEN ON TAPE VSN = , DENSITY = PE, CREATED ON 90159
AND WAS LABELED RETRAN1

TIMING EDIT ACCUMULATED TIME = 7.813 SECONDS

SUBROUTINE	CPU TIME (SEC)	PERCENT	NUMBER OF CALLS
* STSTAT	2.604	33.33	1
* TRAN	5.208	66.67	1
DIRSOL	2.604	33.33	414
* CONTRL	2.604	33.33	3630
* ENERGY	5.208	66.67	294
* INDICATES OUTER LOOP TIME			

TIME STEP CONTROL SUMMARY FOR 13 ACTUAL TIME STEPS. THE AVERAGE TIME STEP SIZE FOR THE INTERVAL WAS 7.692308E-02 SECONDS.

NUMBER OF TIMES EACH TEST CONTROLLED TIME STEP SIZE

UPPER LIMIT	LOWER LIMIT	PRESSURE CHANGE	MASS CHANGE	ENERGY CHANGE	COURANT LIMIT	SAT LINE CROSSING	AIR MASS CHANGE	ZERO FLOW CROSSING	TRIP ACTUATION
0	0	0	0	0	12	0	0	0	1

VOLUMES CONTROLLING COURANT LIMIT
 (VOLUME INDEX ; TIMES CONTROLLING)

20; 12

TRIP ID(S) CONTROLLING TIME STEP
 (TRIP ID ; TIMES CONTROLLING)

15; 1

MINET, TIME= 10.00000 TIME STEP=0.06724 STEP NO. 136
 MINIMUM TIME CONSTANT= 5.238E-01 SEC, LIMIT KEY= 101

SYSTEM BOUNDARY CONDITIONS:

ID	NETWORK	FLOW(KG/S)	ENTHALPY(MJ/KG)	PRESSURE(MPA)	TEMP(K)	FLUID
413	1	843.449	2.787258	5.446250	542.079	H2O
412	1	1272.268	1.899514	3.892000	521.547	H2O
414	1	0.000	2.790930	4.892000	535.337	H2O
416	1	0.000	2.779053	5.000000	536.694	H2O
411	1	429.061	2.787238	5.446308	542.080	H2O
403	2	181.930	2.740000	4.230402	526.486	H2O
406	2	181.939	1.598581	4.200000	526.054	H2O
401	3	1272.610	0.808470	3.133078	463.120	H2O
402	3	419.740	0.971300	5.774321	498.802	H2O
404	3	852.981	0.971295	5.764905	498.801	H2O

SYSTEM VOLUMES

ID	PRESSURE(MPA)	ENTHALPY(MJ/KG)	TEMP(K)	LEVEL(RELATIVE)	HEAT INPUT(MJ/S)	NETWORK	REGIONS
111	5.444171	2.787254	542.055	0.000000	0.000000	1	1
112	5.166758	2.787241	538.748	0.000000	0.000000	1	1
101	5.988596	0.971359	498.808	0.000000	0.000000	3	1

SYSTEM SEGMENTS

SEG	NETWK	WIN(KG/S)	WOUT(KG/S)	WBAR(KG/S)	ALPHA IS IN MPA*SEC*SEC/KG/KG			POUT(MPA)	ALPHA, SEG	BETA(MPA)	CONNECTS TO:	
					EIN(MJ/KG)	EOUT(MJ/KG)	PIN(MPA)				IN	OUT
1	1	843.449	843.449	843.449	2.787258	2.787258	5.446250	5.444307	0.235E-08	-0.000272	413	111
2	1	1272.413	1272.341	1272.377	2.787252	2.787249	5.444171	5.166758	0.171E-06	0.000006	111	112
3	1	1272.268	1272.268	1272.268	2.787238	1.899514	5.166758	3.892000	0.787E-06	0.000000	112	412
4	1	0.000	0.000	0.000	2.787238	2.790930	5.166887	4.892000	0.238E+09	0.000000	112	414
5	1	0.000	0.000	0.000	2.787252	2.779053	5.444035	5.000000	0.228E+09	-0.000392	111	416
6	1	429.061	429.061	429.061	2.787238	2.787238	5.446308	5.444307	0.939E-08	-0.000272	411	111
7	2	181.930	181.939	181.935	2.740000	1.598581	4.230402	4.200000	0.943E-06	0.000817	403	406
8	3	1272.610	1272.613	1272.610	0.808470	0.971620	3.133078	5.988596	0.214E-05	6.317966	401	101
9	3	419.739	419.740	419.740	0.971358	0.971300	5.988596	5.774321	0.137E-05	0.026170	101	402
10	3	852.964	852.981	852.974	0.971358	0.971295	5.988596	5.764905	0.343E-06	0.026169	101	404

IN-SEGMENT DISTRIBUTIONS														
SEG	MODID	NODE	EIN(MJ/KG)	EBAR(MJ/KG)	EOUT(MJ/KG)	WIN(KG/S)	WOUT(KG/S)	TIN(K)	TBAR(K)	TOUT(K)	DENS(KG/M3)	QA(MJ/S)	JIN	JOUT
1	23	1	2.787258	2.787258	2.787258	843.449	843.449	542.068	542.068	542.068	27.710	0.000	1	2
2	22	2	2.787252	2.787252	2.787252	1272.413	1272.389	540.418	540.418	540.418	26.978	0.000	3	4
2	22	3	2.787252	2.787251	2.787251	1272.389	1272.365	540.418	540.418	540.418	26.978	0.000	4	5
2	22	4	2.787251	2.787250	2.787249	1272.365	1272.341	540.418	540.418	540.418	26.978	0.000	5	6
3	601	5	2.787238	2.343376	1.899514	1272.268	1272.268	530.606	530.606	530.606	30.971	-1129.424	7	8
4	502	6	2.787238	2.789042	2.790930	0.000	0.000	537.061	537.061	537.061	25.510	0.000	9	10
5	501	7	2.787252	2.783133	2.779053	0.000	0.000	539.417	539.417	539.417	26.607	0.000	11	12
6	21	8	2.787238	2.787238	2.787238	429.061	429.061	542.068	542.068	542.068	27.710	0.000	13	14
7	301	9	2.740000	2.169290	1.598581	181.930	181.939	526.270	526.270	526.270	33.169	-207.653	15	16
8	1	10	0.808470	0.808470	0.808470	1272.610	1272.610	462.949	462.949	462.949	876.722	0.000	17	18
8	201	11	0.808470	0.808470	0.808470	1272.610	1272.610	462.949	462.949	462.949	876.722	0.000	18	19
8	2	12	0.808470	0.808470	0.808471	1272.610	1272.609	462.949	462.949	462.949	876.722	0.000	19	20
8	301	13	0.808471	0.890052	0.971634	1272.609	1272.609	462.949	481.158	498.910	856.754	207.652	20	21
8	3	14	0.971634	0.971632	0.971629	1272.609	1272.610	498.910	498.910	498.909	835.560	0.000	21	22
8	3	15	0.971629	0.971625	0.971620	1272.610	1272.613	498.909	498.908	498.907	835.562	0.000	22	23
9	5	16	0.971358	0.971345	0.971331	419.739	419.741	498.812	498.809	498.806	836.919	0.000	24	25
9	5	17	0.971331	0.971321	0.971311	419.741	419.741	498.806	498.803	498.801	836.926	0.000	25	26
9	5	18	0.971311	0.971306	0.971300	419.741	419.740	498.801	498.800	498.799	836.930	0.000	26	27
10	4	19	0.971358	0.971343	0.971327	852.964	852.972	498.812	498.808	498.805	836.915	0.000	28	29
10	4	20	0.971327	0.971317	0.971306	852.972	852.978	498.805	498.803	498.800	836.922	0.000	29	30
10	4	21	0.971306	0.971301	0.971295	852.978	852.981	498.800	498.799	498.798	836.926	0.000	30	31

SYSTEM MODULES

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MODULE 1 IS B.C. NUMBER 1, MODID 413,NPATH= 0
MODULE 2 IS PIPE NUMBER 1, MODID 23,NPATH= 2
MODULE 3 IS VOL. NUMBER 1, MODID 111,NPATH= 1
MODULE 4 IS PIPE NUMBER 2, MODID 22,NPATH= 3
MODULE 5 IS VOL. NUMBER 2, MODID 112,NPATH= 1
MODULE 6 IS TBSG NUMBER 1, MODID 601,NPATH= 1
SPEED IN RPM IS 1800.00, EFFICIENCY IS 0.40402, POWER FROM GEN -1.073E+09 J/S
MODULE 7 IS B.C. NUMBER 2, MODID 412,NPATH= 0
MODULE 8 IS VALV NUMBER 1, MODID 502,NPATH= 1
RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.688E-04,AS DETERMINED USING OPTION 1
MODULE 9 IS B.C. NUMBER 3, MODID 414,NPATH= 0
MODULE 10 IS VALV NUMBER 2, MODID 501,NPATH= 1
RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.727E-04,AS DETERMINED USING OPTION 1
MODULE 11 IS B.C. NUMBER 4, MODID 416,NPATH= 0
MODULE 12 IS B.C. NUMBER 5, MODID 411,NPATH= 0
MODULE 13 IS PIPE NUMBER 3, MODID 21,NPATH= 1
MODULE 14 IS B.C. NUMBER 6, MODID 403,NPATH= 0
MODULE 15 IS H.X. NUMBER 1, MODID 301,NPATH= 1
THE HEAT FLUX AREA CORRECTION FACTOR IS 0.782411
T NOD I NOD O NOD QINR(KJ/S/M ) TINR(K) T TUBE(K) TOUTR(K) QOUTR(KJ/S/M ) MODE,I MODE,O T,CORE T,STRC
-----
1 13 9 9.97484 481.15838 493.29825 526.27033 -9.97489 1 6 481.2 526.3
MODULE 16 IS B.C. NUMBER 7, MODID 406,NPATH= 0
MODULE 17 IS B.C. NUMBER 8, MODID 401,NPATH= 0
MODULE 18 IS PIPE NUMBER 4, MODID 1,NPATH= 1
MODULE 19 IS PUMP NUMBER 1, MODID 201,NPATH= 2
PUMP SPEED= 3570.000 PUMP FLOW= 636.305 KG/S PUMP HEAD= 532.746 METERS
MODULE 20 IS PIPE NUMBER 5, MODID 2,NPATH= 1
MODULE 21 IS PIPE NUMBER 6, MODID 3,NPATH= 1
MODULE 22 IS VOL. NUMBER 3, MODID 101,NPATH= 1
MODULE 23 IS PIPE NUMBER 7, MODID 5,NPATH= 1
MODULE 24 IS B.C. NUMBER 9, MODID 402,NPATH= 0
MODULE 25 IS PIPE NUMBER 8, MODID 4,NPATH= 2
MODULE 26 IS B.C. NUMBER 10, MODID 404,NPATH= 0
    
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STANDARD TIME STEP NUMBER = 10 ACTUAL TIME STEP NUMBER = 136 TIME = 1.000000E+01 SECONDS

	NORMALIZED CORE POWER	CORE POWER (MW)	THERMAL POWER (BTU/HR)	HEAT REMOV. RATE (BTU/HR)	ENERGY BALANCE (BTU)	WATER MASS BALANCE (LBM)	AIR MASS BALANCE (LBM)			
	1.000000E+00	2.300000E+03	7.891098E+09	0.000000E+00	4.090352E+08	8.877801E+05	3.306896E+03			
VOLUME NUMBER	AVG. PRES. (PSIA)	TOT. MASS (LB)	AVG. ENTH. (BTU/LB)	AVG. DEN. (LB/FT3)	AVG. TEMP. (DEG. F)	AVG. QUAL.	BUBB. MASS (LB)	MIX. LEV. (FT)	LIQ. MASS (LB)	
1	2.18041E+03	4.02292E+04	6.19991E+02	4.26156E+01	6.03912E+02	0.00000E+00	0.00000E+00	1.16700E+01	4.02292E+04	
2	2.15601E+03	8.13582E+03	6.19938E+02	4.25959E+01	6.03809E+02	0.00000E+00	0.00000E+00	3.59000E+00	8.13582E+03	
3	2.15698E+03	1.14451E+04	6.19978E+02	4.25942E+01	6.03839E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.14451E+04	
4	2.15026E+03	9.86585E+03	5.99955E+02	4.38872E+01	5.89780E+02	0.00000E+00	0.00000E+00	1.05400E+01	9.86585E+03	
5	2.14345E+03	1.01232E+04	5.81156E+02	4.50320E+01	5.76022E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.01232E+04	
7	2.13497E+03	2.08522E+04	5.57553E+02	4.63795E+01	5.58032E+02	0.00000E+00	0.00000E+00	9.40500E+00	2.08522E+04	
8	2.13289E+03	1.05373E+04	5.48463E+02	4.68739E+01	5.50904E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.05373E+04	
9	2.13288E+03	1.06095E+04	5.42432E+02	4.71953E+01	5.46118E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.06095E+04	
10	2.13462E+03	1.26820E+04	5.42411E+02	4.71974E+01	5.46105E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.26820E+04	
11	2.12603E+03	1.23274E+04	5.42359E+02	4.71951E+01	5.46047E+02	0.00000E+00	0.00000E+00	1.20500E+01	1.23274E+04	
12	2.17342E+03	1.81262E+04	5.42732E+02	4.72037E+01	5.46431E+02	0.00000E+00	0.00000E+00	5.19000E+00	1.81262E+04	
13	2.20788E+03	7.63194E+03	5.42673E+02	4.72273E+01	5.46445E+02	0.00000E+00	0.00000E+00	2.29000E+00	7.63194E+03	
14	2.19986E+03	8.68883E+03	5.42686E+02	4.72219E+01	5.46441E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.68883E+03	
15	2.19970E+03	8.68886E+03	5.42680E+02	4.72221E+01	5.46436E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.68886E+03	
16	2.20221E+03	8.68918E+03	5.42676E+02	4.72238E+01	5.46438E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.68918E+03	
17	2.20081E+03	3.43789E+04	5.42661E+02	4.72238E+01	5.46423E+02	0.00000E+00	0.00000E+00	9.79000E+00	3.43789E+04	
18	2.19522E+03	7.58012E+03	5.69541E+02	4.57460E+01	5.67389E+02	0.00000E+00	0.00000E+00	4.02000E+00	7.58012E+03	
19	2.19094E+03	7.29568E+03	5.98227E+02	4.40295E+01	5.88642E+02	0.00000E+00	0.00000E+00	4.00000E+00	7.29568E+03	
20	2.18659E+03	7.02883E+03	6.23016E+02	4.24190E+01	6.05996E+02	0.00000E+00	0.00000E+00	4.10000E+00	7.02883E+03	
21	2.19652E+03	2.00701E+03	5.42613E+02	4.72237E+01	5.46377E+02	0.00000E+00	0.00000E+00	1.21000E+01	2.00701E+03	
22	2.17833E+03	2.42498E+04	5.42565E+02	4.72154E+01	5.46306E+02	0.00000E+00	0.00000E+00	7.67000E+00	2.42498E+04	
23	2.15192E+03	4.03522E+03	6.24962E+02	4.22536E+01	6.07220E+02	0.00000E+00	0.00000E+00	3.59000E+00	4.03522E+03	
24	2.15696E+03	5.68131E+03	6.24769E+02	4.22717E+01	6.07103E+02	0.00000E+00	0.00000E+00	5.91000E+00	5.68131E+03	
25	2.15026E+03	4.90638E+03	6.03685E+02	4.36511E+01	5.92443E+02	0.00000E+00	0.00000E+00	1.05400E+01	4.90638E+03	
26	2.14347E+03	5.04319E+03	5.83898E+02	4.48683E+01	5.78059E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.04319E+03	
28	2.13501E+03	1.04073E+04	5.59063E+02	4.62959E+01	5.59205E+02	0.00000E+00	0.00000E+00	9.40500E+00	1.04073E+04	
29	2.13293E+03	5.26227E+03	5.49514E+02	4.68174E+01	5.51733E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.26227E+03	
30	2.13292E+03	5.30039E+03	5.43166E+02	4.71565E+01	5.46703E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.30039E+03	
31	2.13466E+03	6.33968E+03	5.42926E+02	4.71703E+01	5.46515E+02	0.00000E+00	0.00000E+00	5.91000E+00	6.33968E+03	
32	2.12609E+03	6.16137E+03	5.42955E+02	4.71774E+01	5.46315E+02	0.00000E+00	0.00000E+00	1.20500E+01	6.16137E+03	
33	2.17348E+03	9.06142E+03	5.42900E+02	4.71949E+01	5.46564E+02	0.00000E+00	0.00000E+00	5.19000E+00	9.06142E+03	
34	2.20797E+03	3.81550E+03	5.42784E+02	4.72215E+01	5.46534E+02	0.00000E+00	0.00000E+00	2.29000E+00	3.81550E+03	
35	2.19995E+03	4.33937E+03	5.42752E+02	4.72184E+01	5.46494E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.33937E+03	
36	2.19980E+03	4.33953E+03	5.42717E+02	4.72202E+01	5.46466E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.33953E+03	
37	2.20231E+03	4.33978E+03	5.42696E+02	4.72228E+01	5.46453E+02	0.00000E+00	0.00000E+00	8.62000E+00	4.33978E+03	
39	LIQ REG VAP REG	2.15939E+03	2.47000E+04	6.96646E+02	3.47825E+01	6.47970E+02	1.38342E-02	3.41705E+02	1.98836E+01	2.43583E+04
			3.49717E+03	1.11984E+03	5.92869E+00	6.47970E+02	9.86567E-01	3.45020E+03	1.98836E+01	4.69773E+01
40		2.15200E+03	1.31782E+03	6.89641E+02	3.74380E+01	6.47394E+02	0.00000E+00	0.00000E+00	9.23000E+00	1.31782E+03
101		8.30995E+02	1.03203E+05	5.47457E+02	2.18234E+01	5.22163E+02	4.72238E-02	2.42659E+03	3.83267E+01	9.83294E+04
131		8.21888E+02	2.45059E+02	1.19829E+03	1.80191E+00	5.20887E+02	9.99269E-01	2.44880E+02	3.24200E+01	1.79251E-01
132		8.04213E+02	8.04279E+02	1.19832E+03	1.76184E+00	5.18378E+02	9.98592E-01	8.03147E+02	1.36300E+01	1.13208E+00
201		8.29466E+02	2.06465E+05	5.47134E+02	2.18296E+01	5.21949E+02	4.71128E-02	4.80504E+03	3.82097E+01	1.96737E+05
231		8.20634E+02	4.89318E+02	1.19833E+03	1.79896E+00	5.20710E+02	9.99274E-01	4.88963E+02	3.24200E+01	3.55113E-01
232		8.03675E+02	1.53172E+03	1.19833E+03	1.76059E+00	5.18301E+02	9.98588E-01	1.52955E+03	1.36300E+01	2.16253E+00
500		6.14685E+02	1.11384E+05	4.80058E+01	4.51859E+01	8.00000E+01	1.01517E-05	0.00000E+00	1.23900E+01	1.11383E+05
501		6.14685E+02	5.56918E+04	4.80058E+01	4.51859E+01	8.00000E+01	1.01517E-05	0.00000E+00	1.23900E+01	5.56913E+04

701	8.37529E+02	6.08208E+03	4.17323E+02	5.22515E+01	4.38216E+02	0.00000E+00	0.00000E+00	2.00000E+00	6.08208E+03
801	8.36111E+02	1.21640E+04	4.17320E+02	5.22510E+01	4.38214E+02	0.00000E+00	0.00000E+00	2.00000E+00	1.21640E+04
900	1.47000E+01	6.44163E+04	1.18996E+03	3.30340E-02	3.00000E+02	1.00000E+00	6.44163E+04	0.00000E+00	0.00000E+00
901	7.89920E+02	1.75383E+00	1.19830E+03	1.72961E+00	5.16320E+02	9.98003E-01	1.75032E+00	1.36300E+01	3.50197E-03
902	7.89912E+02	3.50757E+00	1.19831E+03	1.72957E+00	5.16318E+02	9.98015E-01	3.50061E+00	1.36300E+01	6.96172E-03

JUNCTION NUMBER	CONNECTS	CHOKE MODE	JUN. FLOW (LB/SEC)	JUN. ENTH. (BTU/LB)	JUN. SPVL. (FT3/LB)	P R E S S U R E				D I F F E R E N T I A L S
						STAG. PSI	ELEV. PSI	FRIC. PSI	ACCL. PSI	
1	1 TO 2		1.87335E+04	6.19951E+02	2.34633E-02	1.43135E+01	1.33257E-01	-1.44489E+01	-2.20573E-03	0.00000E+00
2	2 TO 3		1.87362E+04	6.19940E+02	2.34762E-02	9.42353E+00	-9.34738E-01	-8.49083E+00	-2.03488E-03	0.00000E+00
3	3 TO 4		1.87400E+04	6.19970E+02	2.34769E-02	5.03168E+00	-2.48027E+00	-2.55183E+00	-4.21279E-04	0.00000E+00
4	4 TO 5		1.87428E+04	5.99951E+02	2.27865E-02	6.90866E+00	-3.25426E+00	-3.65415E+00	2.45824E-04	0.00000E+00
5	5 TO 7		1.87455E+04	5.81151E+02	2.22071E-02	8.58781E+00	-3.14217E+00	-5.44643E+00	-7.93260E-04	0.00000E+00
7	7 TO 8		1.87506E+04	5.57560E+02	2.15616E-02	2.11832E+00	3.20917E+00	-5.32836E+00	-8.64154E-04	0.00000E+00
8	8 TO 9		1.87531E+04	5.48470E+02	2.13337E-02	3.64057E-02	3.44273E+00	-3.47971E+00	-5.81378E-04	0.00000E+00
9	9 TO 10		1.87555E+04	5.42439E+02	2.11884E-02	-1.17940E-01	2.69579E+00	-2.57817E+00	-3.19427E-04	0.00000E+00
10	10 TO 11		1.87584E+04	5.42386E+02	2.11865E-02	1.39689E+00	2.47454E+00	-3.87275E+00	-1.32060E-03	0.00000E+00
11	11 TO 12		1.87611E+04	5.42360E+02	2.11884E-02	-4.22452E+01	-7.73641E-01	-2.01824E+00	-2.17845E-03	4.50349E+01
12	12 TO 13		1.87650E+04	5.42694E+02	2.11837E-02	-4.41279E+01	-4.72043E-01	-4.38556E-01	-3.62425E-03	4.50349E+01
13	13 TO 14		1.87666E+04	5.42674E+02	2.11740E-02	1.64978E+01	-5.41092E-01	-1.59565E+01	1.73410E-04	0.00000E+00
14	14 TO 15		1.87346E+04	5.42693E+02	2.11761E-02	1.78024E-01	2.83008E+00	-3.00860E+00	-4.97072E-04	0.00000E+00
15	15 TO 16		1.87364E+04	5.42687E+02	2.11760E-02	-2.51045E+00	2.82686E+00	-3.16845E-01	-4.37170E-04	0.00000E+00
16	16 TO 17		1.87381E+04	5.42684E+02	2.11753E-02	4.26449E+00	1.97096E+00	-6.23584E+00	-3.88094E-04	0.00000E+00
17	17 TO 18		2.71249E+04	5.42654E+02	2.11757E-02	4.88961E+00	-2.24385E+00	-2.64702E+00	-1.26104E-03	0.00000E+00
18	18 TO 19		2.71267E+04	5.69541E+02	2.18598E-02	4.20191E+00	-1.25008E+00	-2.95094E+00	8.87358E-04	0.00000E+00
19	19 TO 20		2.71289E+04	5.98226E+02	2.27121E-02	4.26925E+00	-1.21543E+00	-3.05398E+00	-1.57919E-04	0.00000E+00
20	20 TO 1		2.71316E+04	6.23015E+02	2.35743E-02	6.94983E+00	-2.27170E+00	-4.67828E+00	-1.58221E-04	0.00000E+00
21	21 TO 1		9.85954E+02	5.42605E+02	2.11760E-02	1.56704E+01	-3.65510E+00	-1.20156E+01	-2.16183E-04	0.00000E+00
22	22 TO 1		5.43934E+01	5.42574E+02	2.11791E-02	-2.68147E+00	2.68913E+00	-7.71619E-03	-5.57454E-05	0.00000E+00
23	23 TO 24		9.34106E+03	6.24965E+02	2.36664E-02	9.43845E+00	-9.27544E-01	-8.50961E+00	1.29256E-03	0.00000E+00
24	24 TO 25		9.34561E+03	6.24742E+02	2.36553E-02	5.01922E+00	-2.46509E+00	-2.55524E+00	-1.11757E-03	0.00000E+00
25	25 TO 26		9.34966E+03	6.03657E+02	2.29090E-02	6.89226E+00	-3.23974E+00	-3.65339E+00	-8.68428E-04	0.00000E+00
26	26 TO 28		9.35368E+03	5.83867E+02	2.22874E-02	8.57380E+00	-3.13361E+00	-5.44091E+00	-7.16705E-04	0.00000E+00
28	28 TO 29		9.36097E+03	5.59044E+02	2.16000E-02	2.11367E+00	3.20449E+00	-5.32060E+00	-2.43402E-03	0.00000E+00
29	29 TO 30		9.36436E+03	5.49497E+02	2.13588E-02	3.35141E-02	3.43933E+00	-3.47458E+00	-1.73864E-03	0.00000E+00
30	30 TO 31		9.36749E+03	5.43152E+02	2.12053E-02	-1.20190E-01	2.69388E+00	-2.57467E+00	-9.86843E-04	0.00000E+00
31	31 TO 32		9.37110E+03	5.42881E+02	2.11982E-02	1.38954E+00	2.47352E+00	-3.86851E+00	-5.44558E-03	0.00000E+00
32	32 TO 33		9.37424E+03	5.42678E+02	2.11959E-02	-4.22585E+01	-7.73520E-01	-2.01637E+00	-3.40801E-03	4.50450E+01
33	33 TO 34		9.37787E+03	5.42850E+02	2.11874E-02	-4.41392E+01	-4.71961E-01	-4.38216E-01	-4.38974E-03	4.50450E+01
34	34 TO 35		9.37922E+03	5.42777E+02	2.11764E-02	1.64821E+01	-5.41056E-01	-1.59452E+01	-4.08684E-03	0.00000E+00
35	35 TO 36		9.36367E+03	5.42753E+02	2.11775E-02	1.76830E-01	2.82993E+00	-3.00657E+00	1.92021E-04	0.00000E+00
36	36 TO 37		9.36483E+03	5.42721E+02	2.11768E-02	-2.51268E+00	2.82842E+00	-3.16638E-01	-9.02374E-04	0.00000E+00
37	37 TO 17		9.36586E+03	5.42701E+02	2.11757E-02	4.24825E+00	1.96930E+00	-6.21829E+00	-7.42595E-04	0.00000E+00
39	39 TO 40		7.40492E+02	6.91947E+02	2.70109E-02	3.00873E+00	5.56823E+00	-8.41101E+00	1.65943E-01	0.00000E+00
40	40 TO 23		7.45020E+02	6.89562E+02	2.67050E-02	6.92559E-02	1.02845E+00	-1.19595E+00	-9.82397E-02	0.00000E+00
42	17 TO 21		9.85613E+02	5.42657E+02	2.11758E-02	4.77434E+00	-3.58937E+00	-1.18513E+00	-1.60015E-04	0.00000E+00
43	1 TO 23		9.45204E+03	6.19950E+02	2.34633E-02	1.45822E+01	1.34645E-01	-1.47177E+01	-8.36191E-04	0.00000E+00
44	35 TO 22		1.68924E+01	5.42690E+02	2.11767E-02	2.83663E+01	-2.67239E+00	-2.56933E+01	5.62878E-04	0.00000E+00
45	14 TO 22		3.37925E+01	5.42629E+02	2.11753E-02	2.82793E+01	-2.67249E+00	-2.56072E+01	-4.42451E-04	0.00000E+00
75	23 TO 900	EXT-HEN	8.58196E+02	6.21622E+02	2.35402E-02	2.16359E+03	1.53011E-01	2.16392E+03	-5.91027E-04	0.00000E+00
100	701 TO 101		9.25306E+02	4.17325E+02	1.91383E-02	8.12867E+00	-5.98091E+00	-2.20344E+00	-5.56750E-02	0.00000E+00
101	101 TO 131		9.46769E+02	1.19853E+03	5.50101E-01	3.71186E+00	-1.65066E+00	-2.05116E+00	1.00368E-02	0.00000E+00
131	131 TO 132		9.46632E+02	1.19605E+03	5.53339E-01	1.74245E+01	2.86212E-01	-1.76747E+01	3.60065E-02	0.00000E+00
200	801 TO 201		1.88040E+03	4.17322E+02	1.91384E-02	8.28972E+00	-5.98886E+00	-2.27262E+00	2.82484E-02	0.00000E+00
201	201 TO 231		1.85905E+03	1.19857E+03	5.51154E-01	3.62516E+00	-1.64503E+00	-1.98420E+00	-4.06672E-03	0.00000E+00
231	231 TO 232		1.85909E+03	1.19616E+03	5.54266E-01	1.67394E+01	2.85832E-01	-1.70419E+01	-1.66698E-02	0.00000E+00
500	500 TO 13		0.00000E+00	5.42721E+02	2.11750E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00
501	501 TO 34		0.00000E+00	5.42823E+02	2.11774E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00
901	132 TO 901		9.46376E+02	1.19830E+03	5.68373E-01	1.37803E+01	1.52404E-03	-1.37624E+01	1.94398E-02	0.00000E+00
902	232 TO 902		1.85908E+03	1.19831E+03	5.68700E-01	1.32867E+01	1.46851E-03	-1.33038E+01	-1.56006E-02	0.00000E+00

800	0 TO 801	1.88049E+03	4.17260E+02	1.91375E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
700	0 TO 701	9.25370E+02	4.17260E+02	1.91373E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
601	0 TO 36	0.00000E+00	5.42728E+02	2.11773E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
600	0 TO 15	0.00000E+00	5.42695E+02	2.11766E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
290	0 TO 201	0.00000E+00	5.17125E+02	2.17631E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
254	0 TO 232	0.00000E+00	1.19889E+03	5.68378E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
253	0 TO 232	0.00000E+00	1.19889E+03	5.68378E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
252	0 TO 232	0.00000E+00	1.19889E+03	5.68378E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
251	0 TO 232	0.00000E+00	1.19889E+03	5.68378E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
235	0 TO 232	0.00000E+00	1.19889E+03	5.68378E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
234	0 TO 232	0.00000E+00	1.19889E+03	5.68378E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
232	0 TO 232	0.00000E+00	1.19840E+03	5.90342E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
190	0 TO 101	0.00000E+00	5.17395E+02	2.17807E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
154	0 TO 132	0.00000E+00	1.19890E+03	5.68003E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
153	0 TO 132	0.00000E+00	1.19890E+03	5.68003E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
152	0 TO 132	0.00000E+00	1.19890E+03	5.68003E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
151	0 TO 132	0.00000E+00	1.19890E+03	5.68003E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
135	0 TO 132	0.00000E+00	1.19890E+03	5.68003E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
134	0 TO 132	0.00000E+00	1.19890E+03	5.68003E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
132	0 TO 132	0.00000E+00	1.19840E+03	5.90342E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
95	0 TO 34	0.00000E+00	5.42822E+02	2.11774E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
94	0 TO 13	0.00000E+00	5.42719E+02	2.11750E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
92	0 TO 13	0.00000E+00	5.42721E+02	2.11750E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

PUMP NUMBER	VOLUME NUMBER	PUMP SPEED (RPM)	NORM. PUMP TORQUE	NORM. FRIC. TORQUE	NORM. MOT. TORQUE	POWER TO H2O (BTU/HR)
1	33	1.19000E+03	9.96474E-01	1.00000E+00	0.00000E+00	1.37329E+07
2	12	1.19000E+03	9.96446E-01	1.00000E+00	0.00000E+00	2.74650E+07

HEAT COND. NUMBER	VOL. NUM.	H. T. MODE	SURF. FLUX (BTU/HR-FT ²)	CRIT. FLUX (BTU/HR-FT ²)	H. T. COEF. (BTU/H-F ² -F)	SURF. TEMP. (DEG. F)	MASS FLUX (LBM/HR-FT ²)	STORD ENRGY (BTU)	POWR TO H2O (BTU/HR)
1	RIGHT 18	1	1.84716E+05	1.25322E+06	5.72857E+03	5.99638E+02	2.35766E+06	7.22918E+06	2.62708E+09
2	RIGHT 19	1	1.97087E+05	1.21679E+06	5.83935E+03	6.22399E+02	2.35783E+06	7.68453E+06	2.80301E+09
3	RIGHT 20	1	1.70353E+05	1.18741E+06	5.94200E+03	6.34670E+02	2.35804E+06	7.05571E+06	2.42280E+09
16	RIGHT 2	1	7.92318E+02	1.20757E+06	6.51599E+03	6.03936E+02	7.34718E+06	2.59293E+06	2.34526E+05
17	RIGHT 3	1	3.32398E+02	1.20701E+06	1.00995E+03	6.04174E+02	8.96579E+05	8.22193E+06	9.09642E+05
18	RIGHT 10	1	1.68851E+02	1.32636E+06	9.59815E+02	5.46283E+02	8.97474E+05	7.36809E+06	4.62078E+05
19	RIGHT 11	1	1.04445E+03	1.33114E+06	5.50072E+03	5.46240E+02	6.44427E+06	3.60604E+06	4.57468E+05
20	RIGHT 12	1	8.47046E+02	1.30407E+06	3.18891E+03	5.46699E+02	3.51812E+06	1.75112E+07	2.99346E+05
21	RIGHT 13	1	4.94723E+02	1.28401E+06	6.82884E+03	5.46521E+02	8.19876E+06	1.91559E+06	1.26649E+05
22	RIGHT 14	1	1.29367E+03	1.28875E+06	5.18960E+03	5.46694E+02	4.37590E+06	7.15981E+06	3.13587E+05
23	RIGHT 15	1	1.34361E+03	1.28885E+06	5.18250E+03	5.46699E+02	4.36844E+06	7.15993E+06	3.25690E+05
24	RIGHT 16	1	1.39081E+03	1.28737E+06	5.18281E+03	5.46710E+02	4.36884E+06	7.16011E+06	3.37134E+05
25	RIGHT 17	1	6.65614E+02	1.28822E+06	2.06946E+03	5.46749E+02	1.36078E+06	4.36567E+06	1.84841E+05
26	RIGHT 23	1	-2.12785E+03	1.20336E+06	6.99973E+03	6.06916E+02	7.99890E+06	1.29769E+06	-3.14922E+05
27	RIGHT 24	1	-1.59937E+03	1.20099E+06	1.01119E+03	6.05515E+02	8.94094E+05	4.11355E+06	-2.18841E+06
28	RIGHT 31	1	-1.29904E+02	1.32560E+06	9.59403E+02	5.46366E+02	8.96631E+05	3.68417E+06	-1.77748E+05
29	RIGHT 32	1	-1.66361E+02	1.33063E+06	5.49864E+03	5.46274E+02	6.43956E+06	1.80304E+06	-3.64331E+04
30	RIGHT 33	1	4.76450E+02	1.30380E+06	3.18782E+03	5.46708E+02	3.51617E+06	8.75563E+06	8.41886E+04
31	RIGHT 34	1	1.29275E+02	1.28381E+06	6.82689E+03	5.46550E+02	8.19515E+06	9.57804E+05	1.65472E+04
32	RIGHT 35	1	1.06158E+03	1.28860E+06	5.18818E+03	5.46698E+02	4.37419E+06	3.57991E+06	1.28663E+05
33	RIGHT 36	1	1.21426E+03	1.28874E+06	5.18114E+03	5.46701E+02	4.36688E+06	3.57997E+06	1.47169E+05
34	RIGHT 37	1	1.32387E+03	1.28729E+06	5.18148E+03	5.46711E+02	4.36738E+06	3.58006E+06	1.60453E+05
35	RIGHT 22	1	5.91426E+00	1.30148E+06	1.20258E+01	5.46804E+02	3.14536E+03	9.74427E+06	1.43835E+03
4	LEFT 4	1	-1.14060E+05	1.23659E+06	6.75618E+03	5.72903E+02	3.16169E+06		-1.34847E+09
	RIGHT 201	11	1.01066E+05	1.52740E+06	1.07422E+04	5.31359E+02	3.80968E+04	1.73675E+06	1.34899E+09
5	LEFT 5	1	-8.82281E+04	1.26578E+06	6.67280E+03	5.62805E+02	3.16215E+06		-1.26598E+09
	RIGHT 201	11	7.81810E+04	1.52740E+06	9.05229E+03	5.30587E+02	3.80968E+04	2.08710E+06	1.26652E+09
6	LEFT 7	1	-5.53281E+04	1.30388E+06	6.57193E+03	5.49616E+02	3.16280E+06		-7.93796E+08
	RIGHT 201	11	4.90335E+04	1.52740E+06	6.63263E+03	5.29343E+02	3.80968E+04	2.04204E+06	7.94235E+08

9	LEFT	9	1	-3.42974E+04	1.32728E+06	6.50932E+03	5.40852E+02	3.16384E+06	-4.05481E+08
	RIGHT	201	11	3.04014E+04	1.52740E+06	4.82266E+03	5.28254E+02	3.80968E+04	4.05786E+08
8	LEFT	8	1	-4.26517E+04	1.31833E+06	6.53428E+03	5.44380E+02	3.16343E+06	-6.12005E+08
	RIGHT	201	11	3.78028E+04	1.52740E+06	5.57665E+03	5.28729E+02	3.80968E+04	6.12402E+08
7	LEFT	7	1	-5.53281E+04	1.30388E+06	6.57193E+03	5.49616E+02	3.16280E+06	-7.93796E+08
	RIGHT	201	11	4.90335E+04	1.52740E+06	6.63263E+03	5.29343E+02	3.80968E+04	7.94235E+08
10	LEFT	25	1	-1.18725E+05	1.23168E+06	6.75987E+03	5.74868E+02	3.15388E+06	-7.01967E+08
	RIGHT	101	11	1.05045E+05	1.52756E+06	1.10278E+04	5.31684E+02	3.81446E+04	8.70290E+05
11	LEFT	26	1	-9.16533E+04	1.26201E+06	6.67315E+03	5.64310E+02	3.15528E+06	-6.57707E+08
	RIGHT	101	11	8.10494E+04	1.52756E+06	9.27693E+03	5.30895E+02	3.81446E+04	6.56642E+08
12	LEFT	28	1	-5.71024E+04	1.30170E+06	6.56902E+03	5.50496E+02	3.15724E+06	-4.09716E+08
	RIGHT	101	11	5.04392E+04	1.52756E+06	6.76213E+03	5.29617E+02	3.81446E+04	1.02217E+06
15	LEFT	30	1	-3.49990E+04	1.32620E+06	6.50631E+03	5.41309E+02	3.16018E+06	-2.06933E+08
	RIGHT	101	11	3.08731E+04	1.52756E+06	4.87482E+03	5.28491E+02	3.81446E+04	8.39711E+05
14	LEFT	29	1	-4.37928E+04	1.31679E+06	6.53143E+03	5.45012E+02	3.15907E+06	-3.14259E+08
	RIGHT	101	11	3.86543E+04	1.52756E+06	5.66287E+03	5.28984E+02	3.81446E+04	1.02397E+06
13	LEFT	28	1	-5.71024E+04	1.30170E+06	6.56902E+03	5.50496E+02	3.15724E+06	-4.09716E+08
	RIGHT	101	11	5.04392E+04	1.52756E+06	6.76213E+03	5.29617E+02	3.81446E+04	1.02217E+06

CORE SECT. NUMBER	HEAT COND. NUMBER	DEPTH REAC. EXT. ZR-H2O (FT)	DEPTH REAC. INT. ZR-H2O (FT)	HEAT GEN. ZR-H2O (BTU/HR)	COND. HEAT- ING RATE (BTU/HR)	DIR. MODER- ATOR HT RT (BTU/HR)	AVG. METAL TEMPERATURE (DEG. F)	CENTERLINE TEMPERATURE (DEG. F)
1	1	0.00000E+00	0.00000E+00	0.00000E+00	2.62611E+09	0.00000E+00	1.52189E+03	1.99756E+03
2	2	0.00000E+00	0.00000E+00	0.00000E+00	2.80202E+09	0.00000E+00	1.61284E+03	2.14143E+03
3	3	0.00000E+00	0.00000E+00	0.00000E+00	2.42177E+09	0.00000E+00	1.47711E+03	1.90588E+03

CONTEXT SAVE AT 10.00000 SECONDS STEP NO. 136

WRITTEN TO UNIT NUMBER 34

DATA RECORD NUMBER 11 WAS WRITTEN ON TAPE VSN = , DENSITY = PE, CREATED ON 90159
AND WAS LABELED RETRAN1

TIMING EDIT ACCUMULATED TIME = 15.625 SECONDS

SUBROUTINE	CPU TIME (SEC)	PERCENT	NUMBER OF CALLS
*****	*****	*****	*****
* STSTAT	2.604	16.67	1
* TRAN	13.021	83.33	1
* ADVFLO	2.604	16.67	147
DIRSOL	5.208	33.33	816
* CONTRL	2.604	16.67	6842
* ENERGY	7.813	50.00	562
* JUNPRP	2.604	16.67	149
* INDICATES OUTER LOOP TIME			

TIME STEP CONTROL SUMMARY FOR 13 ACTUAL TIME STEPS. THE AVERAGE TIME STEP SIZE FOR THE INTERVAL WAS 7.692308E-02 SECONDS.

NUMBER OF TIMES EACH TEST CONTROLLED TIME STEP SIZE

UPPER LIMIT	LOWER LIMIT	PRESSURE CHANGE	MASS CHANGE	ENERGY CHANGE	COURANT LIMIT	SAT LINE CROSSING	AIR MASS CHANGE	ZERO FLOW CROSSING	TRIP ACTUATION
0	0	0	0	0	13	0	0	0	0

VOLUMES CONTROLLING COURANT LIMIT
 (VOLUME INDEX ; TIMES CONTROLLING)

20; 11 131; 2

MINET, TIME= 15.00000 TIME STEP=0.00515 STEP NO. 204
 MINIMUM TIME CONSTANT= 5.238E-01 SEC, LIMIT KEY= 101

SYSTEM BOUNDARY CONDITIONS:

ID	NETWORK	FLOW(KG/S)	ENTHALPY(MJ/KG)	PRESSURE(MPA)	TEMP(K)	FLUID
413	1	835.416	2.787277	5.447114	542.090	H2O
412	1	1272.831	1.899121	3.892000	521.547	H2O
414	1	0.000	2.790917	4.892000	535.337	H2O
416	1	0.001	2.779037	5.000000	536.694	H2O
411	1	436.761	2.787034	5.447273	542.091	H2O
403	2	181.930	2.740000	4.230401	526.486	H2O
406	2	181.929	1.598621	4.200000	526.054	H2O
401	3	1272.610	0.808470	3.134044	463.120	H2O
402	3	411.327	0.971332	5.784366	498.809	H2O
404	3	861.542	0.971322	5.760888	498.807	H2O

SYSTEM VOLUMES

ID	PRESSURE(MPA)	ENTHALPY(MJ/KG)	TEMP(K)	LEVEL(RELATIVE)	HEAT INPUT(MJ/S)	NETWORK	REGIONS
111	5.445072	2.787194	542.066	0.000000	0.000000	1	1
112	5.167715	2.787219	538.759	0.000000	0.000000	1	1
101	5.989570	0.971413	498.820	0.000000	0.000000	3	1

SYSTEM SEGMENTS

SEG	NETWK	WIN(KG/S)	WOUT(KG/S)	WBAR(KG/S)	ALPHA IS IN MPA*SEC*SEC/KG/KG			POUT(MPA)	ALPHA, SEG	BETA(MPA)	CONNECTS TO:	
					EIN(MJ/KG)	EOUT(MJ/KG)	PIN(MPA)				IN	OUT
1	1	835.416	835.416	835.416	2.787277	2.787278	5.447114	5.445208	0.235E-08	-0.000272	413	111
2	1	1272.469	1272.663	1272.566	2.787196	2.787206	5.445072	5.167715	0.171E-06	-0.000012	111	112
3	1	1272.831	1272.831	1272.831	2.787222	1.899121	5.167715	3.892000	0.787E-06	0.000000	112	412
4	1	0.000	0.000	0.000	2.787265	2.790917	5.167844	4.892000	0.238E+09	0.000000	112	414
5	1	-0.001	0.001	0.000	2.787230	2.779037	5.444936	5.000000	0.228E+09	-0.000392	111	416
6	1	436.761	436.761	436.761	2.787034	2.787035	5.447273	5.445208	0.938E-08	-0.000272	411	111
7	2	181.930	181.929	181.930	2.740000	1.598621	4.230401	4.200000	0.943E-06	0.000817	403	406
8	3	1272.610	1272.621	1272.616	0.808470	0.971637	3.134044	5.989570	0.214E-05	6.317976	401	101
9	3	411.313	411.327	411.320	0.971413	0.971332	5.989570	5.784366	0.137E-05	0.026169	101	402
10	3	861.385	861.542	861.464	0.971413	0.971322	5.989570	5.760888	0.343E-06	0.026168	101	404

IN-SEGMENT DISTRIBUTIONS														
SEG	MODID	NODE	EIN(MJ/KG)	EBAR(MJ/KG)	EOUT(MJ/KG)	WIN(KG/S)	WOUT(KG/S)	TIN(K)	TBAR(K)	TOUT(K)	DENS(KG/M3)	QA(MJ/S)	JIN	JOUT
1	23	1	2.787277	2.787278	2.787278	835.416	835.416	542.078	542.078	542.078	27.714	0.000	1	2
2	22	2	2.787196	2.787198	2.787200	1272.469	1272.534	540.429	540.429	540.429	26.984	0.000	3	4
2	22	3	2.787200	2.787201	2.787202	1272.534	1272.598	540.429	540.429	540.429	26.983	0.000	4	5
2	22	4	2.787202	2.787204	2.787206	1272.598	1272.663	540.429	540.429	540.429	26.983	0.000	5	6
3	601	5	2.787222	2.343171	1.899121	1272.831	1272.831	530.613	530.613	530.613	30.981	-1130.401	7	8
4	502	6	2.787265	2.789092	2.790917	0.000	0.000	537.067	537.067	537.067	25.512	0.000	9	10
5	501	7	2.787230	2.783135	2.779037	-0.001	0.001	539.423	539.423	539.423	26.609	0.000	11	12
6	21	8	2.787034	2.787034	2.787035	436.761	436.761	542.079	542.079	542.079	27.719	0.000	13	14
7	301	9	2.740000	2.169310	1.598621	181.930	181.929	526.270	526.270	526.270	33.169	-207.652	15	16
8	1	10	0.808470	0.808470	0.808470	1272.610	1272.610	462.949	462.949	462.949	876.723	0.000	17	18
8	201	11	0.808470	0.808470	0.808469	1272.610	1272.611	462.949	462.949	462.949	876.723	0.000	18	19
8	2	12	0.808469	0.808469	0.808469	1272.611	1272.613	462.949	462.949	462.949	876.723	0.000	19	20
8	301	13	0.808469	0.890054	0.971638	1272.613	1272.617	462.949	481.159	498.911	856.754	207.652	20	21
8	3	14	0.971638	0.971638	0.971638	1272.617	1272.619	498.911	498.911	498.911	835.559	0.000	21	22
8	3	15	0.971638	0.971638	0.971637	1272.619	1272.621	498.911	498.911	498.911	835.559	0.000	22	23
9	5	16	0.971413	0.971397	0.971382	411.313	411.318	498.823	498.820	498.816	836.910	0.000	24	25
9	5	17	0.971382	0.971368	0.971354	411.318	411.323	498.816	498.813	498.810	836.918	0.000	25	26
9	5	18	0.971354	0.971343	0.971332	411.323	411.327	498.810	498.808	498.806	836.925	0.000	26	27
10	4	19	0.971413	0.971396	0.971378	861.385	861.439	498.823	498.820	498.816	836.900	0.000	28	29
10	4	20	0.971378	0.971362	0.971347	861.439	861.491	498.816	498.813	498.809	836.908	0.000	29	30
10	4	21	0.971347	0.971334	0.971322	861.491	861.542	498.809	498.807	498.804	836.916	0.000	30	31

SYSTEM MODULES

MODULE 1 IS B.C. NUMBER 1, MODID 413,NPATH= 0
 MODULE 2 IS PIPE NUMBER 1, MODID 23,NPATH= 2
 MODULE 3 IS VOL. NUMBER 1, MODID 111,NPATH= 1
 MODULE 4 IS PIPE NUMBER 2, MODID 22,NPATH= 3
 MODULE 5 IS VOL. NUMBER 2, MODID 112,NPATH= 1
 MODULE 6 IS TBSG NUMBER 1, MODID 601,NPATH= 1
 SPEED IN RPM IS 1800.00, EFFICIENCY IS 0.40392, POWER FROM GEN -1.074E+09 J/S
 MODULE 7 IS B.C. NUMBER 2, MODID 412,NPATH= 0
 MODULE 8 IS VALV NUMBER 1, MODID 502,NPATH= 1
 RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.688E-04,AS DETERMINED USING OPTION 1
 MODULE 9 IS B.C. NUMBER 3, MODID 414,NPATH= 0
 MODULE 10 IS VALV NUMBER 2, MODID 501,NPATH= 1
 RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.727E-04,AS DETERMINED USING OPTION 1
 MODULE 11 IS B.C. NUMBER 4, MODID 416,NPATH= 0
 MODULE 12 IS B.C. NUMBER 5, MODID 411,NPATH= 0
 MODULE 13 IS PIPE NUMBER 3, MODID 21,NPATH= 1
 MODULE 14 IS B.C. NUMBER 6, MODID 403,NPATH= 0
 MODULE 15 IS H.X. NUMBER 1, MODID 301,NPATH= 1

THE HEAT FLUX AREA CORRECTION FACTOR IS 0.782411

T	NOD	I	NOD	O	NOD	QINR(KJ/S/M)	TINR(K)	T	TUBE(K)	TOUTR(K)	QOUTR(KJ/S/M)	MODE,I	MODE,O	T,CORE	T,STRC
1	13	9	9.97483	481.15860	493.29846	526.27033	-9.97481	1	6	481.2	526.3				
MODULE 16	IS	B.C. NUMBER	7,	MODID 406,NPATH=	0										
MODULE 17	IS	B.C. NUMBER	8,	MODID 401,NPATH=	0										
MODULE 18	IS	PIPE NUMBER	4,	MODID 1,NPATH=	1										
MODULE 19	IS	PUMP NUMBER	1,	MODID 201,NPATH=	2										
PUMP SPEED= 3570.000 PUMP FLOW= 636.305 KG/S PUMP HEAD= 532.746 METERS															
MODULE 20	IS	PIPE NUMBER	5,	MODID 2,NPATH=	1										
MODULE 21	IS	PIPE NUMBER	6,	MODID 3,NPATH=	1										
MODULE 22	IS	VOL. NUMBER	3,	MODID 101,NPATH=	1										
MODULE 23	IS	PIPE NUMBER	7,	MODID 5,NPATH=	1										
MODULE 24	IS	B.C. NUMBER	9,	MODID 402,NPATH=	0										
MODULE 25	IS	PIPE NUMBER	8,	MODID 4,NPATH=	2										
MODULE 26	IS	B.C. NUMBER	10,	MODID 404,NPATH=	0										

STANDARD TIME STEP NUMBER = 15 ACTUAL TIME STEP NUMBER = 204 TIME = 1.500000E+01 SECONDS

	NORMALIZED CORE POWER	CORE POWER (MW)	THERMAL POWER (BTU/HR)	HEAT REMOV. RATE (BTU/HR)	ENERGY BALANCE (BTU)	WATER MASS BALANCE (LBM)	AIR MASS BALANCE (LBM)						
	5.682736E-02	1.307029E+02	4.871694E+08	0.000000E+00	4.055444E+08	8.836342E+05	3.306896E+03						
VOLUME NUMBER	AVG. PRES. (PSIA)	TOT. MASS (LB)	AVG. ENTH. (BTU/LB)	AVG. DEN. (LB/FT3)	AVG. TEMP. (DEG. F)	AVG. QUAL.	BUBB. MASS (LB)	MIX. LEV. (FT)	LIQ. MASS (LB)				
1	2.01988E+03	4.07039E+04	6.10139E+02	4.31185E+01	5.96651E+02	0.00000E+00	0.00000E+00	1.16700E+01	4.07039E+04				
2	1.99518E+03	8.19566E+03	6.12964E+02	4.29092E+01	5.98556E+02	0.00000E+00	0.00000E+00	3.59000E+00	8.19566E+03				
3	1.99614E+03	1.14763E+04	6.15955E+02	4.27106E+01	6.00630E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.14763E+04				
4	1.98944E+03	9.86370E+03	5.97966E+02	4.38777E+01	5.87942E+02	0.00000E+00	0.00000E+00	1.05400E+01	9.86370E+03				
5	1.98265E+03	1.01084E+04	5.80241E+02	4.49661E+01	5.74965E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.01084E+04				
7	1.97420E+03	2.08124E+04	5.57259E+02	4.62909E+01	5.57478E+02	0.00000E+00	0.00000E+00	9.40500E+00	2.08124E+04				
8	1.97213E+03	1.05168E+04	5.48302E+02	4.67829E+01	5.50473E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.05168E+04				
9	1.97212E+03	1.05892E+04	5.42316E+02	4.71050E+01	5.45737E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.05892E+04				
10	1.97386E+03	1.26584E+04	5.42245E+02	4.71098E+01	5.45684E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.26584E+04				
11	1.96529E+03	1.23051E+04	5.42147E+02	4.71098E+01	5.45590E+02	0.00000E+00	0.00000E+00	1.20500E+01	1.23051E+04				
12	2.01259E+03	1.80946E+04	5.42469E+02	4.71212E+01	5.45931E+02	0.00000E+00	0.00000E+00	5.19000E+00	1.80946E+04				
13	2.04698E+03	7.61880E+03	5.42392E+02	4.71460E+01	5.45932E+02	0.00000E+00	0.00000E+00	2.29000E+00	7.61880E+03				
14	2.03899E+03	8.67401E+03	5.42389E+02	4.71414E+01	5.45915E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.67401E+03				
15	2.03885E+03	8.67419E+03	5.42369E+02	4.71423E+01	5.45899E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.67419E+03				
16	2.04140E+03	8.67464E+03	5.42352E+02	4.71448E+01	5.45890E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.67464E+03				
17	2.04005E+03	3.43153E+04	5.42494E+02	4.71364E+01	5.46001E+02	0.00000E+00	0.00000E+00	9.79000E+00	3.43153E+04				
18	2.03458E+03	7.63908E+03	5.61342E+02	4.61019E+01	5.60761E+02	0.00000E+00	0.00000E+00	4.02000E+00	7.63908E+03				
19	2.03036E+03	7.43435E+03	5.82500E+02	4.48663E+01	5.76755E+02	0.00000E+00	0.00000E+00	4.00000E+00	7.43435E+03				
20	2.02605E+03	7.23456E+03	6.01863E+02	4.36606E+01	5.90824E+02	0.00000E+00	0.00000E+00	4.10000E+00	7.23456E+03				
21	2.03576E+03	2.00371E+03	5.42262E+02	4.71462E+01	5.45808E+02	0.00000E+00	0.00000E+00	1.21000E+01	2.00371E+03				
22	2.01769E+03	2.42175E+04	5.41940E+02	4.71524E+01	5.45519E+02	0.00000E+00	0.00000E+00	7.67000E+00	2.42175E+04				
23	1.99201E+03	4.03766E+03	6.22271E+02	4.22792E+01	6.04947E+02	0.00000E+00	0.00000E+00	3.59000E+00	4.03766E+03				
24	1.99676E+03	5.66799E+03	6.23896E+02	4.21726E+01	6.06063E+02	0.00000E+00	0.00000E+00	5.91000E+00	5.66799E+03				
25	1.99007E+03	4.89016E+03	6.03770E+02	4.35068E+01	5.92086E+02	0.00000E+00	0.00000E+00	1.05400E+01	4.89016E+03				
26	1.98330E+03	5.02609E+03	5.84387E+02	4.47161E+01	5.78039E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.02609E+03				
28	1.97486E+03	1.03748E+04	5.59758E+02	4.61513E+01	5.59414E+02	0.00000E+00	0.00000E+00	9.40500E+00	1.03748E+04				
29	1.97277E+03	5.24647E+03	5.50257E+02	4.66768E+01	5.52012E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.24647E+03				
30	1.97275E+03	5.28489E+03	5.43939E+02	4.70186E+01	5.47027E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.28489E+03				
31	1.97448E+03	6.32070E+03	5.43765E+02	4.70290E+01	5.46892E+02	0.00000E+00	0.00000E+00	5.91000E+00	6.32070E+03				
32	1.96587E+03	6.14267E+03	5.43569E+02	4.70342E+01	5.46721E+02	0.00000E+00	0.00000E+00	1.20500E+01	6.14267E+03				
33	2.01299E+03	9.03435E+03	5.43736E+02	4.70539E+01	5.46939E+02	0.00000E+00	0.00000E+00	5.19000E+00	9.03435E+03				
34	2.04715E+03	3.80427E+03	5.43588E+02	4.70825E+01	5.46883E+02	0.00000E+00	0.00000E+00	2.29000E+00	3.80427E+03				
35	2.03912E+03	4.32692E+03	5.43490E+02	4.70829E+01	5.46791E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.32692E+03				
36	2.03897E+03	4.32751E+03	5.43367E+02	4.70893E+01	5.46693E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.32751E+03				
37	2.04151E+03	4.32827E+03	5.43241E+02	4.70976E+01	5.46597E+02	0.00000E+00	0.00000E+00	8.62000E+00	4.32827E+03				
39	LIQ REG VAP REG	2.04772E+03	1.98000E+04	6.86808E+02	3.40940E+01	6.40191E+02	2.00711E-02	3.97408E+02	1.62609E+01	1.94026E+04			
			3.96097E+03	1.12495E+03	5.50705E+00	6.40191E+02	9.78724E-01	3.87670E+03	1.62609E+01	8.42728E+01			
40		1.99908E+03	1.19316E+03	6.82150E+02	3.38967E+01	6.36703E+02	2.18205E-02	2.60354E+01	9.23000E+00	1.16713E+03			
101		8.32468E+02	1.02991E+05	5.47874E+02	2.17786E+01	5.22368E+02	4.74860E-02	2.48776E+03	3.86293E+01	9.81005E+04			
131		8.23109E+02	2.45458E+02	1.19822E+03	1.80484E+00	5.21058E+02	9.99225E-01	2.45267E+02	3.24200E+01	1.90313E-01			
132		8.04847E+02	8.05034E+02	1.19823E+03	1.76349E+00	5.18469E+02	9.98489E-01	8.03817E+02	1.36300E+01	1.21657E+00			
201		8.28859E+02	2.06673E+05	5.46953E+02	2.18516E+01	5.21864E+02	4.69914E-02	4.74708E+03	3.80648E+01	1.96961E+05			
231		8.20170E+02	4.89023E+02	1.19834E+03	1.79788E+00	5.20644E+02	9.99275E-01	4.88668E+02	3.24200E+01	3.54661E-01			
232		8.03541E+02	1.53144E+03	1.19833E+03	1.76028E+00	5.18282E+02	9.98589E-01	1.52928E+03	1.36300E+01	2.16016E+00			
500		6.14695E+02	1.11384E+05	4.80058E+01	4.51859E+01	8.00000E+01	1.01516E-05	0.00000E+00	1.23900E+01	1.11383E+05			
501		6.14695E+02	5.56918E+04	4.80058E+01	4.51859E+01	8.00000E+01	1.01516E-05	0.00000E+00	1.23900E+01	5.56913E+04			

701	8.38978E+02	6.08227E+03	4.17295E+02	5.22532E+01	4.38190E+02	0.00000E+00	0.00000E+00	2.00000E+00	6.08227E+03
801	8.35522E+02	1.21643E+04	4.17287E+02	5.22521E+01	4.38184E+02	0.00000E+00	0.00000E+00	2.00000E+00	1.21643E+04
900	1.47000E+01	6.44163E+04	1.18996E+03	3.30340E-02	3.00000E+02	1.00000E+00	6.44163E+04	0.00000E+00	0.00000E+00
901	7.90060E+02	1.75436E+00	1.19821E+03	1.73014E+00	5.16340E+02	9.97882E-01	1.75065E+00	1.36300E+01	3.71630E-03
902	7.90037E+02	3.50811E+00	1.19831E+03	1.72984E+00	5.16336E+02	9.98032E-01	3.50120E+00	1.36300E+01	6.90368E-03

JUNCTION NUMBER	CONNECTS VOLUMES	CHOKES MODE	JUN. FLOW (LB/SEC)	JUN. ENTH. (BTU/LB)	JUN. SPVL. (FT3/LB)	P R E S S U R E STAG. PSI	S U R E ELEV. PSI	D I F F E R E N T FRIC. PSI	I A L S ACCL. PSI	P U M P PSI
1	1 TO 2		1.88792E+04	6.10134E+02	2.31915E-02	1.44384E+01	1.35587E-01	-1.44992E+01	7.47899E-02	0.00000E+00
2	2 TO 3		1.88049E+04	6.12997E+02	2.33064E-02	9.48332E+00	-9.38639E-01	-8.48955E+00	5.51339E-02	0.00000E+00
3	3 TO 4		1.87322E+04	6.15969E+02	2.34142E-02	5.04970E+00	-2.48221E+00	-2.54492E+00	2.25760E-02	0.00000E+00
4	4 TO 5		1.87051E+04	5.97973E+02	2.27922E-02	6.89997E+00	-3.25140E+00	-3.64189E+00	6.67678E-03	0.00000E+00
5	5 TO 7		1.86966E+04	5.80241E+02	2.22402E-02	8.56282E+00	-3.13685E+00	-5.42661E+00	-6.36392E-04	0.00000E+00
7	7 TO 8		1.87030E+04	5.57266E+02	2.16032E-02	2.10519E+00	3.20294E+00	-5.31108E+00	-2.94035E-03	0.00000E+00
8	8 TO 9		1.87086E+04	5.48309E+02	2.13754E-02	3.10941E-02	3.43605E+00	-3.46951E+00	-2.36609E-03	0.00000E+00
9	9 TO 10		1.87150E+04	5.42323E+02	2.12293E-02	-1.20389E-01	2.69065E+00	-2.57167E+00	-1.40497E-03	0.00000E+00
10	10 TO 11		1.87227E+04	5.42220E+02	2.12261E-02	1.38914E+00	2.47000E+00	-3.86519E+00	-6.04450E-03	0.00000E+00
11	11 TO 12		1.87300E+04	5.42148E+02	2.12270E-02	-4.21647E+01	-7.72285E-01	-2.01518E+00	-8.86293E-03	4.49433E+01
12	12 TO 13		1.87401E+04	5.42429E+02	2.12210E-02	-4.40414E+01	-4.71213E-01	-4.38152E-01	-7.43068E-03	4.49433E+01
13	13 TO 14		1.87441E+04	5.42392E+02	2.12108E-02	1.64800E+01	-5.40163E-01	-1.59463E+01	-6.42131E-03	0.00000E+00
14	14 TO 15		1.87146E+04	5.42395E+02	2.12125E-02	1.79822E-01	2.82524E+00	-3.00757E+00	-2.50571E-03	0.00000E+00
15	15 TO 16		1.87184E+04	5.42375E+02	2.12121E-02	-2.50621E+00	2.82207E+00	-3.16821E-01	-9.64590E-04	0.00000E+00
16	16 TO 17		1.87215E+04	5.42357E+02	2.12110E-02	4.26767E+00	1.96754E+00	-6.23732E+00	-2.10697E-03	0.00000E+00
17	17 TO 18		2.71330E+04	5.42485E+02	2.12152E-02	4.89178E+00	-2.24581E+00	-2.65586E+00	-9.89758E-03	0.00000E+00
18	18 TO 19		2.71185E+04	5.61348E+02	2.16916E-02	4.15214E+00	-1.26662E+00	-2.93066E+00	-4.51411E-02	0.00000E+00
19	19 TO 20		2.70766E+04	5.82519E+02	2.22895E-02	4.16517E+00	-1.24465E+00	-2.99135E+00	-7.08325E-02	0.00000E+00
20	20 TO 1		2.70057E+04	6.01897E+02	2.29056E-02	6.86188E+00	-2.30837E+00	-4.50138E+00	5.21300E-02	0.00000E+00
21	21 TO 1		9.77360E+02	5.42250E+02	2.12110E-02	1.54245E+01	-3.67177E+00	-1.18331E+01	-8.04439E-02	0.00000E+00
22	22 TO 1		5.73708E+01	5.41945E+02	2.12076E-02	-2.77326E+00	2.70769E+00	-9.73655E-03	-7.53060E-02	0.00000E+00
23	23 TO 24		9.36668E+03	6.22303E+02	2.36537E-02	9.51577E+00	-9.26192E-01	-8.55163E+00	3.79487E-02	0.00000E+00
24	24 TO 25		9.34894E+03	6.23899E+02	2.37125E-02	5.02780E+00	-2.45762E+00	-2.56263E+00	7.54948E-03	0.00000E+00
25	25 TO 26		9.34646E+03	6.03770E+02	2.29863E-02	6.88890E+00	-3.22871E+00	-3.66090E+00	-7.16175E-04	0.00000E+00
26	26 TO 28		9.34931E+03	5.84382E+02	2.23644E-02	8.57130E+00	-3.12324E+00	-5.45074E+00	-2.66955E-03	0.00000E+00
28	28 TO 29		9.35813E+03	5.59764E+02	2.16686E-02	2.13303E+00	3.19456E+00	-5.33023E+00	-2.63015E-03	0.00000E+00
29	29 TO 30		9.36246E+03	5.50263E+02	2.14240E-02	5.15023E-02	3.42901E+00	-3.48105E+00	-5.45450E-04	0.00000E+00
30	30 TO 31		9.36657E+03	5.43945E+02	2.12683E-02	-1.06448E-01	2.68584E+00	-2.58036E+00	-9.75389E-04	0.00000E+00
31	31 TO 32		9.37130E+03	5.43739E+02	2.12626E-02	1.40774E+00	2.46596E+00	-3.88007E+00	-6.36934E-03	0.00000E+00
32	32 TO 33		9.37581E+03	5.43569E+02	2.12611E-02	-4.19654E+01	-7.71196E-01	-2.02308E+00	-6.93047E-03	4.47528E+01
33	33 TO 34		9.38242E+03	5.43696E+02	2.12513E-02	-4.38493E+01	-4.70540E-01	-4.39930E-01	-6.98854E-03	4.47528E+01
34	34 TO 35		9.38515E+03	5.43587E+02	2.12393E-02	1.65490E+01	-5.39493E-01	-1.60124E+01	-2.87215E-03	0.00000E+00
35	35 TO 36		9.37130E+03	5.43495E+02	2.12389E-02	1.95324E-01	2.82191E+00	-3.02031E+00	-3.08332E-03	0.00000E+00
36	36 TO 37		9.37419E+03	5.43372E+02	2.12360E-02	-2.50430E+00	2.82071E+00	-3.18190E-01	-1.77937E-03	0.00000E+00
37	37 TO 17		9.37683E+03	5.43246E+02	2.12322E-02	4.28651E+00	1.96450E+00	-6.25136E+00	-3.51686E-04	0.00000E+00
39	39 TO 40		1.42365E+03	6.79411E+02	2.66161E-02	2.83315E+01	4.96244E+00	-3.06110E+01	2.68301E+00	0.00000E+00
40	40 TO 23		1.44662E+03	6.82176E+02	2.96729E-02	6.98187E+00	9.14697E-01	-5.64160E+00	2.25497E+00	0.00000E+00
42	17 TO 21		9.76661E+02	5.42488E+02	2.12153E-02	4.74648E+00	-3.58311E+00	-1.16626E+00	-2.89310E-03	0.00000E+00
43	1 TO 23		8.73347E+03	6.10140E+02	2.31917E-02	1.22566E+01	1.38144E-01	-1.24162E+01	-2.13856E-02	0.00000E+00
44	35 TO 22		1.68346E+01	5.43431E+02	2.12381E-02	2.82673E+01	-2.66662E+00	-2.56027E+01	-1.98066E-03	0.00000E+00
45	14 TO 22		3.36451E+01	5.42332E+02	2.12117E-02	2.81074E+01	-2.66837E+00	-2.54393E+01	-2.84929E-04	0.00000E+00
75	23 TO 900	EXT-HEN	7.87419E+02	6.19496E+02	2.35468E-02	2.00263E+03	1.53103E-01	2.00281E+03	1.25495E-01	0.00000E+00
100	701 TO 101		9.06795E+02	4.17297E+02	1.91376E-02	8.03928E+00	-5.95255E+00	-2.11464E+00	-3.06118E-02	0.00000E+00
101	101 TO 131		9.63217E+02	1.19848E+03	5.49042E-01	3.78189E+00	-1.65936E+00	-2.11917E+00	3.35993E-03	0.00000E+00
131	131 TO 132		9.63227E+02	1.19591E+03	5.52368E-01	1.80013E+01	2.86629E-01	-1.82755E+01	1.24640E-02	0.00000E+00
200	801 TO 201		1.89922E+03	4.17288E+02	1.91381E-02	8.33722E+00	-6.00161E+00	-2.31903E+00	1.65752E-02	0.00000E+00
201	201 TO 231		1.84057E+03	1.19859E+03	5.51586E-01	3.58142E+00	-1.64057E+00	-1.94660E+00	-5.75171E-03	0.00000E+00
231	231 TO 232		1.84081E+03	1.19621E+03	5.54631E-01	1.64092E+01	2.85694E-01	-1.67173E+01	-2.23802E-02	0.00000E+00
500	500 TO 13		0.00000E+00	5.42439E+02	2.12118E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00
501	501 TO 34		0.00000E+00	5.43634E+02	2.12403E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00
901	132 TO 901		9.63324E+02	1.19820E+03	5.67854E-01	1.42612E+01	1.57851E-03	-1.42525E+01	1.03640E-02	0.00000E+00
902	232 TO 902		1.84132E+03	1.19831E+03	5.68787E-01	1.30397E+01	1.44072E-03	-1.30511E+01	-9.93636E-03	0.00000E+00

800	0 TO 801	1.89926E+03	4.17277E+02	1.91378E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
700	0 TO 701	9.06812E+02	4.17279E+02	1.91373E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
601	0 TO 36	0.00000E+00	5.43380E+02	2.12365E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
600	0 TO 15	0.00000E+00	5.42383E+02	2.12126E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
290	0 TO 201	0.00000E+00	5.17001E+02	2.17444E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
254	0 TO 232	0.00000E+00	1.19889E+03	5.68470E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
253	0 TO 232	0.00000E+00	1.19889E+03	5.68470E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
252	0 TO 232	0.00000E+00	1.19889E+03	5.68470E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
251	0 TO 232	0.00000E+00	1.19889E+03	5.68470E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
235	0 TO 232	0.00000E+00	1.19889E+03	5.68470E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
234	0 TO 232	0.00000E+00	1.19889E+03	5.68470E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
232	0 TO 232	0.00000E+00	1.19840E+03	5.90342E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
190	0 TO 101	0.00000E+00	5.17693E+02	2.18203E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
154	0 TO 132	0.00000E+00	1.19883E+03	5.67474E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
153	0 TO 132	0.00000E+00	1.19883E+03	5.67474E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
152	0 TO 132	0.00000E+00	1.19883E+03	5.67474E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
151	0 TO 132	0.00000E+00	1.19883E+03	5.67474E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
135	0 TO 132	0.00000E+00	1.19883E+03	5.67474E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
134	0 TO 132	0.00000E+00	1.19883E+03	5.67474E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
132	0 TO 132	0.00000E+00	1.19840E+03	5.90342E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
95	0 TO 34	0.00000E+00	5.43632E+02	2.12404E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
94	0 TO 13	0.00000E+00	5.42437E+02	2.12118E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
92	0 TO 13	0.00000E+00	5.42439E+02	2.12118E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

VOLUME NUMBER	SLIP VEL. (FT/SEC)	VOID FRACTION	LIQUID FLOW (LB/SEC)	GAS FLOW (LB/SEC)	VOL. FLOW (LB/SEC)	GAS VEL. (FT/SEC)	LIQ. VEL. (FT/SEC)	VG/VL	FLOW REGIME
40	-6.30491E-01	1.41725E-01	1.40358E+03	3.15586E+01	1.43513E+03	7.11808E+01	7.05503E+01	1.00894E+00	2

JUNCTION NUMBER	SLIP VEL. (FT/SEC)	VOID FRACTION	LIQUID FLOW (LB/SEC)	GAS FLOW (LB/SEC)	SLIP CNVCTN (BTU/SEC)	GAS VEL. (FT/SEC)	LIQ. VEL. (FT/SEC)	VG/VL	FLOW REGIME
40	-1.26098E+00	1.48368E-01	1.41182E+03	3.36793E+01	2.66614E+02	7.27190E+01	7.14580E+01	1.01765E+00	2

PUMP NUMBER	VOLUME NUMBER	PUMP SPEED (RPM)	NORM. PUMP TORQUE	NORM. FRIC. TORQUE	NORM. MOT. TORQUE	POWER TO H2O (BTU/HR)
1	33	1.19000E+03	9.91717E-01	1.00000E+00	0.00000E+00	1.36673E+07
2	12	1.19000E+03	9.94555E-01	1.00000E+00	0.00000E+00	2.74129E+07

HEAT COND. NUMBER	VOL. NUM.	H.T. MODE	SURF. FLUX (BTU/HR-FT2)	CRIT. FLUX (BTU/HR-FT2)	H.T. COEF. (BTU/H-F2-F)	SURF. TEMP. (DEG. F)	MASS FLUX (LBM/HR-FT2)	STORD ENRGY (BTU)	POWR TO H2O (BTU/HR)
1	RIGHT 18	1	1.26563E+05	1.35032E+06	5.70346E+03	5.82957E+02	2.35856E+06	5.88226E+06	1.80001E+09
2	RIGHT 19	1	1.37387E+05	1.32119E+06	5.77589E+03	6.00558E+02	2.35526E+06	6.23441E+06	1.95395E+09
3	RIGHT 20	1	1.20227E+05	1.29570E+06	5.83807E+03	6.11443E+02	2.34903E+06	5.80356E+06	1.70989E+09
16	RIGHT 2	1	2.14376E+04	1.29403E+06	6.51374E+03	6.01871E+02	7.38805E+06	2.59126E+06	6.34552E+06
17	RIGHT 3	1	2.90486E+03	1.28953E+06	1.00844E+03	6.03529E+02	8.97987E+05	8.21916E+06	7.94945E+06
18	RIGHT 10	1	4.04784E+02	1.40815E+06	9.58921E+02	5.46106E+02	8.95643E+05	7.36711E+06	1.10773E+06
19	RIGHT 11	1	2.34028E+03	1.41221E+06	5.49655E+03	5.46017E+02	6.43276E+06	3.60578E+06	1.02504E+06
20	RIGHT 12	1	1.86135E+03	1.38962E+06	3.18713E+03	5.46516E+02	3.51286E+06	1.75101E+07	6.57800E+05
21	RIGHT 13	1	1.43471E+03	1.37290E+06	6.82625E+03	5.46142E+02	8.18846E+06	1.91532E+06	3.67286E+05
22	RIGHT 14	1	2.74257E+03	1.37689E+06	5.18819E+03	5.46444E+02	4.37104E+06	7.15921E+06	6.64798E+05
23	RIGHT 15	1	2.80556E+03	1.37700E+06	5.18170E+03	5.46441E+02	4.36428E+06	7.15931E+06	6.80069E+05
24	RIGHT 16	1	2.86630E+03	1.37579E+06	5.18260E+03	5.46443E+02	4.36535E+06	7.15947E+06	6.94791E+05
25	RIGHT 17	1	1.10231E+03	1.37627E+06	2.07125E+03	5.46533E+02	1.36106E+06	4.36534E+06	3.06110E+05
26	RIGHT 23	1	1.11019E+04	1.28275E+06	6.96819E+03	6.06559E+02	7.97286E+06	1.29764E+06	1.64308E+06
27	RIGHT 24	1	-1.60401E+02	1.27856E+06	1.01183E+03	6.05916E+02	8.95490E+05	4.11602E+06	-2.19477E+05
28	RIGHT 31	1	-2.25728E+02	1.40546E+06	9.60642E+02	5.46657E+02	8.96556E+05	3.68479E+06	-3.08863E+05
29	RIGHT 32	1	-1.11457E+03	1.40969E+06	5.50646E+03	5.46519E+02	6.43989E+06	1.80319E+06	-2.44090E+05
30	RIGHT 33	1	-5.28984E+02	1.38746E+06	3.19289E+03	5.46774E+02	3.51720E+06	8.75582E+06	-9.34715E+04
31	RIGHT 34	1	-4.09058E+01	1.37098E+06	6.83895E+03	5.46877E+02	8.19957E+06	9.57905E+05	-5.23594E+03
32	RIGHT 35	1	-4.14492E+02	1.37513E+06	5.19789E+03	5.46711E+02	4.37736E+06	3.57993E+06	-5.02365E+04
33	RIGHT 36	1	-1.52916E+02	1.37541E+06	5.19148E+03	5.46663E+02	4.37104E+06	3.57992E+06	-1.85334E+04

34	RIGHT	37	1	1.46922E+02	1.37436E+06	5.19247E+03	5.46625E+02	4.37260E+06	3.57995E+06	1.78069E+04
35	RIGHT	22	1	1.61895E+01	1.38803E+06	1.26198E+01	5.46803E+02	3.33909E+03	9.74427E+06	3.93728E+03
4	LEFT	4	1	-1.09775E+05	1.31747E+06	6.74267E+03	5.71672E+02	3.15785E+06		-1.29782E+09
	RIGHT	201	11	9.87421E+04	1.52733E+06	1.05748E+04	5.31202E+02	3.81008E+04	1.73451E+06	1.31797E+09
5	LEFT	5	1	-8.58813E+04	1.34611E+06	6.65970E+03	5.62075E+02	3.15480E+06		-1.23230E+09
	RIGHT	201	11	7.69170E+04	1.52733E+06	8.95264E+03	5.30456E+02	3.81008E+04	2.08540E+06	1.24605E+09
6	LEFT	7	1	-5.42772E+04	1.38455E+06	6.56168E+03	5.49208E+02	3.15463E+06		-7.78718E+08
	RIGHT	201	11	4.84313E+04	1.52733E+06	6.57689E+03	5.29229E+02	3.81008E+04	2.04100E+06	7.84481E+08
9	LEFT	9	1	-3.36928E+04	1.40883E+06	6.50224E+03	5.40556E+02	3.15664E+06		-3.98333E+08
	RIGHT	201	11	3.00250E+04	1.52733E+06	4.78181E+03	5.28144E+02	3.81008E+04	1.67759E+06	4.00763E+08
8	LEFT	8	1	-4.19156E+04	1.39941E+06	6.52573E+03	5.44051E+02	3.15564E+06		-6.01443E+08
	RIGHT	201	11	3.73609E+04	1.52733E+06	5.53199E+03	5.28618E+02	3.81008E+04	2.04527E+06	6.05244E+08
7	LEFT	7	1	-5.42772E+04	1.38455E+06	6.56168E+03	5.49208E+02	3.15463E+06		-7.78718E+08
	RIGHT	201	11	4.84313E+04	1.52733E+06	6.57689E+03	5.29229E+02	3.81008E+04	2.04100E+06	7.84481E+08
10	LEFT	25	1	-1.17264E+05	1.30901E+06	6.76225E+03	5.74750E+02	3.15401E+06		-6.93332E+08
	RIGHT	101	11	1.04448E+05	1.52772E+06	1.09914E+04	5.31871E+02	3.81031E+04	8.70380E+05	6.97216E+08
11	LEFT	26	1	-9.10832E+04	1.33973E+06	6.67638E+03	5.64398E+02	3.15406E+06		-6.53616E+08
	RIGHT	101	11	8.08732E+04	1.52772E+06	9.26809E+03	5.31094E+02	3.81031E+04	1.04570E+06	6.55215E+08
12	LEFT	28	1	-5.70580E+04	1.38040E+06	6.57449E+03	5.50736E+02	3.15600E+06		-4.09398E+08
	RIGHT	101	11	5.05767E+04	1.52772E+06	6.77778E+03	5.29830E+02	3.81031E+04	1.02265E+06	4.09707E+08
15	LEFT	30	1	-3.51557E+04	1.40598E+06	6.51387E+03	5.41630E+02	3.15958E+06		-2.07860E+08
	RIGHT	101	11	3.11639E+04	1.52772E+06	4.90782E+03	5.28718E+02	3.81031E+04	8.40183E+05	2.08028E+08
14	LEFT	29	1	-4.38777E+04	1.39605E+06	6.53812E+03	5.45301E+02	3.15817E+06		-3.14868E+08
	RIGHT	101	11	3.88871E+04	1.52772E+06	5.68841E+03	5.29204E+02	3.81031E+04	1.02451E+06	3.15053E+08
13	LEFT	28	1	-5.70580E+04	1.38040E+06	6.57449E+03	5.50736E+02	3.15600E+06		-4.09398E+08
	RIGHT	101	11	5.05767E+04	1.52772E+06	6.77778E+03	5.29830E+02	3.81031E+04	1.02265E+06	4.09707E+08

CORE SECT. NUMBER	HEAT COND. NUMBER	DEPTH REAC. EXT. ZR-H2O (FT)	DEPTH REAC. INT. ZR-H2O (FT)	HEAT GEN. ZR-H2O (BTU/HR)	COND. HEAT-ING RATE (BTU/HR)	DIR. MODER-ATOR HT RT (BTU/HR)	AVG. METAL TEMPERATURE (DEG. F)	CENTERLINE TEMPERATURE (DEG. F)
1	1	0.00000E+00	0.00000E+00	0.00000E+00	1.49235E+08	0.00000E+00	1.23592E+03	1.62204E+03
2	2	0.00000E+00	0.00000E+00	0.00000E+00	1.59232E+08	0.00000E+00	1.30814E+03	1.74206E+03
3	3	0.00000E+00	0.00000E+00	0.00000E+00	1.37623E+08	0.00000E+00	1.21208E+03	1.56006E+03

CONTEXT SAVE AT 15.00000 SECONDS STEP NO. 204

WRITTEN TO UNIT NUMBER 34

DATA RECORD NUMBER 16 WAS WRITTEN ON TAPE VSN = , DENSITY = PE, CREATED ON 90159
AND WAS LABELED RETRAN1

TIMING EDIT ACCUMULATED TIME = 23.438 SECONDS

SUBROUTINE	CPU TIME (SEC)	PERCENT	NUMBER OF CALLS
* STSTAT	2.604	11.11	1
* TRAN	20.833	88.89	1
* ADVFLO	2.604	11.11	215
DIRSOL	7.813	33.33	1224
* CONTRL	5.208	22.22	10102
* PRESUR	2.604	11.11	205
STATEW	2.604	11.11	9430
* ENERGY	10.417	44.44	834
* JUNPRP	2.604	11.11	217
* INDICATES OUTER LOOP TIME			

TIME STEP CONTROL SUMMARY FOR 14 ACTUAL TIME STEPS. THE AVERAGE TIME STEP SIZE FOR THE INTERVAL WAS 7.142857E-02 SECONDS.

NUMBER OF TIMES EACH TEST CONTROLLED TIME STEP SIZE

UPPER LIMIT	LOWER LIMIT	PRESSURE CHANGE	MASS CHANGE	ENERGY CHANGE	COURANT LIMIT	SAT LINE CROSSING	AIR MASS CHANGE	ZERO FLOW CROSSING	TRIP ACTUATION
0	0	0	0	0	14	0	0	0	0

VOLUMES CONTROLLING COURANT LIMIT
 (VOLUME INDEX ; TIMES CONTROLLING)

131; 14

MINET, TIME= 20.00000 TIME STEP=0.06028 STEP NO. 276
 MINIMUM TIME CONSTANT= 5.236E-01 SEC, LIMIT KEY= 101

SYSTEM BOUNDARY CONDITIONS:

ID	NETWORK	FLOW(KG/S)	ENTHALPY(MJ/KG)	PRESSURE(MPA)	TEMP(K)	FLUID
413	1	786.357	2.786817	5.371124	541.197	H2O
412	1	1235.831	1.924393	3.892000	521.547	H2O
414	1	0.012	2.789645	4.892000	535.337	H2O
416	1	0.014	2.777608	5.000000	536.694	H2O
411	1	433.652	2.786402	5.371442	541.201	H2O
403	2	181.930	2.740000	4.230390	526.485	H2O
406	2	181.888	1.598443	4.200000	526.054	H2O
401	3	1272.610	0.808470	3.044521	463.131	H2O
402	3	397.938	0.971270	5.709104	498.798	H2O
404	3	876.492	0.971253	5.660795	498.795	H2O

SYSTEM VOLUMES

ID	PRESSURE(MPA)	ENTHALPY(MJ/KG)	TEMP(K)	LEVEL(RELATIVE)	HEAT INPUT(MJ/S)	NETWORK	REGIONS
111	5.369220	2.785934	541.174	0.000000	0.000000	1	1
112	5.102990	2.785150	537.969	0.000000	0.000000	1	1
101	5.898971	0.971349	498.809	0.000000	0.000000	3	1

SYSTEM SEGMENTS

SEG	NETWK	WIN(KG/S)	WOUT(KG/S)	WBAR(KG/S)	ALPHA IS IN MPA*SEC*SEC/KG/KG			POUT(MPA)	ALPHA, SEG	BETA(MPA)	CONNECTS TO:	
					EIN(MJ/KG)	EOUT(MJ/KG)	PIN(MPA)				IN	OUT
1	1	786.357	786.367	786.362	2.786817	2.786814	5.371124	5.369354	0.243E-08	-0.000270	413	111
2	1	1226.138	1230.868	1228.510	2.785956	2.785495	5.369220	5.102990	0.176E-06	-0.000342	111	112
3	1	1235.831	1235.831	1235.831	2.785198	1.924393	5.102990	3.892000	0.787E-06	0.000000	112	412
4	1	-0.011	0.012	0.000	2.785993	2.789645	5.103118	4.892000	0.240E+09	0.000000	112	414
5	1	-0.014	0.014	0.000	2.785801	2.777608	5.369086	5.000000	0.230E+09	-0.000389	111	416
6	1	433.652	433.658	433.655	2.786402	2.786400	5.371442	5.369354	0.967E-08	-0.000270	411	111
7	2	181.930	181.888	181.909	2.740000	1.598443	4.230390	4.200000	0.943E-06	0.000817	403	406
8	3	1272.610	1272.928	1272.787	0.808470	0.971542	3.044521	5.898971	0.214E-05	6.317440	401	101
9	3	397.789	397.938	397.863	0.971351	0.971270	5.898971	5.709104	0.137E-05	0.026156	101	402
10	3	876.170	876.492	876.331	0.971351	0.971253	5.898971	5.660795	0.343E-06	0.026153	101	404

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IN-SEGMENT DISTRIBUTIONS														
SEG	MODID	NODE	EIN(MJ/KG)	EBAR(MJ/KG)	EOUT(MJ/KG)	WIN(KG/S)	WOUT(KG/S)	TIN(K)	TBAR(K)	TOUT(K)	DENS(KG/M3)	QA(MJ/S)	JIN	JOUT
1	23	1	2.786817	2.786816	2.786814	786.357	786.367	541.186	541.186	541.186	27.335	0.000	1	2
2	22	2	2.785956	2.785872	2.785788	1226.138	1227.725	539.587	539.587	539.587	26.647	0.000	3	4
2	22	3	2.785788	2.785711	2.785634	1227.725	1229.302	539.587	539.587	539.587	26.649	0.000	4	5
2	22	4	2.785634	2.785564	2.785495	1229.302	1230.868	539.587	539.587	539.587	26.651	0.000	5	6
3	601	5	2.785198	2.354796	1.924393	1235.831	1235.831	530.177	530.177	530.177	30.480	-1063.808	7	8
4	502	6	2.785993	2.787819	2.789645	-0.011	0.012	536.664	536.664	536.664	25.367	0.000	9	10
5	501	7	2.785801	2.781706	2.777608	-0.014	0.014	538.964	538.964	538.964	26.438	0.000	11	12
6	21	8	2.786402	2.786401	2.786400	433.652	433.658	541.188	541.188	541.188	27.342	0.000	13	14
7	301	9	2.740000	2.169222	1.598443	181.930	181.888	526.270	526.270	526.270	33.171	-207.707	15	16
8	1	10	0.808470	0.808469	0.808468	1272.610	1272.613	462.960	462.960	462.959	876.643	0.000	17	18
8	201	11	0.808468	0.808459	0.808451	1272.613	1272.635	462.959	462.957	462.956	876.645	0.000	18	19
8	2	12	0.808451	0.808435	0.808418	1272.635	1272.691	462.956	462.952	462.948	876.651	0.000	19	20
8	301	13	0.808418	0.889992	0.971567	1272.691	1272.826	462.948	481.152	498.899	856.687	207.717	20	21
8	3	14	0.971567	0.971559	0.971552	1272.826	1272.878	498.899	498.897	498.895	835.494	0.000	21	22
8	3	15	0.971552	0.971547	0.971542	1272.878	1272.928	498.895	498.894	498.893	835.498	0.000	22	23
9	5	16	0.971351	0.971338	0.971325	397.789	397.838	498.812	498.809	498.807	836.848	0.000	24	25
9	5	17	0.971325	0.971311	0.971297	397.838	397.888	498.807	498.804	498.801	836.855	0.000	25	26
9	5	18	0.971297	0.971283	0.971270	397.888	397.938	498.801	498.798	498.795	836.862	0.000	26	27
10	4	19	0.971351	0.971335	0.971318	876.170	876.277	498.813	498.809	498.806	836.826	0.000	28	29
10	4	20	0.971318	0.971301	0.971284	876.277	876.385	498.806	498.802	498.799	836.835	0.000	29	30
10	4	21	0.971284	0.971269	0.971253	876.385	876.492	498.799	498.795	498.792	836.843	0.000	30	31

SYSTEM MODULES

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MODULE 1 IS B.C. NUMBER 1, MODID 413,NPATH= 0
MODULE 2 IS PIPE NUMBER 1, MODID 23,NPATH= 2
MODULE 3 IS VOL. NUMBER 1, MODID 111,NPATH= 1
MODULE 4 IS PIPE NUMBER 2, MODID 22,NPATH= 3
MODULE 5 IS VOL. NUMBER 2, MODID 112,NPATH= 1
MODULE 6 IS TBSG NUMBER 1, MODID 601,NPATH= 1
SPEED IN RPM IS 1800.00, EFFICIENCY IS 0.40920, POWER FROM GEN -1.011E+09 J/S
MODULE 7 IS B.C. NUMBER 2, MODID 412,NPATH= 0
MODULE 8 IS VALV NUMBER 1, MODID 502,NPATH= 1
RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.680E-04,AS DETERMINED USING OPTION 1
MODULE 9 IS B.C. NUMBER 3, MODID 414,NPATH= 0
MODULE 10 IS VALV NUMBER 2, MODID 501,NPATH= 1
RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.717E-04,AS DETERMINED USING OPTION 1
MODULE 11 IS B.C. NUMBER 4, MODID 416,NPATH= 0
MODULE 12 IS B.C. NUMBER 5, MODID 411,NPATH= 0
MODULE 13 IS PIPE NUMBER 3, MODID 21,NPATH= 1
MODULE 14 IS B.C. NUMBER 6, MODID 403,NPATH= 0
MODULE 15 IS H.X. NUMBER 1, MODID 301,NPATH= 1
THE HEAT FLUX AREA CORRECTION FACTOR IS 0.782411
T NOD I NOD O NOD QINR(KJ/S/M ) TINR(K) T TUBE(K) TOUTR(K) QOUTR(KJ/S/M ) MODE,I MODE,O T,CORE T,STRC
-----
1 13 9 9.97794 481.15206 493.29045 526.27025 -9.97746 1 6 481.2 526.3
MODULE 16 IS B.C. NUMBER 7, MODID 406,NPATH= 0
MODULE 17 IS B.C. NUMBER 8, MODID 401,NPATH= 0
MODULE 18 IS PIPE NUMBER 4, MODID 1,NPATH= 1
MODULE 19 IS PUMP NUMBER 1, MODID 201,NPATH= 2
PUMP SPEED= 3570.000 PUMP FLOW= 636.311 KG/S PUMP HEAD= 532.744 METERS
MODULE 20 IS PIPE NUMBER 5, MODID 2,NPATH= 1
MODULE 21 IS PIPE NUMBER 6, MODID 3,NPATH= 1
MODULE 22 IS VOL. NUMBER 3, MODID 101,NPATH= 1
MODULE 23 IS PIPE NUMBER 7, MODID 5,NPATH= 1
MODULE 24 IS B.C. NUMBER 9, MODID 402,NPATH= 0
MODULE 25 IS PIPE NUMBER 8, MODID 4,NPATH= 2
MODULE 26 IS B.C. NUMBER 10, MODID 404,NPATH= 0
    
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STANDARD TIME STEP NUMBER = 20 ACTUAL TIME STEP NUMBER = 276 TIME = 2.000000E+01 SECONDS

NORMALIZED CORE POWER	CORE POWER (MW)	THERMAL POWER (BTU/HR)	HEAT REMOV. RATE (BTU/HR)	ENERGY BALANCE (BTU)	WATER MASS BALANCE (LBM)	AIR MASS BALANCE (LBM)
3.499685E-02	8.049276E+01	3.157301E+08	0.000000E+00	3.981093E+08	8.799615E+05	3.306896E+03

VOLUME NUMBER	AVG. PRES. (PSIA)	TOT. MASS (LB)	AVG. ENTH. (BTU/LB)	AVG. DEN. (LB/FT3)	AVG. TEMP. (DEG. F)	AVG. QUAL.	BUBB. MASS (LB)	MIX. LEV. (FT)	LIQ. MASS (LB)
1	1.79031E+03	4.24666E+04	5.77508E+02	4.49858E+01	5.72484E+02	0.00000E+00	0.00000E+00	1.16700E+01	4.24666E+04
2	1.76619E+03	8.56123E+03	5.79885E+02	4.48232E+01	5.74196E+02	0.00000E+00	0.00000E+00	3.59000E+00	8.56123E+03
3	1.76714E+03	1.19777E+04	5.83916E+02	4.45766E+01	5.77177E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.19777E+04
4	1.76035E+03	1.01711E+04	5.72819E+02	4.52449E+01	5.68906E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.01711E+04
5	1.75344E+03	1.03168E+04	5.61662E+02	4.58934E+01	5.60421E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.03168E+04
7	1.74488E+03	2.10062E+04	5.46811E+02	4.67219E+01	5.48874E+02	0.00000E+00	0.00000E+00	9.40500E+00	2.10062E+04
8	1.74280E+03	1.05756E+04	5.40854E+02	4.70443E+01	5.44166E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.05756E+04
9	1.74278E+03	1.06230E+04	5.36903E+02	4.72556E+01	5.41021E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.06230E+04
10	1.74452E+03	1.26797E+04	5.38172E+02	4.71890E+01	5.42036E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.26797E+04
11	1.73590E+03	1.23104E+04	5.39174E+02	4.71303E+01	5.42819E+02	0.00000E+00	0.00000E+00	1.20500E+01	1.23104E+04
12	1.78311E+03	1.80794E+04	5.40611E+02	4.70818E+01	5.44045E+02	0.00000E+00	0.00000E+00	5.19000E+00	1.80794E+04
13	1.81740E+03	7.60903E+03	5.40928E+02	4.70856E+01	5.44358E+02	0.00000E+00	0.00000E+00	2.29000E+00	7.60903E+03
14	1.80939E+03	8.65942E+03	5.41276E+02	4.70621E+01	5.44620E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.65942E+03
15	1.80922E+03	8.65703E+03	5.41516E+02	4.70491E+01	5.44810E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.65703E+03
16	1.81172E+03	8.65569E+03	5.41680E+02	4.70418E+01	5.44944E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.65569E+03
17	1.81031E+03	3.42216E+04	5.42297E+02	4.70077E+01	5.45431E+02	0.00000E+00	0.00000E+00	9.79000E+00	3.42216E+04
18	1.80476E+03	7.70626E+03	5.51394E+02	4.65073E+01	5.52578E+02	0.00000E+00	0.00000E+00	4.02000E+00	7.70626E+03
19	1.80057E+03	7.60830E+03	5.61828E+02	4.59161E+01	5.60646E+02	0.00000E+00	0.00000E+00	4.00000E+00	7.60830E+03
20	1.79635E+03	7.51582E+03	5.71356E+02	4.53580E+01	5.67885E+02	0.00000E+00	0.00000E+00	4.10000E+00	7.51582E+03
21	1.80608E+03	1.99833E+03	5.42032E+02	4.70195E+01	5.45213E+02	0.00000E+00	0.00000E+00	1.21000E+01	1.99833E+03
22	1.78808E+03	2.41707E+04	5.41050E+02	4.70613E+01	5.44402E+02	0.00000E+00	0.00000E+00	7.67000E+00	2.41707E+04
23	1.76309E+03	4.20378E+03	5.92764E+02	4.40187E+01	5.83623E+02	0.00000E+00	0.00000E+00	3.59000E+00	4.20378E+03
24	1.76768E+03	5.88364E+03	5.96599E+02	4.37771E+01	5.86399E+02	0.00000E+00	0.00000E+00	5.91000E+00	5.88364E+03
25	1.76089E+03	5.01471E+03	5.83215E+02	4.46149E+01	5.76646E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.01471E+03
26	1.75402E+03	5.10463E+03	5.69878E+02	4.54149E+01	5.66676E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.10463E+03
28	1.74548E+03	1.04358E+04	5.52225E+02	4.64228E+01	5.53112E+02	0.00000E+00	0.00000E+00	9.40500E+00	1.04358E+04
29	1.74338E+03	5.26148E+03	5.45179E+02	4.68103E+01	5.47587E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.26148E+03
30	1.74335E+03	5.29010E+03	5.40476E+02	4.70650E+01	5.43867E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.29010E+03
31	1.74508E+03	6.31877E+03	5.41431E+02	4.70146E+01	5.44628E+02	0.00000E+00	0.00000E+00	5.91000E+00	6.31877E+03
32	1.73646E+03	6.13457E+03	5.42120E+02	4.69722E+01	5.45158E+02	0.00000E+00	0.00000E+00	1.20500E+01	6.13457E+03
33	1.78346E+03	9.01363E+03	5.43138E+02	4.69460E+01	5.46048E+02	0.00000E+00	0.00000E+00	5.19000E+00	9.01363E+03
34	1.81752E+03	3.79429E+03	5.43284E+02	4.69590E+01	5.46226E+02	0.00000E+00	0.00000E+00	2.29000E+00	3.79429E+03
35	1.80950E+03	4.31429E+03	5.43443E+02	4.69455E+01	5.46337E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.31429E+03
36	1.80933E+03	4.31394E+03	5.43510E+02	4.69417E+01	5.46390E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.31394E+03
37	1.81183E+03	4.31403E+03	5.43521E+02	4.69427E+01	5.46403E+02	0.00000E+00	0.00000E+00	8.62000E+00	4.31403E+03
39	LIQ REG VAP REG	1.83545E+03	1.08838E+04	6.65439E+02	3.34086E+01	6.24447E+02	2.55197E-02	9.12183E+00	1.06061E+04
			4.66006E+03	1.13165E+03	4.78338E+00	6.24447E+02	9.63170E-01	4.48843E+03	9.12183E+00
40		1.76931E+03	1.16949E+03	6.58356E+02	3.32241E+01	6.19239E+02	2.64960E-02	3.09868E+01	9.23000E+00
101		8.21104E+02	1.02652E+05	5.45787E+02	2.17069E+02	5.20776E+02	4.71249E-02	2.46337E+03	3.85904E+01
131		8.11883E+02	2.41946E+02	1.19838E+03	1.77901E+00	5.19470E+02	9.98999E-01	2.41703E+02	3.24200E+01
132		7.93838E+02	7.93986E+02	1.19795E+03	1.73929E+00	5.16887E+02	9.97657E-01	7.92125E+02	1.36300E+01
201		8.13574E+02	2.07285E+05	5.43704E+02	2.19163E+01	5.19712E+02	4.58805E-02	4.42822E+03	3.73819E+01
231		8.05748E+02	4.79965E+02	1.19861E+03	1.76458E+00	5.18598E+02	9.99082E-01	4.79525E+02	3.24200E+01
232		7.91080E+02	1.50738E+03	1.19813E+03	1.73262E+00	5.16488E+02	9.97812E-01	1.50408E+03	1.36300E+01
500		6.14668E+02	1.11384E+05	4.80058E+01	4.51859E+01	8.00000E+01	1.01520E-05	0.00000E+00	1.23900E+01
501		6.14668E+02	5.56918E+04	4.80058E+01	4.51859E+01	8.00000E+01	1.01520E-05	0.00000E+00	1.23900E+01

701	8.27548E+02	6.08194E+03	4.17247E+02	5.22503E+01	4.38151E+02	0.00000E+00	0.00000E+00	2.00000E+00	6.08194E+03
801	8.20358E+02	1.21633E+04	4.17232E+02	5.22479E+01	4.38140E+02	0.00000E+00	0.00000E+00	2.00000E+00	1.21633E+04
900	1.47000E+01	6.44163E+04	1.18996E+03	3.30340E-02	3.00000E+02	1.00000E+00	6.44163E+04	0.00000E+00	0.00000E+00
901	7.79062E+02	1.72987E+00	1.19794E+03	1.70598E+00	5.14736E+02	9.97074E-01	1.72481E+00	1.36300E+01	5.06092E-03
902	7.79016E+02	3.45866E+00	1.19812E+03	1.70546E+00	5.14730E+02	9.97330E-01	3.44943E+00	1.36300E+01	9.23583E-03

JUNCTION NUMBER	CONNECTS VOLUMES	CHOKE MODE	JUN. FLOW (LB/SEC)	JUN. ENTH. (BTU/LB)	JUN. SPVL. (FT3/LB)	P R E S S U R E D I F F E R E N T I A L S				PUMP PSI
						STAG. PSI	ELEV. PSI	FRIC. PSI	ACCL. PSI	
1	1 TO 2		1.91245E+04	5.77767E+02	2.22360E-02	1.41367E+01	1.41195E-01	-1.42698E+01	8.10084E-03	0.00000E+00
2	2 TO 3		1.90693E+04	5.80199E+02	2.23188E-02	9.34034E+00	-9.79562E-01	-8.36094E+00	-1.67619E-04	0.00000E+00
3	3 TO 4		1.89858E+04	5.84238E+02	2.24428E-02	5.10402E+00	-2.56964E+00	-2.52001E+00	1.43643E-02	0.00000E+00
4	4 TO 5		1.89285E+04	5.73099E+02	2.21105E-02	6.98693E+00	-3.33440E+00	-3.63727E+00	1.52538E-02	0.00000E+00
5	5 TO 7		1.88830E+04	5.61895E+02	2.17964E-02	8.64675E+00	-3.18386E+00	-5.44258E+00	2.03174E-02	0.00000E+00
7	7 TO 8		1.88238E+04	5.46989E+02	2.14076E-02	2.12384E+00	3.22594E+00	-5.33725E+00	1.25233E-02	0.00000E+00
8	8 TO 9		1.88005E+04	5.41003E+02	2.12595E-02	4.36318E-02	3.45070E+00	-3.48634E+00	7.98874E-03	0.00000E+00
9	9 TO 10		1.87817E+04	5.37031E+02	2.11640E-02	-1.11574E-01	2.69750E+00	-2.58190E+00	4.03213E-03	0.00000E+00
10	10 TO 11		1.87619E+04	5.38256E+02	2.11926E-02	1.41394E+00	2.47174E+00	-3.87400E+00	1.16688E-02	0.00000E+00
11	11 TO 12		1.87462E+04	5.39269E+02	2.12195E-02	-4.20544E+01	-7.71504E-01	-2.01746E+00	1.34364E-02	4.48568E+01
12	12 TO 13		1.87318E+04	5.40641E+02	2.12398E-02	-4.39384E+01	-4.70795E-01	-4.38118E-01	9.48491E-03	4.48568E+01
13	13 TO 14		1.87273E+04	5.40987E+02	2.12388E-02	1.64802E+01	-5.39242E-01	-1.59363E+01	4.57183E-03	0.00000E+00
14	14 TO 15		1.86905E+04	5.41328E+02	2.12488E-02	1.87447E-01	2.82002E+00	-3.00452E+00	2.95338E-03	0.00000E+00
15	15 TO 16		1.86892E+04	5.41557E+02	2.12544E-02	-2.49974E+00	2.81618E+00	-3.16416E-01	2.39175E-05	0.00000E+00
16	16 TO 17		1.86894E+04	5.41712E+02	2.12575E-02	4.26537E+00	1.96295E+00	-6.22760E+00	7.24068E-04	0.00000E+00
17	17 TO 18		2.70777E+04	5.42296E+02	2.12729E-02	4.89542E+00	-2.24709E+00	-2.64969E+00	-1.36974E-03	0.00000E+00
18	18 TO 19		2.70694E+04	5.51473E+02	2.15037E-02	4.17319E+00	-1.28673E+00	-2.89654E+00	-1.00799E-02	0.00000E+00
19	19 TO 20		2.70469E+04	5.61996E+02	2.17831E-02	4.19185E+00	-1.28314E+00	-2.92516E+00	-1.64505E-02	0.00000E+00
20	20 TO 1		2.70106E+04	5.71606E+02	2.20536E-02	6.74351E+00	-2.40502E+00	-4.34798E+00	-9.48329E-03	0.00000E+00
21	21 TO 1		9.68857E+02	5.42022E+02	2.12676E-02	1.53557E+01	-3.74038E+00	-1.16561E+01	-4.06801E-02	0.00000E+00
22	22 TO 1		5.84490E+01	5.41063E+02	2.12483E-02	-2.80844E+00	2.77960E+00	-9.08939E-03	-3.79264E-02	0.00000E+00
23	23 TO 24		9.51115E+03	5.93094E+02	2.27278E-02	9.43608E+00	-9.61963E-01	-8.47194E+00	2.17214E-03	0.00000E+00
24	24 TO 25		9.46784E+03	5.96922E+02	2.28531E-02	5.09079E+00	-2.53016E+00	-2.54516E+00	1.54722E-02	0.00000E+00
25	25 TO 26		9.43906E+03	5.83489E+02	2.24230E-02	6.96724E+00	-3.29384E+00	-3.65815E+00	1.52462E-02	0.00000E+00
26	26 TO 28		9.41712E+03	5.70099E+02	2.20259E-02	8.63552E+00	-3.15679E+00	-5.45994E+00	1.87858E-02	0.00000E+00
28	28 TO 29		9.39071E+03	5.52386E+02	2.15452E-02	2.14347E+00	3.20779E+00	-5.34104E+00	1.02160E-02	0.00000E+00
29	29 TO 30		9.38086E+03	5.45310E+02	2.13654E-02	5.70821E-02	3.43523E+00	-3.48621E+00	6.10772E-03	0.00000E+00
30	30 TO 31		9.37338E+03	5.40584E+02	2.12492E-02	-1.02338E-01	2.68701E+00	-2.58160E+00	3.07451E-03	0.00000E+00
31	31 TO 32		9.36619E+03	5.41492E+02	2.12706E-02	1.42123E+00	2.46327E+00	-3.87652E+00	7.98838E-03	0.00000E+00
32	32 TO 33		9.36127E+03	5.42189E+02	2.12903E-02	-4.18452E+01	-7.69336E-01	-2.01933E+00	5.28980E-03	4.46391E+01
33	33 TO 34		9.35827E+03	5.43142E+02	2.13007E-02	-4.37276E+01	-4.69450E-01	-4.38698E-01	3.43581E-03	4.46391E+01
34	34 TO 35		9.35775E+03	5.43318E+02	2.12955E-02	1.64988E+01	-5.37919E-01	-1.59607E+01	1.19538E-04	0.00000E+00
35	35 TO 36		9.34122E+03	5.43472E+02	2.13010E-02	1.96226E-01	2.81338E+00	-3.00964E+00	-3.24241E-05	0.00000E+00
36	36 TO 37		9.34221E+03	5.43531E+02	2.13025E-02	-2.49506E+00	2.81169E+00	-3.16997E-01	-3.66735E-04	0.00000E+00
37	37 TO 17		9.34378E+03	5.43535E+02	2.13019E-02	4.26751E+00	1.95838E+00	-6.22646E+00	-5.65579E-04	0.00000E+00
39	39 TO 40		1.66664E+03	6.55466E+02	2.58931E-02	3.78394E+01	3.45089E+00	-4.10105E+01	2.79766E-01	0.00000E+00
40	40 TO 23		1.66010E+03	6.58671E+02	3.04050E-02	6.32108E+00	8.85678E-01	-7.53231E+00	-3.25548E-01	0.00000E+00
42	17 TO 21		9.67905E+02	5.42299E+02	2.12729E-02	4.72227E+00	-3.57350E+00	-1.14961E+00	-8.47233E-04	0.00000E+00
43	1 TO 23		8.65772E+03	5.77775E+02	2.22362E-02	1.15747E+01	1.44468E-01	-1.16952E+01	2.39520E-02	0.00000E+00
44	35 TO 22		1.67877E+01	5.43409E+02	2.13002E-02	2.81874E+01	-2.66010E+00	-2.55272E+01	6.27002E-05	0.00000E+00
45	14 TO 22		3.35916E+01	5.41265E+02	2.12480E-02	2.80564E+01	-2.66356E+00	-2.53918E+01	1.00408E-03	0.00000E+00
75	23 TO 900	EXT-HEN	7.77131E+02	5.90573E+02	2.26451E-02	1.77542E+03	1.60100E-01	1.77570E+03	2.30436E-02	0.00000E+00
100	701 TO 101		8.77354E+02	4.17250E+02	1.91387E-02	7.85784E+00	-5.94880E+00	-1.98086E+00	-7.18207E-02	0.00000E+00
101	101 TO 131		9.49255E+02	1.19880E+03	5.56927E-01	3.71032E+00	-1.64112E+00	-2.09098E+00	-2.17776E-02	0.00000E+00
131	131 TO 132		9.50886E+02	1.19605E+03	5.60154E-01	1.77291E+01	2.82690E-01	-1.80863E+01	-7.44602E-02	0.00000E+00
200	801 TO 201		1.93248E+03	4.17234E+02	1.91395E-02	8.50241E+00	-6.06091E+00	-2.39963E+00	4.18639E-02	0.00000E+00
201	201 TO 231		1.71485E+03	1.19901E+03	5.62373E-01	3.29896E+00	-1.60698E+00	-1.73083E+00	-3.88435E-02	0.00000E+00
231	231 TO 232		1.71846E+03	1.19667E+03	5.64984E-01	1.44579E+01	2.80760E-01	-1.48941E+01	-1.55382E-01	0.00000E+00
500	500 TO 13		0.00000E+00	5.41033E+02	2.12398E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00
501	501 TO 34		0.00000E+00	5.43365E+02	2.12965E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00
901	132 TO 901		9.55996E+02	1.19793E+03	5.75540E-01	1.44896E+01	1.57669E-03	-1.42419E+01	2.49313E-01	0.00000E+00
902	232 TO 902		1.72874E+03	1.19811E+03	5.77566E-01	1.19274E+01	1.28783E-03	-1.17205E+01	2.08181E-01	0.00000E+00

800	0 TO 801	1.93210E+03	4.17250E+02	1.91397E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
700	0 TO 701	8.77193E+02	4.17254E+02	1.91387E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
601	0 TO 36	0.00000E+00	5.43539E+02	2.13030E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
600	0 TO 15	0.00000E+00	5.41565E+02	2.12549E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
290	0 TO 201	0.00000E+00	5.14324E+02	2.16018E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
254	0 TO 232	0.00000E+00	1.19863E+03	5.77264E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
253	0 TO 232	0.00000E+00	1.19863E+03	5.77264E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
252	0 TO 232	0.00000E+00	1.19863E+03	5.77264E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
251	0 TO 232	0.00000E+00	1.19863E+03	5.77264E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
235	0 TO 232	0.00000E+00	1.19863E+03	5.77264E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
234	0 TO 232	0.00000E+00	1.19863E+03	5.77264E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
232	0 TO 232	0.00000E+00	1.19840E+03	5.90342E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
190	0 TO 101	0.00000E+00	5.15785E+02	2.17734E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
154	0 TO 132	0.00000E+00	1.19856E+03	5.75150E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
153	0 TO 132	0.00000E+00	1.19856E+03	5.75150E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
152	0 TO 132	0.00000E+00	1.19856E+03	5.75150E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
151	0 TO 132	0.00000E+00	1.19856E+03	5.75150E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
135	0 TO 132	0.00000E+00	1.19856E+03	5.75150E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
134	0 TO 132	0.00000E+00	1.19856E+03	5.75150E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
132	0 TO 132	0.00000E+00	1.19840E+03	5.90342E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
95	0 TO 34	0.00000E+00	5.43364E+02	2.12966E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
94	0 TO 13	0.00000E+00	5.41032E+02	2.12399E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
92	0 TO 13	0.00000E+00	5.41033E+02	2.12398E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

VOLUME NUMBER	SLIP VEL. (FT/SEC)	VOID FRACTION	LIQUID FLOW (LB/SEC)	GAS FLOW (LB/SEC)	VOL. FLOW (LB/SEC)	GAS VEL. (FT/SEC)	LIQ. VEL. (FT/SEC)	VG/VL	FLOW REGIME
40	-5.93765E-01	1.99893E-01	1.61891E+03	4.44598E+01	1.66337E+03	8.40198E+01	8.34261E+01	1.00712E+00	2

JUNCTION NUMBER	SLIP VEL. (FT/SEC)	VOID FRACTION	LIQUID FLOW (LB/SEC)	GAS FLOW (LB/SEC)	SLIP CNVCTN (BTU/SEC)	GAS VEL. (FT/SEC)	LIQ. VEL. (FT/SEC)	VG/VL	FLOW REGIME
40	-1.18753E+00	2.09789E-01	1.61505E+03	4.71925E+01	3.25453E+02	8.53885E+01	8.42010E+01	1.01410E+00	2

PUMP NUMBER	VOLUME NUMBER	PUMP SPEED (RPM)	NORM. PUMP TORQUE	NORM. FRIC. TORQUE	NORM. MOT. TORQUE	POWER TO H2O (BTU/HR)
1	33	1.19000E+03	9.89307E-01	1.00000E+00	0.00000E+00	1.36341E+07
2	12	1.19000E+03	9.93150E-01	1.00000E+00	0.00000E+00	2.73742E+07

HEAT COND. NUMBER	VOL. NUM.	H.T. MODE	SURF. FLUX (BTU/HR-FT2)	CRIT. FLUX (BTU/HR-FT2)	H.T. COEF. (BTU/H-F2-F)	SURF. TEMP. (DEG. F)	MASS FLUX (LBM/HR-FT2)	STORD ENRGY (BTU)	POWR TO H2O (BTU/HR)
1	RIGHT	18	6.05783E+04	1.46156E+06	5.66288E+03	5.63344E+02	2.35323E+06	4.16717E+06	8.61558E+08
2	RIGHT	19	6.69800E+04	1.44579E+06	5.69812E+03	5.72537E+02	2.35179E+06	4.36131E+06	9.52605E+08
3	RIGHT	20	5.81830E+04	1.43174E+06	5.72776E+03	5.78238E+02	2.34909E+06	4.17540E+06	8.27491E+08
16	RIGHT	2	3.83752E+04	1.42801E+06	6.44702E+03	5.80388E+02	7.48878E+06	2.57360E+06	1.13591E+07
17	RIGHT	3	1.60695E+04	1.42128E+06	9.98740E+02	5.93517E+02	9.10362E+05	8.17739E+06	4.39757E+07
18	RIGHT	10	2.75219E+03	1.50469E+06	9.59616E+02	5.44996E+02	8.98016E+05	7.36248E+06	7.53165E+06
19	RIGHT	11	1.25181E+04	1.50582E+06	5.49855E+03	5.45175E+02	6.44131E+06	3.60477E+06	5.48293E+06
20	RIGHT	12	6.10463E+03	1.48736E+06	3.18735E+03	5.46019E+02	3.51321E+06	1.75072E+07	2.15737E+06
21	RIGHT	13	4.48887E+03	1.47439E+06	6.82375E+03	5.45066E+02	8.18229E+06	1.91458E+06	1.14915E+06
22	RIGHT	14	6.29821E+03	1.47679E+06	5.18569E+03	5.45875E+02	4.36593E+06	7.15785E+06	1.52669E+06
23	RIGHT	15	5.41806E+03	1.47647E+06	5.17861E+03	5.45888E+02	4.35768E+06	7.15798E+06	1.31334E+06
24	RIGHT	16	4.80186E+03	1.47529E+06	5.17902E+03	5.45896E+02	4.35764E+06	7.15816E+06	1.16397E+06
25	RIGHT	17	1.51056E+03	1.47481E+06	2.06907E+03	5.46172E+02	1.35755E+06	4.36478E+06	4.19482E+05
26	RIGHT	23	3.54500E+04	1.40869E+06	6.90802E+03	5.88995E+02	8.08028E+06	1.29058E+06	5.24660E+06
27	RIGHT	24	1.20256E+04	1.40131E+06	1.00485E+03	5.98611E+02	9.08027E+05	4.10352E+06	1.64546E+07
28	RIGHT	31	1.41893E+03	1.49893E+06	9.60319E+02	5.46178E+02	8.96526E+05	3.68436E+06	1.94152E+06
29	RIGHT	32	6.36536E+03	1.50060E+06	5.50280E+03	5.46374E+02	6.43257E+06	1.80310E+06	1.39401E+06
30	RIGHT	33	2.11236E+03	1.48300E+06	3.18995E+03	5.46750E+02	3.50978E+06	8.75575E+06	3.73255E+05
31	RIGHT	34	2.22793E+03	1.47044E+06	6.83033E+03	5.46583E+02	8.17690E+06	9.57811E+05	2.85175E+05
32	RIGHT	35	1.68860E+03	1.47316E+06	5.19084E+03	5.46685E+02	4.36387E+06	3.57989E+06	2.04658E+05
33	RIGHT	36	1.16489E+03	1.47312E+06	5.18396E+03	5.46631E+02	4.35643E+06	3.57988E+06	1.41185E+05

34	RIGHT	37	1	8.47120E+02	1.47220E+06	5.18455E+03	5.46577E+02	4.35711E+06	3.57989E+06	1.02671E+05
35	RIGHT	22	1	2.96558E+01	1.48495E+06	1.24247E+01	5.46800E+02	3.27234E+03	9.74426E+06	7.21229E+03
4	LEFT	4	1	-7.85737E+04	1.44127E+06	6.70618E+03	5.57411E+02	3.19773E+06		-9.28936E+08
	RIGHT	201	11	7.16003E+04	1.52556E+06	8.49294E+03	5.28193E+02	3.71759E+04	1.70570E+06	9.55691E+08
5	LEFT	5	1	-6.30442E+04	1.46183E+06	6.64438E+03	5.51122E+02	3.18892E+06		-9.04614E+08
	RIGHT	201	11	5.76313E+04	1.52556E+06	7.34887E+03	5.27605E+02	3.71759E+04	2.05749E+06	9.33622E+08
6	LEFT	7	1	-4.24194E+04	1.48966E+06	6.56747E+03	5.42555E+02	3.17998E+06		-6.08593E+08
	RIGHT	201	11	3.90288E+04	1.52556E+06	5.66724E+03	5.26649E+02	3.71759E+04	2.02248E+06	6.32182E+08
9	LEFT	9	1	-2.88297E+04	1.50745E+06	6.50866E+03	5.36693E+02	3.16941E+06		-3.40838E+08
	RIGHT	201	11	2.67233E+04	1.52556E+06	4.40259E+03	5.25833E+02	3.71759E+04	1.66729E+06	3.56692E+08
8	LEFT	8	1	-3.42116E+04	1.50059E+06	6.53104E+03	5.39045E+02	3.17296E+06		-4.90899E+08
	RIGHT	201	11	3.16084E+04	1.52556E+06	4.92398E+03	5.26182E+02	3.71759E+04	2.03021E+06	5.12053E+08
7	LEFT	7	1	-4.24194E+04	1.48966E+06	6.56747E+03	5.42555E+02	3.17998E+06		-6.08593E+08
	RIGHT	201	11	3.90288E+04	1.52556E+06	5.66724E+03	5.26649E+02	3.71759E+04	2.02248E+06	6.32182E+08
10	LEFT	25	1	-9.10667E+04	1.42444E+06	6.73621E+03	5.63339E+02	3.18925E+06		-5.38437E+08
	RIGHT	101	11	8.25343E+04	1.52647E+06	9.36027E+03	5.29638E+02	3.72366E+04	8.59027E+05	5.50939E+08
11	LEFT	26	1	-7.26217E+04	1.44816E+06	6.66493E+03	5.55957E+02	3.18060E+06		-5.21136E+08
	RIGHT	101	11	6.59646E+04	1.52647E+06	8.06132E+03	5.29004E+02	3.72366E+04	1.03508E+06	5.34429E+08
12	LEFT	28	1	-4.81455E+04	1.48031E+06	6.57735E+03	5.45917E+02	3.17239E+06		-3.45449E+08
	RIGHT	101	11	4.39316E+04	1.52647E+06	6.14776E+03	5.27967E+02	3.72366E+04	1.01597E+06	3.55877E+08
15	LEFT	30	1	-3.19915E+04	1.50112E+06	6.51345E+03	5.39040E+02	3.16335E+06		-1.89151E+08
	RIGHT	101	11	2.93466E+04	1.52647E+06	4.69790E+03	5.27068E+02	3.72366E+04	8.36653E+05	1.95897E+08
14	LEFT	29	1	-3.84202E+04	1.49301E+06	6.53785E+03	5.41812E+02	3.16626E+06		-2.75705E+08
	RIGHT	101	11	3.51622E+04	1.52647E+06	5.29968E+03	5.27456E+02	3.72366E+04	1.01922E+06	2.84875E+08
13	LEFT	28	1	-4.81455E+04	1.48031E+06	6.57735E+03	5.45917E+02	3.17239E+06		-3.45449E+08
	RIGHT	101	11	4.39316E+04	1.52647E+06	6.14776E+03	5.27967E+02	3.72366E+04	1.01597E+06	3.55877E+08

CORE SECT. NUMBER	HEAT COND. NUMBER	DEPTH REAC. EXT. ZR-H2O (FT)	DEPTH REAC. INT. ZR-H2O (FT)	HEAT GEN. ZR-H2O (BTU/HR)	COND. HEAT- ING RATE (BTU/HR)	DIR. MODER- ATOR HT RT (BTU/HR)	AVG. METAL TEMPERATURE (DEG. F)	CENTERLINE TEMPERATURE (DEG. F)
1	1	0.00000E+00	0.00000E+00	0.00000E+00	9.19054E+07	0.00000E+00	8.62882E+02	1.00779E+03
2	2	0.00000E+00	0.00000E+00	0.00000E+00	9.80619E+07	0.00000E+00	9.03477E+02	1.06832E+03
3	3	0.00000E+00	0.00000E+00	0.00000E+00	8.47544E+07	0.00000E+00	8.61182E+02	9.96615E+02

CONTEXT SAVE AT 20.00000 SECONDS STEP NO. 276

WRITTEN TO UNIT NUMBER 34

DATA RECORD NUMBER 21 WAS WRITTEN ON TAPE VSN = , DENSITY = PE, CREATED ON 90159
AND WAS LABELED RETRAN1

TIMING EDIT ACCUMULATED TIME = 31.250 SECONDS

SUBROUTINE	CPU TIME (SEC)	PERCENT	NUMBER OF CALLS
* STSTAT	2.604	8.33	1
* TRAN	28.646	91.67	1
* ADVFLO	7.813	25.00	287
DIRSOL			1656
* CONTRL	7.813	25.00	13551
* PRESUR	2.604	8.33	277
STATEW			12742
* ENERGY	10.417	33.33	1122
* JUNPRP	5.208	16.67	289
* INDICATES OUTER LOOP TIME			

TIME STEP CONTROL SUMMARY FOR 16 ACTUAL TIME STEPS. THE AVERAGE TIME STEP SIZE FOR THE INTERVAL WAS 6.250000E-02 SECONDS.

NUMBER OF TIMES EACH TEST CONTROLLED TIME STEP SIZE

UPPER LIMIT	LOWER LIMIT	PRESSURE CHANGE	MASS CHANGE	ENERGY CHANGE	COURANT LIMIT	SAT LINE CROSSING	AIR MASS CHANGE	ZERO FLOW CROSSING	TRIP ACTUATION
0	0	0	0	0	12	0	0	0	2

VOLUMES CONTROLLING COURANT LIMIT
 (VOLUME INDEX ; TIMES CONTROLLING)

131; 12

TRIP ID(S) CONTROLLING TIME STEP
 (TRIP ID ; TIMES CONTROLLING)

16; 2

MINET, TIME= 25.00000 TIME STEP=0.04745 STEP NO. 620
 MINIMUM TIME CONSTANT= 5.235E-01 SEC, LIMIT KEY= 101

SYSTEM BOUNDARY CONDITIONS:

ID	NETWORK	FLOW(KG/S)	ENTHALPY(MJ/KG)	PRESSURE(MPA)	TEMP(K)	FLUID
413	1	705.027	2.788009	5.162120	538.691	H2O
412	1	1127.027	2.005541	3.892000	521.547	H2O
414	1	0.017	2.786010	4.892000	535.337	H2O
416	1	0.020	2.773623	5.000000	536.694	H2O
411	1	397.850	2.787527	5.162474	538.696	H2O
403	2	181.930	2.740000	4.230402	526.486	H2O
406	2	181.988	1.598331	4.200000	526.054	H2O
401	3	1272.610	0.808470	2.920309	463.146	H2O
402	3	392.286	0.971163	5.589501	498.778	H2O
404	3	880.511	0.971154	5.534806	498.778	H2O

SYSTEM VOLUMES

ID	PRESSURE(MPA)	ENTHALPY(MJ/KG)	TEMP(K)	LEVEL(RELATIVE)	HEAT INPUT(MJ/S)	NETWORK	REGIONS
111	5.160406	2.786179	538.670	0.000000	0.000000	1	1
112	4.920110	2.783541	535.692	0.000000	0.000000	1	1
101	5.774369	0.971246	498.791	0.000000	0.000000	3	1

SYSTEM SEGMENTS

SEG	NETWK	WIN(KG/S)	WOUT(KG/S)	WBAR(KG/S)	ALPHA IS IN MPA*SEC*SEC/KG/KG			CONNECTS TO:				
					EIN(MJ/KG)	EOUT(MJ/KG)	PIN(MPA)	POUT(MPA)	ALPHA, SEG	BETA(MPA)	IN	OUT
1	1	705.027	705.042	705.034	2.788009	2.788004	5.162120	5.160535	0.268E-08	-0.000260	413	111
2	1	1112.156	1119.365	1115.763	2.786168	2.784865	5.160406	4.920110	0.193E-06	-0.000475	111	112
3	1	1127.027	1127.027	1127.027	2.783537	2.005541	4.920110	3.892000	0.787E-06	0.000000	112	412
4	1	-0.016	0.017	0.000	2.782359	2.786010	4.920233	4.892000	0.246E+09	0.000000	112	414
5	1	-0.020	0.020	0.000	2.781816	2.773623	5.160278	5.000000	0.236E+09	-0.000382	111	416
6	1	397.850	397.858	397.854	2.787527	2.787523	5.162474	5.160535	0.106E-07	-0.000260	411	111
7	2	181.930	181.988	181.959	2.740000	1.598331	4.230402	4.200000	0.943E-06	0.000817	403	406
8	3	1272.610	1272.664	1272.634	0.808470	0.971503	2.920309	5.774369	0.214E-05	6.316551	401	101
9	3	392.276	392.286	392.281	0.971246	0.971163	5.774369	5.589501	0.137E-05	0.026164	101	402
10	3	880.487	880.511	880.499	0.971246	0.971154	5.774369	5.534806	0.343E-06	0.026164	101	404

IN-SEGMENT DISTRIBUTIONS														
SEG	MODID	NODE	EIN(MJ/KG)	EBAR(MJ/KG)	EOUT(MJ/KG)	WIN(KG/S)	WOUT(KG/S)	TIN(K)	TBAR(K)	TOUT(K)	DENS(KG/M3)	QA(MJ/S)	JIN	JOUT
1	23	1	2.788009	2.788007	2.788004	705.027	705.042	538.682	538.682	538.682	26.226	0.000	1	2
2	22	2	2.786168	2.785947	2.785727	1112.156	1114.562	537.195	537.195	537.195	25.625	0.000	3	4
2	22	3	2.785727	2.785510	2.785294	1114.562	1116.965	537.195	537.195	537.195	25.631	0.000	4	5
2	22	4	2.785294	2.785080	2.784865	1116.965	1119.365	537.195	537.195	537.195	25.638	0.000	5	6
3	601	5	2.783537	2.394539	2.005541	1127.027	1127.027	528.932	528.932	528.932	28.932	-876.821	7	8
4	502	6	2.782359	2.784183	2.786010	-0.016	0.017	535.516	535.516	535.516	24.946	0.000	9	10
5	501	7	2.781816	2.777723	2.773623	-0.020	0.020	537.688	537.688	537.688	25.954	0.000	11	12
6	21	8	2.787527	2.787525	2.787523	397.850	397.858	538.684	538.684	538.684	26.234	0.000	13	14
7	301	9	2.740000	2.169165	1.598331	181.930	181.988	526.270	526.270	526.270	33.173	-207.672	15	16
8	1	10	0.808470	0.808470	0.808470	1272.610	1272.610	462.975	462.975	462.975	876.526	0.000	17	18
8	201	11	0.808470	0.808470	0.808470	1272.610	1272.610	462.975	462.975	462.975	876.526	0.000	18	19
8	2	12	0.808470	0.808463	0.808456	1272.610	1272.614	462.975	462.973	462.972	876.528	0.000	19	20
8	301	13	0.808456	0.890012	0.971568	1272.614	1272.638	462.972	481.166	498.902	856.563	207.663	20	21
8	3	14	0.971568	0.971552	0.971537	1272.638	1272.650	498.902	498.899	498.896	835.373	0.000	21	22
8	3	15	0.971537	0.971520	0.971503	1272.650	1272.664	498.896	498.892	498.889	835.382	0.000	22	23
9	5	16	0.971246	0.971231	0.971216	392.276	392.280	498.793	498.790	498.787	836.757	0.000	24	25
9	5	17	0.971216	0.971203	0.971190	392.280	392.283	498.787	498.784	498.781	836.764	0.000	25	26
9	5	18	0.971190	0.971176	0.971163	392.283	392.286	498.781	498.778	498.775	836.771	0.000	26	27
10	4	19	0.971246	0.971231	0.971216	880.487	880.495	498.794	498.791	498.788	836.730	0.000	28	29
10	4	20	0.971216	0.971201	0.971186	880.495	880.503	498.788	498.784	498.781	836.738	0.000	29	30
10	4	21	0.971186	0.971170	0.971154	880.503	880.511	498.781	498.778	498.774	836.747	0.000	30	31

SYSTEM MODULES

MODULE 1 IS B.C. NUMBER 1, MODID 413,NPATH= 0
 MODULE 2 IS PIPE NUMBER 1, MODID 23,NPATH= 2
 MODULE 3 IS VOL. NUMBER 1, MODID 111,NPATH= 1
 MODULE 4 IS PIPE NUMBER 2, MODID 22,NPATH= 3
 MODULE 5 IS VOL. NUMBER 2, MODID 112,NPATH= 1
 MODULE 6 IS TBSG NUMBER 1, MODID 601,NPATH= 1
 SPEED IN RPM IS 1800.00, EFFICIENCY IS 0.42711, POWER FROM GEN -8.330E+08 J/S
 MODULE 7 IS B.C. NUMBER 2, MODID 412,NPATH= 0
 MODULE 8 IS VALV NUMBER 1, MODID 502,NPATH= 1
 RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.656E-04,AS DETERMINED USING OPTION 1
 MODULE 9 IS B.C. NUMBER 3, MODID 414,NPATH= 0
 MODULE 10 IS VALV NUMBER 2, MODID 501,NPATH= 1
 RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.690E-04,AS DETERMINED USING OPTION 1
 MODULE 11 IS B.C. NUMBER 4, MODID 416,NPATH= 0
 MODULE 12 IS B.C. NUMBER 5, MODID 411,NPATH= 0
 MODULE 13 IS PIPE NUMBER 3, MODID 21,NPATH= 1
 MODULE 14 IS B.C. NUMBER 6, MODID 403,NPATH= 0
 MODULE 15 IS H.X. NUMBER 1, MODID 301,NPATH= 1

THE HEAT FLUX AREA CORRECTION FACTOR IS 0.782411

T	NOD I	NOD O	NOD	QINR(KJ/S/M)	TINR(K)	T TUBE(K)	TOUTR(K)	QOUTR(KJ/S/M)	MODE,I	MODE,O	T,CORE	T,STRC
1	13	9		9.97534	481.16601	493.29579	526.27034	-9.97576	1	6	481.2	526.3
MODULE 16	IS	B.C. NUMBER	7,	MODID 406,	NPATH=	0						
MODULE 17	IS	B.C. NUMBER	8,	MODID 401,	NPATH=	0						
MODULE 18	IS	PIPE NUMBER	4,	MODID 1,	NPATH=	1						
MODULE 19	IS	PUMP NUMBER	1,	MODID 201,	NPATH=	2						
PUMP SPEED= 3570.000 PUMP FLOW= 636.305 KG/S PUMP HEAD= 532.746 METERS												
MODULE 20	IS	PIPE NUMBER	5,	MODID 2,	NPATH=	1						
MODULE 21	IS	PIPE NUMBER	6,	MODID 3,	NPATH=	1						
MODULE 22	IS	VOL. NUMBER	3,	MODID 101,	NPATH=	1						
MODULE 23	IS	PIPE NUMBER	7,	MODID 5,	NPATH=	1						
MODULE 24	IS	B.C. NUMBER	9,	MODID 402,	NPATH=	0						
MODULE 25	IS	PIPE NUMBER	8,	MODID 4,	NPATH=	2						
MODULE 26	IS	B.C. NUMBER	10,	MODID 404,	NPATH=	0						

STANDARD TIME STEP NUMBER = 25 ACTUAL TIME STEP NUMBER = 620 TIME = 2.500000E+01 SECONDS

NORMALIZED CORE POWER	CORE POWER (MW)	THERMAL POWER (BTU/HR)	HEAT REMOV. RATE (BTU/HR)	ENERGY BALANCE (BTU)	WATER MASS BALANCE (LBM)	AIR MASS BALANCE (LBM)
3.490219E-02	8.027504E+01	2.905152E+08	0.000000E+00	3.867414E+08	8.707697E+05	3.306896E+03

VOLUME NUMBER	AVG. PRES. (PSIA)	TOT. MASS (LB)	AVG. ENTH. (BTU/LB)	AVG. DEN. (LB/FT3)	AVG. TEMP. (DEG. F)	AVG. QUAL.	BUBB. MASS (LB)	MIX. LEV. (FT)	LIQ. MASS (LB)
1	1.59342E+03	4.32250E+04	5.61558E+02	4.57891E+01	5.60008E+02	0.00000E+00	0.00000E+00	1.16700E+01	4.32250E+04
2	1.58022E+03	8.72940E+03	5.62866E+02	4.57037E+01	5.60979E+02	0.00000E+00	0.00000E+00	3.59000E+00	8.72940E+03
3	1.58052E+03	1.22389E+04	5.65509E+02	4.55487E+01	5.62991E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.22389E+04
4	1.57553E+03	1.03866E+04	5.54134E+02	4.62038E+01	5.54261E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.03866E+04
5	1.57012E+03	1.05153E+04	5.43824E+02	4.67763E+01	5.46202E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.05153E+04
7	1.56386E+03	2.13201E+04	5.31801E+02	4.74202E+01	5.36641E+02	0.00000E+00	0.00000E+00	9.40500E+00	2.13201E+04
8	1.56413E+03	1.07129E+04	5.27323E+02	4.76552E+01	5.33039E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.07129E+04
9	1.56566E+03	1.07442E+04	5.24648E+02	4.77947E+01	5.30878E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.07442E+04
10	1.56785E+03	1.28103E+04	5.26980E+02	4.76751E+01	5.32768E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.28103E+04
11	1.56428E+03	1.24235E+04	5.29085E+02	4.75633E+01	5.34459E+02	0.00000E+00	0.00000E+00	1.20500E+01	1.24235E+04
12	1.58986E+03	1.82131E+04	5.31906E+02	4.74299E+01	5.36767E+02	0.00000E+00	0.00000E+00	5.19000E+00	1.82131E+04
13	1.60824E+03	7.65771E+03	5.32925E+02	4.73868E+01	5.37614E+02	0.00000E+00	0.00000E+00	2.29000E+00	7.65771E+03
14	1.60372E+03	8.70744E+03	5.34078E+02	4.73231E+01	5.38529E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.70744E+03
15	1.60498E+03	8.69728E+03	5.35131E+02	4.72678E+01	5.39373E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69728E+03
16	1.60773E+03	8.68818E+03	5.36089E+02	4.72184E+01	5.40141E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.68818E+03
17	1.60787E+03	3.42662E+04	5.38873E+02	4.70690E+01	5.42356E+02	0.00000E+00	0.00000E+00	9.79000E+00	3.42662E+04
18	1.60379E+03	7.74360E+03	5.45003E+02	4.67326E+01	5.47191E+02	0.00000E+00	0.00000E+00	4.02000E+00	7.74360E+03
19	1.60085E+03	7.67953E+03	5.51914E+02	4.63460E+01	5.52589E+02	0.00000E+00	0.00000E+00	4.00000E+00	7.67953E+03
20	1.59789E+03	7.62047E+03	5.58145E+02	4.59895E+01	5.57401E+02	0.00000E+00	0.00000E+00	4.10000E+00	7.62047E+03
21	1.60396E+03	1.99692E+03	5.40357E+02	4.69864E+01	5.43526E+02	0.00000E+00	0.00000E+00	1.21000E+01	1.99692E+03
22	1.59092E+03	2.41308E+04	5.40262E+02	4.69836E+01	5.43428E+02	0.00000E+00	0.00000E+00	7.67000E+00	2.41308E+04
23	1.57794E+03	4.29324E+03	5.75368E+02	4.49554E+01	5.70403E+02	0.00000E+00	0.00000E+00	3.59000E+00	4.29324E+03
24	1.58078E+03	6.02063E+03	5.78001E+02	4.47963E+01	5.72369E+02	0.00000E+00	0.00000E+00	5.91000E+00	6.02063E+03
25	1.57581E+03	5.12812E+03	5.64174E+02	4.56239E+01	5.61967E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.12812E+03
26	1.57042E+03	5.20867E+03	5.51659E+02	4.63405E+01	5.52331E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.20867E+03
28	1.56418E+03	1.05968E+04	5.37081E+02	4.71390E+01	5.40858E+02	0.00000E+00	0.00000E+00	9.40500E+00	1.05968E+04
29	1.56443E+03	5.33090E+03	5.31660E+02	4.74279E+01	5.36529E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.33090E+03
30	1.56594E+03	5.35028E+03	5.28394E+02	4.76004E+01	5.33905E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.35028E+03
31	1.56812E+03	6.38101E+03	5.30757E+02	4.74777E+01	5.35810E+02	0.00000E+00	0.00000E+00	5.91000E+00	6.38101E+03
32	1.56454E+03	6.18575E+03	5.32869E+02	4.73641E+01	5.37497E+02	0.00000E+00	0.00000E+00	1.20500E+01	6.18575E+03
33	1.59003E+03	9.06866E+03	5.35624E+02	4.72326E+01	5.39741E+02	0.00000E+00	0.00000E+00	5.19000E+00	9.06866E+03
34	1.60833E+03	3.81306E+03	5.36601E+02	4.71913E+01	5.40550E+02	0.00000E+00	0.00000E+00	2.29000E+00	3.81306E+03
35	1.60381E+03	4.33140E+03	5.37664E+02	4.71316E+01	5.41389E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.33140E+03
36	1.60505E+03	4.32682E+03	5.38603E+02	4.70819E+01	5.42137E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.32682E+03
37	1.60780E+03	4.32290E+03	5.39426E+02	4.70391E+01	5.42795E+02	0.00000E+00	0.00000E+00	8.62000E+00	4.32290E+03
39	LIQ REG VAP REG	1.62623E+03	2.70799E+03	6.29963E+02	3.97642E+01	6.07416E+02	4.69124E-03	1.27038E+01	1.90684E+00
			5.07047E+03	1.13847E+03	4.11598E+00	6.07416E+02	9.54121E-01	4.83784E+03	1.90684E+00
40		1.58141E+03	1.23837E+03	6.32261E+02	3.51809E+01	6.03547E+02	1.90735E-02	2.36200E+01	9.23000E+00
101		7.85339E+02	1.00386E+05	5.39757E+02	2.12278E+01	5.15654E+02	4.69360E-02	2.28309E+03	3.75065E+01
131		7.77275E+02	2.31030E+02	1.19929E+02	1.69875E+00	5.14474E+02	9.98960E-01	2.30789E+02	3.24200E+01
132		7.61643E+02	7.60300E+02	1.19848E+03	1.66550E+00	5.12162E+02	9.97220E-01	7.58186E+02	1.36300E+01
201		7.77541E+02	2.04304E+05	5.37133E+02	2.16011E+01	5.14513E+02	4.50399E-02	3.86841E+03	3.57491E+01
231		7.70941E+02	4.58037E+02	1.19953E+03	1.68396E+00	5.13542E+02	9.99060E-01	4.57606E+02	3.24200E+01
232		7.58780E+02	1.44298E+03	1.19868E+03	1.65860E+00	5.11734E+02	9.97408E-01	1.43924E+03	1.36300E+01
500		6.14682E+02	1.11384E+05	4.80058E+01	4.51859E+01	8.00000E+01	1.01518E-05	0.00000E+00	1.23900E+01
501		6.14682E+02	5.56918E+04	4.80058E+01	4.51859E+01	8.00000E+01	1.01518E-05	0.00000E+00	1.23900E+01

701	7.91267E+02	6.07690E+03	4.17968E+02	5.22071E+01	4.38814E+02	0.00000E+00	0.00000E+00	2.00000E+00	6.07690E+03
801	7.83662E+02	1.21523E+04	4.18049E+02	5.22007E+01	4.38889E+02	0.00000E+00	0.00000E+00	2.00000E+00	1.21523E+04
900	1.47000E+01	6.44163E+04	1.18996E+03	3.30340E-02	3.00000E+02	1.00000E+00	6.44163E+04	0.00000E+00	0.00000E+00
901	7.48754E+02	1.65959E+00	1.19842E+03	1.63668E+00	5.10228E+02	9.96982E-01	1.65409E+00	1.36300E+01	5.49683E-03
902	7.48702E+02	3.31799E+00	1.19863E+03	1.63609E+00	5.10220E+02	9.96982E-01	3.30798E+00	1.36300E+01	1.00134E-02

JUNCTION NUMBER	CONNECTS VOLUMES	CHOKE MODE	JUN. FLOW (LB/SEC)	JUN. ENTH. (BTU/LB)	JUN. SPVL. (FT3/LB)	P R E S S U R E				D I F F E R E N T I A L S PUMP PSI
						STAG. PSI	ELEV. PSI	FRIC. PSI	ACCL. PSI	
1	1 TO 2		1.44546E+04	5.61637E+02	2.18408E-02	7.65304E+00	1.43424E-01	-8.05743E+00	-2.60963E-01	0.00000E+00
2	2 TO 3		1.44350E+04	5.62966E+02	2.18825E-02	5.53657E+00	-1.00053E+00	-4.72726E+00	-1.91223E-01	0.00000E+00
3	3 TO 4		1.44060E+04	5.65605E+02	2.19571E-02	4.03657E+00	-2.62532E+00	-1.47360E+00	-6.23476E-02	0.00000E+00
4	4 TO 5		1.43796E+04	5.54242E+02	2.16465E-02	5.46125E+00	-3.40240E+00	-2.15425E+00	-9.54030E-02	0.00000E+00
5	5 TO 7		1.43525E+04	5.43938E+02	2.13816E-02	6.32904E+00	-3.23894E+00	-3.22707E+00	-1.36970E-01	0.00000E+00
7	7 TO 8		1.43017E+04	5.31925E+02	2.10907E-02	-2.26270E-01	3.27093E+00	-3.18084E+00	-1.36187E-01	0.00000E+00
8	8 TO 9		1.42776E+04	5.27443E+02	2.09863E-02	-1.50028E+00	3.49284E+00	-2.08242E+00	-8.98665E-02	0.00000E+00
9	9 TO 10		1.42547E+04	5.24764E+02	2.09249E-02	-1.25097E+00	2.72721E+00	-1.52230E+00	-4.60697E-02	0.00000E+00
10	10 TO 11		1.42268E+04	5.27077E+02	2.09770E-02	-5.18891E-01	2.49518E+00	-2.21824E+00	-2.41956E-01	0.00000E+00
11	11 TO 12		1.42007E+04	5.29190E+02	2.10267E-02	-2.28430E+01	-7.77037E-01	-1.15417E+00	-5.23601E-01	2.42506E+01
12	12 TO 13		1.41666E+04	5.31979E+02	2.10852E-02	-2.40853E+01	-4.74258E-01	-2.50299E-01	-5.59257E-01	2.42506E+01
13	13 TO 14		1.41534E+04	5.33017E+02	2.11047E-02	9.41257E+00	-5.42205E-01	-9.10084E+00	-2.30473E-01	0.00000E+00
14	14 TO 15		1.41146E+04	5.34170E+02	-1.21741E-02	-1.21741E+00	2.83424E+00	-1.71625E+00	-9.94206E-02	0.00000E+00
15	15 TO 16		1.41022E+04	5.35216E+02	2.11573E-02	-2.74579E+00	2.82784E+00	-1.82218E-01	-1.00168E-01	0.00000E+00
16	16 TO 17		1.40910E+04	5.36167E+02	2.11793E-02	1.50852E+00	1.96884E+00	-3.54980E+00	-7.24338E-02	0.00000E+00
17	17 TO 18		2.03700E+04	5.38919E+02	2.12465E-02	3.72981E+00	-2.25223E+00	-1.52820E+00	-5.06132E-02	0.00000E+00
18	18 TO 19		2.03607E+04	5.45067E+02	2.13998E-02	2.94820E+00	-1.29592E+00	-1.68157E+00	-2.92892E-02	0.00000E+00
19	19 TO 20		2.03477E+04	5.51997E+02	2.15788E-02	2.95928E+00	-1.29829E+00	-1.69112E+00	-3.01303E-02	0.00000E+00
20	20 TO 1		2.03311E+04	5.58244E+02	2.17466E-02	4.88551E+00	-2.44614E+00	-2.46511E+00	-2.57415E-02	0.00000E+00
21	21 TO 1		7.26708E+02	5.40379E+02	2.12835E-02	1.03564E+01	-3.77138E+00	-6.62808E+00	-4.30164E-02	0.00000E+00
22	22 TO 1		4.42641E+01	5.40273E+02	2.12836E-02	-2.81180E+00	2.81042E+00	-5.32305E-03	-6.70643E-03	0.00000E+00
23	23 TO 24		7.21596E+03	5.75485E+02	2.22474E-02	5.60341E+00	-9.84035E-01	-4.80403E+00	-1.84662E-01	0.00000E+00
24	24 TO 25		7.19942E+03	5.78107E+02	2.23263E-02	4.02011E+00	-2.58862E+00	-1.49365E+00	-6.21579E-02	0.00000E+00
25	25 TO 26		7.18465E+03	5.64291E+02	2.19221E-02	5.44411E+00	-3.36518E+00	-2.17373E+00	-9.47988E-02	0.00000E+00
26	26 TO 28		7.16957E+03	5.51782E+02	2.15830E-02	6.32466E+00	-3.21393E+00	-3.24621E+00	-1.35479E-01	0.00000E+00
28	28 TO 29		7.14185E+03	5.37212E+02	2.12168E-02	-2.03716E-01	3.25351E+00	-3.18447E+00	-1.34669E-01	0.00000E+00
29	29 TO 30		7.12882E+03	5.31787E+02	2.10870E-02	-1.48332E+00	3.47738E+00	-2.08280E+00	-8.87393E-02	0.00000E+00
30	30 TO 31		7.11646E+03	5.28516E+02	2.10105E-02	-1.23893E+00	2.71602E+00	-1.52232E+00	-4.52240E-02	0.00000E+00
31	31 TO 32		7.10168E+03	5.30858E+02	2.10643E-02	-5.03976E-01	2.48475E+00	-2.22004E+00	-2.39273E-01	0.00000E+00
32	32 TO 33		7.08813E+03	5.32977E+02	2.11153E-02	-2.27592E+01	-7.73808E-01	-1.15500E+00	-5.19325E-01	2.41687E+01
33	33 TO 34		7.07120E+03	5.35696E+02	2.11733E-02	-2.40015E+01	-4.72286E-01	-2.50481E-01	-5.55584E-01	2.41687E+01
34	34 TO 35		7.06485E+03	5.36690E+02	2.11921E-02	9.41847E+00	-5.40014E-01	-9.10761E+00	-2.29151E-01	0.00000E+00
35	35 TO 36		7.04592E+03	5.37750E+02	2.12184E-02	-1.20449E+00	2.82295E+00	-1.71738E+00	-9.89189E-02	0.00000E+00
36	36 TO 37		7.04034E+03	5.38681E+02	2.12407E-02	-2.73627E+00	2.81857E+00	-1.82125E-01	-9.98255E-02	0.00000E+00
37	37 TO 17		7.03559E+03	5.39495E+02	2.12598E-02	1.51016E+00	1.96185E+00	-3.54511E+00	-7.31008E-02	0.00000E+00
39	39 TO 40		1.41793E+03	6.28388E+02	2.43359E-02	2.57368E+01	2.07845E+00	-2.78939E+01	-7.86683E-02	0.00000E+00
40	40 TO 23		1.40109E+03	6.32508E+02	2.86565E-02	3.62961E+00	9.44164E-01	-5.13313E+00	-5.59356E-01	0.00000E+00
42	17 TO 21		7.27356E+02	5.38921E+02	2.12465E-02	4.20374E+00	-3.57401E+00	-6.78174E-01	-4.84426E-02	0.00000E+00
43	1 TO 23		6.55303E+03	5.61641E+02	2.18409E-02	6.23199E+00	1.46468E-01	-6.62669E+00	-2.48234E-01	0.00000E+00
44	35 TO 22		1.25025E+01	5.37710E+02	2.12182E-02	1.68380E+01	-2.66349E+00	-1.42024E+01	-2.79279E-02	0.00000E+00
45	14 TO 22		2.50187E+01	5.34130E+02	2.11325E-02	1.67501E+01	-2.66922E+00	-1.41081E+01	-2.72124E-02	0.00000E+00
75	23 TO 900	EXT-HEN	7.26483E+02	5.73344E+02	2.21829E-02	1.57917E+03	1.63957E-01	1.57946E+03	-2.75665E-03	0.00000E+00
100	701 TO 101		2.63074E-01	4.17971E+02	1.91544E-02	5.93008E+00	-5.92885E+00	-3.90045E-07	1.22357E-03	0.00000E+00
101	101 TO 131		8.64578E+02	1.19979E+03	5.83786E-01	3.27220E+00	-1.49143E+00	-1.82422E+00	-4.34538E-02	0.00000E+00
131	131 TO 132		8.67032E+02	1.19715E+03	5.86722E-01	1.53516E+01	2.70183E-01	-1.57868E+01	-1.65030E-01	0.00000E+00
200	801 TO 201		5.03685E-01	4.18052E+02	1.91567E-02	6.12134E+00	-6.12130E+00	-3.60674E-07	3.33966E-04	0.00000E+00
201	201 TO 231		1.52561E+03	1.20000E+03	5.89963E-01	2.84282E+00	-1.43870E+00	-1.44026E+00	-3.61377E-02	0.00000E+00
231	231 TO 232		1.53033E+03	1.19783E+03	5.92206E-01	1.19671E+01	2.68187E-01	-1.23943E+01	-1.58998E-01	0.00000E+00
500	500 TO 13		0.00000E+00	5.33044E+02	2.11052E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00
501	501 TO 34		0.00000E+00	5.36717E+02	2.11926E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00
901	132 TO 901		8.74693E+02	1.19845E+03	6.00920E-01	1.27111E+01	1.36409E-03	-1.24846E+01	2.27820E-01	0.00000E+00
902	232 TO 902		1.54466E+03	1.19866E+03	6.03225E-01	1.00356E+01	1.06463E-03	-9.78822E+00	2.48418E-01	0.00000E+00

800	0 TO 801	0.00000E+00	4.18052E+02	1.91567E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
700	0 TO 701	0.00000E+00	4.17971E+02	1.91544E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
601	0 TO 36	0.00000E+00	5.38683E+02	2.12411E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
600	0 TO 15	0.00000E+00	5.35218E+02	2.11577E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
290	0 TO 201	0.00000E+00	5.07827E+02	2.13233E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
254	0 TO 232	0.00000E+00	1.19911E+03	6.02936E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
253	0 TO 232	0.00000E+00	1.19911E+03	6.02936E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
252	0 TO 232	0.00000E+00	1.19911E+03	6.02936E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
251	0 TO 232	0.00000E+00	1.19911E+03	6.02936E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
235	0 TO 232	0.00000E+00	1.19911E+03	6.02936E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
234	0 TO 232	0.00000E+00	1.19911E+03	6.02936E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
232	0 TO 232	0.00000E+00	1.19911E+03	6.02936E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
190	0 TO 101	0.00000E+00	5.09465E+02	2.15820E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
154	0 TO 132	0.00000E+00	1.19903E+03	6.00531E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
153	0 TO 132	0.00000E+00	1.19903E+03	6.00531E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
152	0 TO 132	0.00000E+00	1.19903E+03	6.00531E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
151	0 TO 132	0.00000E+00	1.19903E+03	6.00531E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
135	0 TO 132	0.00000E+00	1.19903E+03	6.00531E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
134	0 TO 132	0.00000E+00	1.19903E+03	6.00531E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
132	0 TO 132	0.00000E+00	1.19903E+03	6.00531E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
95	0 TO 34	0.00000E+00	5.36715E+02	2.11927E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
94	0 TO 13	0.00000E+00	5.33042E+02	2.11053E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
92	0 TO 13	0.00000E+00	5.33044E+02	2.11053E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

VOLUME NUMBER	SLIP VEL. (FT/SEC)	VOID FRACTION	LIQUID FLOW (LB/SEC)	GAS FLOW (LB/SEC)	VOL. FLOW (LB/SEC)	GAS VEL. (FT/SEC)	LIQ. VEL. (FT/SEC)	VG/VL	FLOW REGIME
40	-4.53533E-01	1.76229E-01	1.38234E+03	2.71687E+01	1.40951E+03	6.72191E+01	6.67656E+01	1.00679E+00	2

JUNCTION NUMBER	SLIP VEL. (FT/SEC)	VOID FRACTION	LIQUID FLOW (LB/SEC)	GAS FLOW (LB/SEC)	SLIP CNVCTN (BTU/SEC)	GAS VEL. (FT/SEC)	LIQ. VEL. (FT/SEC)	VG/VL	FLOW REGIME
40	-9.07065E-01	1.84064E-01	1.37553E+03	2.85198E+01	2.03019E+02	6.79476E+01	6.70405E+01	1.01353E+00	2

PUMP NUMBER	VOLUME NUMBER	PUMP SPEED (RPM)	NORM. PUMP TORQUE	NORM. FRIC. TORQUE	NORM. MOT. TORQUE	POWER TO H2O (BTU/HR)
1	33	8.79186E+02	5.40830E-01	1.00000E+00	0.00000E+00	5.50669E+06
2	12	8.78164E+02	5.42265E-01	1.00000E+00	0.00000E+00	1.10298E+07

HEAT COND. NUMBER	VOL. NUM.	H.T. MODE	SURF. FLUX (BTU/HR-FT2)	CRIT. FLUX (BTU/HR-FT2)	H.T. COEF. (BTU/H-F2-F)	SURF. TEMP. (DEG. F)	MASS FLUX (LBM/HR-FT2)	STORD ENRGY (BTU)	POWR TO H2O (BTU/HR)
1	RIGHT 18	1	2.92306E+04	1.53326E+06	4.50636E+03	5.53733E+02	1.77554E+06	3.38689E+06	4.15724E+08
2	RIGHT 19	1	3.25124E+04	1.52155E+06	4.52399E+03	5.59845E+02	1.77453E+06	3.49194E+06	4.62399E+08
3	RIGHT 20	1	2.83411E+04	1.51116E+06	4.53899E+03	5.63726E+02	1.77319E+06	3.41802E+06	4.03073E+08
16	RIGHT 2	1	2.08521E+04	1.50673E+06	5.11735E+03	5.65135E+02	5.68245E+06	2.55940E+06	6.17223E+06
17	RIGHT 3	1	1.63706E+04	1.50203E+06	7.93286E+02	5.83710E+02	6.92161E+05	8.10707E+06	4.47999E+07
18	RIGHT 10	1	6.34589E+03	1.57473E+06	7.66435E+02	5.41138E+02	6.83317E+05	7.34328E+06	1.73662E+07
19	RIGHT 11	1	3.04582E+04	1.57160E+06	4.39134E+03	5.41482E+02	4.89668E+06	3.60034E+06	1.33407E+07
20	RIGHT 12	1	1.81501E+04	1.56042E+06	2.54538E+03	5.43978E+02	2.66723E+06	1.74954E+07	6.41425E+06
21	RIGHT 13	1	1.22585E+04	1.55402E+06	5.44713E+03	5.39941E+02	6.20476E+06	1.91112E+06	3.13818E+06
22	RIGHT 14	1	2.12884E+04	1.55305E+06	4.13910E+03	5.43744E+02	3.30826E+06	7.15275E+06	5.16031E+06
23	RIGHT 15	1	1.90091E+04	1.55084E+06	4.13296E+03	5.44038E+02	3.29941E+06	7.15355E+06	4.60780E+06
24	RIGHT 16	1	1.69033E+04	1.54842E+06	4.13270E+03	5.44292E+02	3.29672E+06	7.15431E+06	4.09737E+06
25	RIGHT 17	1	4.90949E+03	1.54337E+06	1.65099E+03	5.45376E+02	1.02524E+06	4.36356E+06	1.36337E+06
26	RIGHT 23	1	2.01921E+04	1.48539E+06	5.56729E+03	5.74119E+02	6.25249E+06	1.28392E+06	2.98843E+06
27	RIGHT 24	1	1.36606E+04	1.48030E+06	7.99256E+02	5.89548E+02	6.91918E+05	4.07527E+06	1.86918E+07
28	RIGHT 31	1	5.35690E+03	1.56760E+06	7.67296E+02	5.42885E+02	6.82216E+05	3.67734E+06	7.32984E+06
29	RIGHT 32	1	2.65205E+04	1.56448E+06	4.39593E+03	5.43618E+02	4.88833E+06	1.80146E+06	5.80798E+06
30	RIGHT 33	1	1.42880E+04	1.55354E+06	2.54787E+03	5.45428E+02	2.66262E+06	8.75192E+06	2.52469E+06
31	RIGHT 34	1	1.08630E+04	1.54729E+06	5.45242E+03	5.42617E+02	6.19421E+06	9.56505E+05	1.39047E+06
32	RIGHT 35	1	1.62369E+04	1.54650E+06	4.14303E+03	5.45375E+02	3.30280E+06	3.57834E+06	1.96791E+06
33	RIGHT 36	1	1.39279E+04	1.54451E+06	4.13684E+03	5.45564E+02	3.29423E+06	3.57861E+06	1.68806E+06

34	RIGHT	37	1	1.18602E+04	1.54236E+06	4.13657E+03	5.45716E+02	3.29190E+06	3.57887E+06	1.43746E+06
35	RIGHT	22	1	3.34231E+01	1.54500E+06	9.94575E+00	5.46797E+02	2.47614E+03	9.74425E+06	8.12851E+03
4	LEFT	4	1	-5.70566E+04	1.52322E+06	5.33431E+03	5.43657E+02	2.43566E+06		-6.74551E+08
	RIGHT	201	11	5.25095E+04	1.52038E+06	6.82306E+03	5.22263E+02	1.55661E+04	1.67250E+06	7.00875E+08
5	LEFT	5	1	-4.35282E+04	1.54303E+06	5.29196E+03	5.38075E+02	2.43096E+06		-6.24582E+08
	RIGHT	201	11	4.05278E+04	1.52038E+06	5.74103E+03	5.21627E+02	1.55661E+04	2.01857E+06	6.56547E+08
6	LEFT	7	1	-2.79271E+04	1.56658E+06	5.24027E+03	5.31408E+02	2.42413E+06		-4.00672E+08
	RIGHT	201	11	2.66193E+04	1.52038E+06	4.33795E+03	5.20704E+02	1.55661E+04	1.98780E+06	4.31174E+08
9	LEFT	9	1	-1.88579E+04	1.57960E+06	5.19802E+03	5.27341E+02	2.41352E+06		-2.22948E+08
	RIGHT	201	11	1.84735E+04	1.52038E+06	3.40033E+03	5.20000E+02	1.55661E+04	1.64170E+06	2.46578E+08
8	LEFT	8	1	-2.22155E+04	1.57491E+06	5.21403E+03	5.28871E+02	2.41760E+06		-3.18768E+08
	RIGHT	201	11	2.15002E+04	1.52038E+06	3.76226E+03	5.20282E+02	1.55661E+04	1.99733E+06	3.48301E+08
7	LEFT	7	1	-2.79271E+04	1.56658E+06	5.24027E+03	5.31408E+02	2.42413E+06		-4.00672E+08
	RIGHT	201	11	2.66193E+04	1.52038E+06	4.33795E+03	5.20704E+02	1.55661E+04	1.98780E+06	4.31174E+08
10	LEFT	25	1	-6.82579E+04	1.50532E+06	5.36518E+03	5.49341E+02	2.43419E+06		-4.03579E+08
	RIGHT	101	11	6.25541E+04	1.52161E+06	7.68809E+03	5.23846E+02	1.76431E+04	8.42339E+05	4.17566E+08
11	LEFT	26	1	-5.18644E+04	1.52873E+06	5.31449E+03	5.42676E+02	2.42895E+06		-3.72181E+08
	RIGHT	101	11	4.80302E+04	1.52161E+06	6.44650E+03	5.23160E+02	1.76431E+04	1.01553E+06	3.89129E+08
12	LEFT	28	1	-3.28882E+04	1.55670E+06	5.25320E+03	5.34699E+02	2.42145E+06		-2.35976E+08
	RIGHT	101	11	3.11167E+04	1.52161E+06	4.82662E+03	5.22156E+02	1.76431E+04	9.98704E+05	2.52067E+08
15	LEFT	30	1	-2.17921E+04	1.57250E+06	5.20431E+03	5.29813E+02	2.40993E+06		-1.28847E+08
	RIGHT	101	11	2.11584E+04	1.52161E+06	3.73225E+03	5.21378E+02	1.76431E+04	8.24095E+05	1.41239E+08
14	LEFT	29	1	-2.59264E+04	1.56672E+06	5.22284E+03	5.31663E+02	2.41433E+06		-1.86049E+08
	RIGHT	101	11	2.48816E+04	1.52161E+06	4.15815E+03	5.21693E+02	1.76431E+04	1.00296E+06	2.01584E+08
13	LEFT	28	1	-3.28882E+04	1.55670E+06	5.25320E+03	5.34699E+02	2.42145E+06		-2.35976E+08
	RIGHT	101	11	3.11167E+04	1.52161E+06	4.82662E+03	5.22156E+02	1.76431E+04	9.98704E+05	2.52067E+08

CORE SECT. NUMBER	HEAT COND. NUMBER	DEPTH REAC. EXT. ZR-H2O (FT)	DEPTH REAC. INT. ZR-H2O (FT)	HEAT GEN. ZR-H2O (BTU/HR)	COND. HEAT- ING RATE (BTU/HR)	DIR. MODER- ATOR HT RT (BTU/HR)	AVG. METAL TEMPERATURE (DEG. F)	CENTERLINE TEMPERATURE (DEG. F)
1	1	0.00000E+00	0.00000E+00	0.00000E+00	9.16568E+07	0.00000E+00	6.92796E+02	7.50158E+02
2	2	0.00000E+00	0.00000E+00	0.00000E+00	9.77967E+07	0.00000E+00	7.14718E+02	7.79813E+02
3	3	0.00000E+00	0.00000E+00	0.00000E+00	8.45252E+07	0.00000E+00	6.97363E+02	7.52544E+02

CONTEXT SAVE AT 25.00000 SECONDS STEP NO. 620

WRITTEN TO UNIT NUMBER 34

DATA RECORD NUMBER 26 WAS WRITTEN ON TAPE VSN = , DENSITY = PE, CREATED ON 90159
AND WAS LABELED RETRAN1

TIMING EDIT ACCUMULATED TIME = 59.896 SECONDS

SUBROUTINE	CPU TIME (SEC)	PERCENT	NUMBER OF CALLS
* STSTAT	2.604	4.35	1
* TRAN	57.292	95.65	1
* TSTP	2.604	4.35	620
* ADVFLO	10.417	17.39	631
DIRSOL	13.021	21.74	3720
* CONTRL	18.229	30.43	29774
* PRESUR	10.417	17.39	621
STATEW	10.417	17.39	28566
* ENERGY	15.625	26.09	2498
* JUNPRP	7.813	13.04	633

* INDICATES OUTER LOOP TIME

TIME STEP CONTROL SUMMARY FOR 13 ACTUAL TIME STEPS. THE AVERAGE TIME STEP SIZE FOR THE INTERVAL WAS 7.692308E-02 SECONDS.

NUMBER OF TIMES EACH TEST CONTROLLED TIME STEP SIZE

UPPER LIMIT	LOWER LIMIT	PRESSURE CHANGE	MASS CHANGE	ENERGY CHANGE	COURANT LIMIT	SAT LINE CROSSING	AIR MASS CHANGE	ZERO FLOW CROSSING	TRIP ACTUATION
0	0	0	0	0	12	0	0	0	1

VOLUMES CONTROLLING COURANT LIMIT
 (VOLUME INDEX ; TIMES CONTROLLING)

131; 12

TRIP ID(S) CONTROLLING TIME STEP
 (TRIP ID ; TIMES CONTROLLING)

1; 1

MINET, TIME= 25.08005 TIME STEP=0.08005 STEP NO. 621
 MINIMUM TIME CONSTANT= 5.235E-01 SEC, LIMIT KEY= 101

SYSTEM BOUNDARY CONDITIONS:

ID	NETWORK	FLOW(KG/S)	ENTHALPY(MJ/KG)	PRESSURE(MPA)	TEMP(K)	FLUID
413	1	704.355	2.788031	5.158526	538.648	H2O
412	1	1124.371	2.005210	3.892000	521.547	H2O
414	1	0.016	2.785947	4.892000	535.337	H2O
416	1	0.018	2.773554	5.000000	536.694	H2O
411	1	397.443	2.787551	5.158879	538.652	H2O
403	2	181.930	2.740000	4.230402	526.486	H2O
406	2	181.988	1.598339	4.200000	526.054	H2O
401	3	1272.610	0.808470	2.920322	463.146	H2O
402	3	392.288	0.971163	5.589516	498.778	H2O
404	3	880.509	0.971155	5.534826	498.778	H2O

SYSTEM VOLUMES

ID	PRESSURE(MPA)	ENTHALPY(MJ/KG)	TEMP(K)	LEVEL(RELATIVE)	HEAT INPUT(MJ/S)	NETWORK	REGIONS
111	5.156811	2.786200	538.627	0.000000	0.000000	1	1
112	4.916943	2.783550	535.652	0.000000	0.000000	1	1
101	5.774387	0.971247	498.791	0.000000	0.000000	3	1

SYSTEM SEGMENTS

SEG	NETWK	WIN(KG/S)	WOUT(KG/S)	WBAR(KG/S)	ALPHA IS IN MPA*SEC*SEC/KG/KG		PIN(MPA)	POUT(MPA)	ALPHA, SEG	BETA(MPA)	CONNECTS TO:	
					EIN(MJ/KG)	EOUT(MJ/KG)					IN	OUT
1	1	704.355	704.368	704.361	2.788031	2.788026	5.158526	5.156939	0.268E-08	-0.000260	413	111
2	1	1110.277	1117.012	1113.645	2.786184	2.784883	5.156811	4.916943	0.194E-06	-0.000497	111	112
3	1	1124.371	1124.371	1124.371	2.783543	2.005210	4.916943	3.892000	0.787E-06	0.000000	112	412
4	1	-0.016	0.016	0.000	2.782295	2.785947	4.917066	4.892000	0.272E+09	0.000000	112	414
5	1	-0.018	0.018	0.000	2.781747	2.773554	5.156682	5.000000	0.237E+09	-0.000382	111	416
6	1	397.443	397.450	397.447	2.787551	2.787547	5.158879	5.156939	0.106E-07	-0.000260	411	111
7	2	181.930	181.988	181.959	2.740000	1.598339	4.230402	4.200000	0.943E-06	0.000817	403	406
8	3	1272.610	1272.662	1272.633	0.808470	0.971506	2.920322	5.774387	0.214E-05	6.316551	401	101
9	3	392.279	392.288	392.284	0.971246	0.971163	5.774387	5.589516	0.137E-05	0.026164	101	402
10	3	880.484	880.509	880.496	0.971246	0.971155	5.774387	5.534826	0.343E-06	0.026164	101	404

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IN-SEGMENT DISTRIBUTIONS														
SEG	MODID	NODE	EIN(MJ/KG)	EBAR(MJ/KG)	EOUT(MJ/KG)	WIN(KG/S)	WOUT(KG/S)	TIN(K)	TBAR(K)	TOUT(K)	DENS(KG/M3)	QA(MJ/S)	JIN	JOUT
1	23	1	2.788031	2.788029	2.788026	704.355	704.368	538.638	538.638	538.638	26.213	0.000	1	2
2	22	2	2.786184	2.785965	2.785746	1110.277	1112.523	537.153	537.153	537.153	25.613	0.000	3	4
2	22	3	2.785746	2.785529	2.785312	1112.523	1114.768	537.153	537.153	537.153	25.620	0.000	4	5
2	22	4	2.785312	2.785097	2.784883	1114.768	1117.012	537.153	537.153	537.153	25.627	0.000	5	6
3	601	5	2.783543	2.394376	2.005210	1124.371	1124.371	528.911	528.911	528.911	28.910	-875.137	7	8
4	502	6	2.782295	2.784119	2.785947	-0.016	0.016	535.496	535.496	535.496	24.941	0.000	9	10
5	501	7	2.781747	2.777654	2.773554	-0.018	0.018	537.665	537.665	537.665	25.948	0.000	11	12
6	21	8	2.787551	2.787549	2.787547	397.443	397.450	538.640	538.640	538.640	26.221	0.000	13	14
7	301	9	2.740000	2.169170	1.598339	181.930	181.988	526.270	526.270	526.270	33.173	-207.671	15	16
8	1	10	0.808470	0.808470	0.808470	1272.610	1272.610	462.975	462.975	462.975	876.526	0.000	17	18
8	201	11	0.808470	0.808470	0.808470	1272.610	1272.610	462.975	462.975	462.975	876.526	0.000	18	19
8	2	12	0.808470	0.808464	0.808457	1272.610	1272.614	462.975	462.973	462.972	876.528	0.000	19	20
8	301	13	0.808457	0.890013	0.971569	1272.614	1272.636	462.972	481.166	498.903	856.563	207.660	20	21
8	3	14	0.971569	0.971554	0.971539	1272.636	1272.649	498.903	498.900	498.896	835.373	0.000	21	22
8	3	15	0.971539	0.971522	0.971506	1272.649	1272.662	498.896	498.893	498.889	835.382	0.000	22	23
9	5	16	0.971246	0.971232	0.971217	392.279	392.282	498.793	498.790	498.787	836.757	0.000	24	25
9	5	17	0.971217	0.971204	0.971190	392.282	392.285	498.787	498.784	498.781	836.764	0.000	25	26
9	5	18	0.971190	0.971177	0.971163	392.285	392.288	498.781	498.778	498.776	836.771	0.000	26	27
10	4	19	0.971246	0.971232	0.971217	880.484	880.492	498.794	498.791	498.788	836.730	0.000	28	29
10	4	20	0.971217	0.971202	0.971187	880.492	880.500	498.788	498.785	498.781	836.738	0.000	29	30
10	4	21	0.971187	0.971171	0.971155	880.500	880.509	498.781	498.778	498.775	836.746	0.000	30	31

SYSTEM MODULES

MODULE 1 IS B.C. NUMBER 1, MODID 413,NPATH= 0
 MODULE 2 IS PIPE NUMBER 1, MODID 23,NPATH= 2
 MODULE 3 IS VOL. NUMBER 1, MODID 111,NPATH= 1
 MODULE 4 IS PIPE NUMBER 2, MODID 22,NPATH= 3
 MODULE 5 IS VOL. NUMBER 2, MODID 112,NPATH= 1
 MODULE 6 IS TBSG NUMBER 1, MODID 601,NPATH= 1
 SPEED IN RPM IS 1800.00, EFFICIENCY IS 0.42742, POWER FROM GEN -8.314E+08 J/S
 MODULE 7 IS B.C. NUMBER 2, MODID 412,NPATH= 0
 MODULE 8 IS VALV NUMBER 1, MODID 502,NPATH= 1
 RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.656E-04,AS DETERMINED USING OPTION 1
 MODULE 9 IS B.C. NUMBER 3, MODID 414,NPATH= 0
 MODULE 10 IS VALV NUMBER 2, MODID 501,NPATH= 1
 RELATIVE VALVE POSITION IS 0.0000100,AND CHOKE FLOW IS 0.690E-04,AS DETERMINED USING OPTION 1
 MODULE 11 IS B.C. NUMBER 4, MODID 416,NPATH= 0
 MODULE 12 IS B.C. NUMBER 5, MODID 411,NPATH= 0
 MODULE 13 IS PIPE NUMBER 3, MODID 21,NPATH= 1
 MODULE 14 IS B.C. NUMBER 6, MODID 403,NPATH= 0
 MODULE 15 IS H.X. NUMBER 1, MODID 301,NPATH= 1

THE HEAT FLUX AREA CORRECTION FACTOR IS 0.782411

T NOD	I NOD	O NOD	QINR(KJ/S/M)	TINR(K)	T TUBE(K)	TOUTR(K)	QOUTR(KJ/S/M)	MODE,I	MODE,O	T,CORE	T,STRC
1	13	9	9.97519	481.16630	493.29602	526.27034	-9.97572	1	6	481.2	526.3

MODULE 16 IS B.C. NUMBER 7, MODID 406,NPATH= 0
 MODULE 17 IS B.C. NUMBER 8, MODID 401,NPATH= 0
 MODULE 18 IS PIPE NUMBER 4, MODID 1,NPATH= 1
 MODULE 19 IS PUMP NUMBER 1, MODID 201,NPATH= 2
 PUMP SPEED= 3570.000 PUMP FLOW= 636.305 KG/S PUMP HEAD= 532.746 METERS
 MODULE 20 IS PIPE NUMBER 5, MODID 2,NPATH= 1
 MODULE 21 IS PIPE NUMBER 6, MODID 3,NPATH= 1
 MODULE 22 IS VOL. NUMBER 3, MODID 101,NPATH= 1
 MODULE 23 IS PIPE NUMBER 7, MODID 5,NPATH= 1
 MODULE 24 IS B.C. NUMBER 9, MODID 402,NPATH= 0
 MODULE 25 IS PIPE NUMBER 8, MODID 4,NPATH= 2
 MODULE 26 IS B.C. NUMBER 10, MODID 404,NPATH= 0

STANDARD TIME STEP NUMBER = 25 ACTUAL TIME STEP NUMBER = 621 TIME = 2.508005E+01 SECONDS

NORMALIZED CORE POWER	CORE POWER (MW)	THERMAL POWER (BTU/HR)	HEAT REMOV. RATE (BTU/HR)	ENERGY BALANCE (BTU)	WATER MASS BALANCE (LBM)	AIR MASS BALANCE (LBM)
3.490068E-02	8.027155E+01	2.903338E+08	0.000000E+00	3.865114E+08	8.705184E+05	3.306896E+03

VOLUME NUMBER	AVG. PRES. (PSIA)	TOT. MASS (LB)	AVG. ENTH. (BTU/LB)	AVG. DEN. (LB/FT3)	AVG. TEMP. (DEG. F)	AVG. QUAL.	BUBB. MASS (LB)	MIX. LEV. (FT)	LIQ. MASS (LB)
1	1.59031E+03	4.32323E+04	5.61387E+02	4.57969E+01	5.59871E+02	0.00000E+00	0.00000E+00	1.16700E+01	4.32323E+04
2	1.57721E+03	8.73092E+03	5.62694E+02	4.57116E+01	5.60842E+02	0.00000E+00	0.00000E+00	3.59000E+00	8.73092E+03
3	1.57744E+03	1.22412E+04	5.65331E+02	4.55570E+01	5.62849E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.22412E+04
4	1.57248E+03	1.03888E+04	5.53927E+02	4.62135E+01	5.54094E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.03888E+04
5	1.56707E+03	1.05176E+04	5.43605E+02	4.67864E+01	5.46025E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.05176E+04
7	1.56083E+03	2.13243E+04	5.31590E+02	4.74295E+01	5.36466E+02	0.00000E+00	0.00000E+00	9.40500E+00	2.13243E+04
8	1.56112E+03	1.07149E+04	5.27120E+02	4.76640E+01	5.32870E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.07149E+04
9	1.56266E+03	1.07461E+04	5.24454E+02	4.78030E+01	5.30716E+02	0.00000E+00	0.00000E+00	1.05400E+01	1.07461E+04
10	1.56486E+03	1.28125E+04	5.26793E+02	4.76832E+01	5.32612E+02	0.00000E+00	0.00000E+00	5.91000E+00	1.28125E+04
11	1.56136E+03	1.24255E+04	5.28905E+02	4.75710E+01	5.34309E+02	0.00000E+00	0.00000E+00	1.20500E+01	1.24255E+04
12	1.58677E+03	1.82157E+04	5.31740E+02	4.74368E+01	5.36629E+02	0.00000E+00	0.00000E+00	5.19000E+00	1.82157E+04
13	1.60506E+03	7.65875E+03	5.32768E+02	4.73933E+01	5.37483E+02	0.00000E+00	0.00000E+00	2.29000E+00	7.65875E+03
14	1.60055E+03	8.70853E+03	5.33932E+02	4.73290E+01	5.38407E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.70853E+03
15	1.60181E+03	8.69826E+03	5.34996E+02	4.72731E+01	5.39259E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.69826E+03
16	1.60456E+03	8.68905E+03	5.35964E+02	4.72231E+01	5.40037E+02	0.00000E+00	0.00000E+00	8.63000E+00	8.68905E+03
17	1.60471E+03	3.42685E+04	5.38780E+02	4.70721E+01	5.42277E+02	0.00000E+00	0.00000E+00	9.79000E+00	3.42685E+04
18	1.60064E+03	7.74440E+03	5.44879E+02	4.67375E+01	5.47088E+02	0.00000E+00	0.00000E+00	4.02000E+00	7.74440E+03
19	1.59771E+03	7.68065E+03	5.51759E+02	4.63527E+01	5.52461E+02	0.00000E+00	0.00000E+00	4.00000E+00	7.68065E+03
20	1.59476E+03	7.62187E+03	5.57962E+02	4.59980E+01	5.57253E+02	0.00000E+00	0.00000E+00	4.10000E+00	7.62187E+03
21	1.60079E+03	1.99697E+03	5.40301E+02	4.69875E+01	5.43476E+02	0.00000E+00	0.00000E+00	1.21000E+01	1.99697E+03
22	1.58781E+03	2.41301E+04	5.40249E+02	4.69824E+01	5.43412E+02	0.00000E+00	0.00000E+00	7.67000E+00	2.41301E+04
23	1.57495E+03	4.29414E+03	5.75176E+02	4.49649E+01	5.70254E+02	0.00000E+00	0.00000E+00	3.59000E+00	4.29414E+03
24	1.57771E+03	6.02191E+03	5.77808E+02	4.48058E+01	5.72218E+02	0.00000E+00	0.00000E+00	5.91000E+00	6.02191E+03
25	1.57275E+03	5.12936E+03	5.63950E+02	4.56349E+01	5.61790E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.12936E+03
26	1.56737E+03	5.20994E+03	5.51424E+02	4.63518E+01	5.52142E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.20994E+03
28	1.56114E+03	1.05992E+04	5.36856E+02	4.71493E+01	5.40673E+02	0.00000E+00	0.00000E+00	9.40500E+00	1.05992E+04
29	1.56141E+03	5.33198E+03	5.31444E+02	4.74376E+01	5.36350E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.33198E+03
30	1.56294E+03	5.35129E+03	5.28189E+02	4.76094E+01	5.33735E+02	0.00000E+00	0.00000E+00	1.05400E+01	5.35129E+03
31	1.56512E+03	6.38215E+03	5.30562E+02	4.74862E+01	5.35648E+02	0.00000E+00	0.00000E+00	5.91000E+00	6.38215E+03
32	1.56161E+03	6.18680E+03	5.32685E+02	4.73721E+01	5.37345E+02	0.00000E+00	0.00000E+00	1.20500E+01	6.18680E+03
33	1.58694E+03	9.06998E+03	5.35461E+02	4.72395E+01	5.39605E+02	0.00000E+00	0.00000E+00	5.19000E+00	9.06998E+03
34	1.60515E+03	3.81356E+03	5.36449E+02	4.71976E+01	5.40424E+02	0.00000E+00	0.00000E+00	2.29000E+00	3.81356E+03
35	1.60064E+03	4.33190E+03	5.37525E+02	4.71371E+01	5.41273E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.33190E+03
36	1.60188E+03	4.32726E+03	5.38479E+02	4.70866E+01	5.42033E+02	0.00000E+00	0.00000E+00	8.63000E+00	4.32726E+03
37	1.60462E+03	4.32327E+03	5.39315E+02	4.70432E+01	5.42702E+02	0.00000E+00	0.00000E+00	8.62000E+00	4.32327E+03
39	LIQ REG VAP REG	1.62309E+03	2.59412E+03	6.29431E+02	3.98818E+01	6.07148E+02	4.41768E-03	1.14600E+01	1.82127E+00
40		1.57858E+03	5.07119E+03	1.13856E+03	4.10637E+00	6.07148E+02	9.53997E-01	4.83790E+03	1.82127E+00
101		7.84667E+02	1.23964E+03	6.31854E+02	3.52170E+01	6.03300E+02	1.89561E-02	2.34987E+01	9.23000E+00
131		7.76633E+02	1.00317E+05	5.39657E+02	2.12132E+01	5.15556E+02	4.69537E-02	2.27862E+03	3.74721E+01
132		7.61059E+02	2.30829E+02	1.19931E+03	1.69727E+00	5.14380E+02	9.98956E-01	2.30588E+02	3.24200E+01
201		7.76898E+02	7.59689E+02	1.19849E+03	1.66416E+00	5.12075E+02	9.97214E-01	7.57573E+02	1.36300E+01
231		7.70322E+02	2.04182E+05	5.37032E+02	2.15883E+01	5.14419E+02	4.50516E-02	3.85913E+03	3.57130E+01
232		7.58206E+02	4.57650E+02	1.19954E+03	1.68254E+00	5.13450E+02	9.99056E-01	4.57218E+02	3.24200E+01
500		6.14681E+02	1.44184E+03	1.19869E+03	1.65729E+00	5.11649E+02	9.97401E-01	1.43809E+03	1.36300E+01
501		6.14681E+02	1.11384E+05	4.80058E+01	4.51859E+01	8.00000E+01	1.01518E-05	0.00000E+00	1.23900E+01
		5.56918E+04	4.80058E+01	4.51859E+01	8.00000E+01	1.01518E-05	0.00000E+00	1.23900E+01	5.56913E+04

701	7.90597E+02	6.07688E+03	4.17966E+02	5.22069E+01	4.38812E+02	0.00000E+00	0.00000E+00	2.00000E+00	6.07688E+03
801	7.83021E+02	1.21523E+04	4.18047E+02	5.22006E+01	4.38888E+02	0.00000E+00	0.00000E+00	2.00000E+00	1.21523E+04
900	1.47000E+01	6.44163E+04	1.18996E+03	3.30340E-02	3.00000E+02	1.00000E+00	6.44163E+04	0.00000E+00	0.00000E+00
901	7.48232E+02	1.65838E+00	1.19843E+03	1.63548E+00	5.10149E+02	9.96685E-01	1.65288E+00	1.36300E+01	5.49812E-03
902	7.48181E+02	3.31558E+00	1.19864E+03	1.63490E+00	5.10141E+02	9.96978E-01	3.30556E+00	1.36300E+01	1.00212E-02

JUNCTION NUMBER	CONNECTS VOLUMES	CHOKE MODE	JUN. FLOW (LB/SEC)	JUN. ENTH. (BTU/LB)	JUN. SPVL. (FT3/LB)	P R E S S U R E				D I F F E R E N T ACCL. PSI	I A L S PUMP PSI
						STAG. PSI	ELEV. PSI	FRIC. PSI	ACCL. PSI		
1	1 TO 2		1.43892E+04	5.61536E+02	2.18385E-02	7.58713E+00	1.43438E-01	-8.00625E+00	-2.75686E-01	0.00000E+00	0.00000E+00
2	2 TO 3		1.43702E+04	5.62865E+02	2.18802E-02	5.47320E+00	-1.00064E+00	-4.69705E+00	-2.24494E-01	0.00000E+00	0.00000E+00
3	3 TO 4		1.43423E+04	5.65501E+02	2.19546E-02	4.02633E+00	-2.62563E+00	-1.46445E+00	-6.37505E-02	0.00000E+00	0.00000E+00
4	4 TO 5		1.43149E+04	5.54128E+02	2.16439E-02	5.44209E+00	-3.40281E+00	-2.14128E+00	-1.02007E-01	0.00000E+00	0.00000E+00
5	5 TO 7		1.42865E+04	5.43817E+02	2.13790E-02	6.30035E+00	-3.23932E+00	-3.20881E+00	-1.47784E-01	0.00000E+00	0.00000E+00
7	7 TO 8		1.42338E+04	5.31807E+02	2.10884E-02	3.27129E-01	-2.48212E-01	-3.16428E+00	-1.41211E-01	0.00000E+00	0.00000E+00
8	8 TO 9		1.42089E+04	5.27330E+02	2.09841E-02	-1.51354E+00	3.49320E+00	-2.07178E+00	-9.21227E-02	0.00000E+00	0.00000E+00
9	9 TO 10		1.41855E+04	5.24655E+02	2.09228E-02	-1.26243E+00	2.72749E+00	-1.51427E+00	-4.92119E-02	0.00000E+00	0.00000E+00
10	10 TO 11		1.41586E+04	5.26967E+02	2.09748E-02	-5.29573E-01	2.49543E+00	-2.20533E+00	-2.39476E-01	0.00000E+00	0.00000E+00
11	11 TO 12		1.41334E+04	5.29085E+02	2.10246E-02	-2.26374E+01	-7.77105E-01	-1.14736E+00	-4.42228E-01	2.41196E+01	2.41196E+01
12	12 TO 13		1.41002E+04	5.31882E+02	2.10833E-02	-2.38614E+01	-4.74300E-01	-2.48788E-01	-4.64845E-01	0.00000E+00	0.00000E+00
13	13 TO 14		1.40872E+04	5.32925E+02	2.11030E-02	9.33334E+00	-5.42246E-01	-9.04627E+00	-2.55175E-01	0.00000E+00	0.00000E+00
14	14 TO 15		1.40488E+04	5.34084E+02	2.11311E-02	-1.23508E+00	2.83444E+00	-1.70603E+00	-1.06674E-01	0.00000E+00	0.00000E+00
15	15 TO 16		1.40365E+04	5.35136E+02	2.11558E-02	-2.75447E+00	2.82803E+00	-1.81254E-01	-1.07699E-01	0.00000E+00	0.00000E+00
16	16 TO 17		1.40256E+04	5.36094E+02	2.11780E-02	1.47755E+00	1.96895E+00	-3.52816E+00	-8.16567E-02	0.00000E+00	0.00000E+00
17	17 TO 18		2.02765E+04	5.38865E+02	2.12457E-02	3.71775E+00	-2.25233E+00	-1.51892E+00	-5.34976E-02	0.00000E+00	0.00000E+00
18	18 TO 19		2.02665E+04	5.45000E+02	2.13986E-02	2.13986E+00	-1.29600E+00	-1.67162E+00	-2.91661E-02	0.00000E+00	0.00000E+00
19	19 TO 20		2.02526E+04	5.51912E+02	2.15771E-02	2.95036E+00	-1.29841E+00	-1.68116E+00	-2.92099E-02	0.00000E+00	0.00000E+00
20	20 TO 1		2.02351E+04	5.58143E+02	2.17443E-02	4.86774E+00	-2.44639E+00	-2.45021E+00	-2.88577E-02	0.00000E+00	0.00000E+00
21	21 TO 1		7.23441E+02	5.40347E+02	2.12832E-02	1.03164E+01	-3.77159E+00	-6.58708E+00	-4.22678E-02	0.00000E+00	0.00000E+00
22	22 TO 1		4.51274E+01	5.40266E+02	2.12839E-02	-2.80970E+00	2.81060E+00	-5.13643E-03	-4.24357E-03	0.00000E+00	0.00000E+00
23	23 TO 24		7.18427E+03	5.75372E+02	2.22446E-02	5.53562E+00	-9.84163E-01	-4.77324E+00	-2.21787E-01	0.00000E+00	0.00000E+00
24	24 TO 25		7.16831E+03	5.77993E+02	2.23234E-02	4.00939E+00	-2.58897E+00	-1.48435E+00	-6.39226E-02	0.00000E+00	0.00000E+00
25	25 TO 26		7.15288E+03	5.64167E+02	2.19191E-02	5.42425E+00	-3.36564E+00	-2.16061E+00	-1.02009E-01	0.00000E+00	0.00000E+00
26	26 TO 28		7.13706E+03	5.51652E+02	2.15801E-02	6.29500E+00	-3.21435E+00	-3.22709E+00	-1.46437E-01	0.00000E+00	0.00000E+00
28	28 TO 29		7.10822E+03	5.37087E+02	2.12141E-02	-2.25910E-01	3.25390E+00	-3.16799E+00	-1.39994E-01	0.00000E+00	0.00000E+00
29	29 TO 30		7.09469E+03	5.31667E+02	2.10846E-02	-1.49663E+00	3.47777E+00	-2.07223E+00	-9.10944E-02	0.00000E+00	0.00000E+00
30	30 TO 31		7.08205E+03	5.28401E+02	2.10082E-02	-1.25051E+00	2.71632E+00	-1.51435E+00	-4.85370E-02	0.00000E+00	0.00000E+00
31	31 TO 32		7.06777E+03	5.30744E+02	2.10620E-02	-5.14651E-01	2.48501E+00	-2.20721E+00	-2.36855E-01	0.00000E+00	0.00000E+00
32	32 TO 33		7.05467E+03	5.32869E+02	2.11131E-02	-2.25550E+01	-7.73875E-01	-1.14823E+00	-4.38607E-01	2.40385E+01	2.40385E+01
33	33 TO 34		7.03816E+03	5.35601E+02	2.11714E-02	-2.37793E-01	-4.72327E-01	-2.48975E-01	-4.62079E-01	0.00000E+00	0.00000E+00
34	34 TO 35		7.03188E+03	5.36601E+02	2.11904E-02	9.33913E+00	-5.40052E-01	-9.05316E+00	-2.54086E-01	0.00000E+00	0.00000E+00
35	35 TO 36		7.01310E+03	5.37669E+02	2.12170E-02	-1.22233E+00	2.82313E+00	-1.70717E+00	-1.06366E-01	0.00000E+00	0.00000E+00
36	36 TO 37		7.00763E+03	5.38608E+02	2.12394E-02	-2.74513E+00	2.81873E+00	-1.81163E-01	-1.07570E-01	0.00000E+00	0.00000E+00
37	37 TO 17		7.00301E+03	5.39431E+02	2.12587E-02	1.47957E+00	1.96195E+00	-3.52350E+00	-8.19836E-02	0.00000E+00	0.00000E+00
39	39 TO 40		1.41347E+03	6.28142E+02	2.43214E-02	2.56296E+01	2.06678E+00	-2.78044E+01	-1.07960E-01	0.00000E+00	0.00000E+00
40	40 TO 23		1.39759E+03	6.32266E+02	2.86371E-02	3.47191E+00	9.44868E-01	-5.10615E+00	-6.89373E-01	0.00000E+00	0.00000E+00
42	17 TO 21		7.24020E+02	5.38866E+02	2.12457E-02	4.19511E+00	-3.57410E+00	-6.74350E-01	-5.33406E-02	0.00000E+00	0.00000E+00
43	1 TO 23		6.52269E+03	6.61540E+02	2.18386E-02	6.18356E+00	1.64708E-01	-6.58458E+00	-2.54545E-01	0.00000E+00	0.00000E+00
44	35 TO 22		1.24518E+01	5.37629E+02	2.12167E-02	1.67183E+01	-2.66358E+00	-1.41001E+01	-4.53885E-02	0.00000E+00	0.00000E+00
45	14 TO 22		2.49167E+01	5.34044E+02	2.11309E-02	1.66308E+01	-2.66931E+00	-1.40065E+01	-4.50339E-02	0.00000E+00	0.00000E+00
75	23 TO 900	EXT-HEN	7.24753E+02	5.73241E+02	2.21804E-02	1.57758E+03	1.63981E-01	1.57786E+03	-2.66450E-04	0.00000E+00	0.00000E+00
100	701 TO 101		2.71914E-01	4.17970E+02	2.91545E-02	5.92818E+00	-5.92834E+00	-3.82063E-07	-1.58728E-04	0.00000E+00	0.00000E+00
101	101 TO 131		8.62727E+02	1.19980E+03	5.84086E-01	3.26885E+00	-1.48877E+00	-1.82090E+00	-4.08274E-02	0.00000E+00	0.00000E+00
131	131 TO 132		8.65239E+02	1.19717E+03	5.87022E-01	1.53294E+01	2.70049E-01	-1.57575E+01	-1.58043E-01	0.00000E+00	0.00000E+00
200	801 TO 201		5.20085E-01	4.18050E+02	1.91568E-02	6.12034E+00	-6.12099E+00	-3.53128E-07	-6.53062E-04	0.00000E+00	0.00000E+00
201	201 TO 231		1.52242E+03	1.20001E+03	5.90255E-01	2.83972E+00	-1.43592E+00	-1.43780E+00	-3.39976E-02	0.00000E+00	0.00000E+00
231	231 TO 232		1.52725E+03	1.19785E+03	5.92499E-01	1.19524E+01	2.68058E-01	-1.23719E+01	-1.51477E-01	0.00000E+00	0.00000E+00
500	500 TO 13		0.00000E+00	5.32951E+02	2.11035E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
501	501 TO 34		0.00000E+00	5.36627E+02	2.11910E-02	0.00000E+00	3.70957E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
901	132 TO 901		8.72866E+02	1.19845E+03	6.01207E-01	1.28832E+01	1.36402E-03	-1.24649E+01	4.19683E-01	0.00000E+00	0.00000E+00
902	232 TO 902		1.54149E+03	1.19866E+03	6.03509E-01	1.02132E+01	1.06513E-03	-9.77374E+00	4.40495E-01	0.00000E+00	0.00000E+00

800	0 TO 801	0.00000E+00	4.18050E+02	1.91568E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
700	0 TO 701	0.00000E+00	4.17970E+02	1.91545E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
601	0 TO 36	0.00000E+00	5.38610E+02	2.12398E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
600	0 TO 15	0.00000E+00	5.35138E+02	2.11562E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
290	0 TO 201	0.00000E+00	5.07760E+02	2.13207E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
254	0 TO 232	0.00000E+00	1.19912E+03	6.03219E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
253	0 TO 232	0.00000E+00	1.19912E+03	6.03219E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
252	0 TO 232	0.00000E+00	1.19912E+03	6.03219E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
251	0 TO 232	0.00000E+00	1.19912E+03	6.03219E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
235	0 TO 232	0.00000E+00	1.19912E+03	6.03219E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
234	0 TO 232	0.00000E+00	1.19912E+03	6.03219E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
232	0 TO 232	0.00000E+00	1.19912E+03	6.03219E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
190	0 TO 101	0.00000E+00	5.09396E+02	2.15798E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
154	0 TO 132	0.00000E+00	1.19903E+03	6.00818E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
153	0 TO 132	0.00000E+00	1.19903E+03	6.00818E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
152	0 TO 132	0.00000E+00	1.19903E+03	6.00818E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
151	0 TO 132	0.00000E+00	1.19903E+03	6.00818E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
135	0 TO 132	0.00000E+00	1.19903E+03	6.00818E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
134	0 TO 132	0.00000E+00	1.19903E+03	6.00818E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
132	0 TO 132	0.00000E+00	1.19903E+03	6.00818E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
95	0 TO 34	0.00000E+00	5.36626E+02	2.11910E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
94	0 TO 13	0.00000E+00	5.32950E+02	2.11036E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
92	0 TO 13	0.00000E+00	5.32951E+02	2.11035E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

VOLUME NUMBER	SLIP VEL. (FT/SEC)	VOID FRACTION	LIQUID FLOW (LB/SEC)	GAS FLOW (LB/SEC)	VOL. FLOW (LB/SEC)	GAS VEL. (FT/SEC)	LIQ. VEL. (FT/SEC)	VG/VL	FLOW REGIME
40	-4.42380E-01	1.75721E-01	1.37855E+03	2.69833E+01	1.40553E+03	6.69517E+01	6.65093E+01	1.00665E+00	2

JUNCTION NUMBER	SLIP VEL. (FT/SEC)	VOID FRACTION	LIQUID FLOW (LB/SEC)	GAS FLOW (LB/SEC)	SLIP CNVCTN (BTU/SEC)	GAS VEL. (FT/SEC)	LIQ. VEL. (FT/SEC)	VG/VL	FLOW REGIME
40	-8.84760E-01	1.83694E-01	1.37275E+03	2.83379E+01	1.97494E+02	6.77388E+01	6.68540E+01	1.01323E+00	2

PUMP NUMBER	VOLUME NUMBER	PUMP SPEED (RPM)	NORM. PUMP TORQUE	NORM. FRIC. TORQUE	NORM. MOT. TORQUE	POWER TO H2O (BTU/HR)
1	33	8.74988E+02	5.37867E-01	1.00000E+00	0.00000E+00	5.45038E+06
2	12	8.73956E+02	5.39285E-01	1.00000E+00	0.00000E+00	1.09166E+07

HEAT COND. NUMBER	VOL. NUM.	H.T. MODE	SURF. FLUX (BTU/HR-FT2)	CRIT. FLUX (BTU/HR-FT2)	H.T. COEF. (BTU/H-F2-F)	SURF. TEMP. (DEG. F)	MASS FLUX (LBM/HR-FT2)	STORD ENRGY (BTU)	POWR TO H2O (BTU/HR)	
1	RIGHT	18	1	2.87899E+04	1.53378E+06	4.49503E+03	5.53596E+02	1.77004E+06	3.37936E+06	4.09456E+08
2	RIGHT	19	1	3.20009E+04	1.52209E+06	4.51265E+03	5.59680E+02	1.76907E+06	3.48345E+06	4.55123E+08
3	RIGHT	20	1	2.78393E+04	1.51171E+06	4.52767E+03	5.63549E+02	1.76779E+06	3.41062E+06	3.95937E+08
16	RIGHT	2	1	2.04414E+04	1.50723E+06	5.10421E+03	5.64984E+02	5.66462E+06	2.55924E+06	6.05067E+06
17	RIGHT	3	1	1.63126E+04	1.50252E+06	7.91234E+02	5.83607E+02	6.89975E+05	8.10602E+06	4.46411E+07
18	RIGHT	10	1	6.34636E+03	1.57524E+06	7.64644E+02	5.41067E+02	6.81375E+05	7.34287E+06	1.73675E+07
19	RIGHT	11	1	3.04163E+04	1.57210E+06	4.38095E+03	5.41402E+02	4.88258E+06	3.60025E+06	1.33224E+07
20	RIGHT	12	1	1.81897E+04	1.56097E+06	2.53928E+03	5.43930E+02	2.65943E+06	1.74951E+07	6.42823E+06
21	RIGHT	13	1	1.20530E+04	1.55463E+06	5.43397E+03	5.39832E+02	6.18641E+06	1.91105E+06	3.08557E+06
22	RIGHT	14	1	2.13173E+04	1.55363E+06	4.12905E+03	5.43692E+02	3.29842E+06	7.15263E+06	5.16732E+06
23	RIGHT	15	1	1.90437E+04	1.55140E+06	4.12287E+03	5.43992E+02	3.28952E+06	7.15344E+06	4.61619E+06
24	RIGHT	16	1	1.69421E+04	1.54897E+06	4.12255E+03	5.44251E+02	3.28677E+06	7.15421E+06	4.10678E+06
25	RIGHT	17	1	4.93661E+03	1.54387E+06	1.64689E+03	5.45354E+02	1.02210E+06	4.36352E+06	1.37090E+06
26	RIGHT	23	1	1.97676E+04	1.48589E+06	5.55370E+03	5.73963E+02	6.23394E+06	1.28384E+06	2.92560E+06
27	RIGHT	24	1	1.36153E+04	1.48079E+06	7.97182E+02	5.89448E+02	6.89731E+05	4.07483E+06	1.86298E+07
28	RIGHT	31	1	5.36380E+03	1.56812E+06	7.65516E+02	5.42816E+02	6.80294E+05	3.67717E+06	7.33928E+06
29	RIGHT	32	1	2.65396E+04	1.56498E+06	4.38560E+03	5.43549E+02	4.87436E+06	1.80142E+06	5.81216E+06
30	RIGHT	33	1	1.43590E+04	1.55408E+06	2.54180E+03	5.45390E+02	2.65487E+06	8.75181E+06	2.53724E+06
31	RIGHT	34	1	1.06996E+04	1.54789E+06	5.43930E+03	5.42518E+02	6.17594E+06	9.56473E+05	1.36955E+06
32	RIGHT	35	1	1.63107E+04	1.54706E+06	4.13301E+03	5.45335E+02	3.29299E+06	3.57829E+06	1.97686E+06
33	RIGHT	36	1	1.40020E+04	1.54505E+06	4.12677E+03	5.45530E+02	3.28436E+06	3.57857E+06	1.69705E+06

34	RIGHT	37	1	1.19331E+04	1.54289E+06	4.12644E+03	5.45687E+02	3.28195E+06	3.57883E+06	1.44629E+06
35	RIGHT	22	1	3.32015E+01	1.54539E+06	9.85607E+00	5.46797E+02	2.44825E+03	9.74425E+06	8.07460E+03
4	LEFT	4	1	-5.73223E+04	1.52374E+06	5.32057E+03	5.43487E+02	2.42802E+06		-6.77692E+08
	RIGHT	201	11	5.18235E+04	1.52032E+06	6.76266E+03	5.22177E+02	1.55479E+04	1.67204E+06	6.91719E+08
5	LEFT	5	1	-4.38001E+04	1.54356E+06	5.27863E+03	5.37905E+02	2.42351E+06		-6.28484E+08
	RIGHT	201	11	3.98819E+04	1.52032E+06	5.67915E+03	5.21536E+02	1.55479E+04	2.01800E+06	6.46083E+08
6	LEFT	7	1	-2.81948E+04	1.56712E+06	5.22748E+03	5.31247E+02	2.41694E+06		-4.04513E+08
	RIGHT	201	11	2.60691E+04	1.52032E+06	4.27744E+03	5.20608E+02	1.55479E+04	1.98725E+06	4.22263E+08
9	LEFT	9	1	-1.91154E+04	1.58012E+06	5.18588E+03	5.27192E+02	2.40666E+06		-2.25992E+08
	RIGHT	201	11	1.80143E+04	1.52032E+06	3.34332E+03	5.19902E+02	1.55479E+04	1.64126E+06	2.40447E+08
8	LEFT	8	1	-2.24793E+04	1.57544E+06	5.20167E+03	5.28717E+02	2.41063E+06		-3.22553E+08
	RIGHT	201	11	2.10022E+04	1.52032E+06	3.70347E+03	5.20184E+02	1.55479E+04	1.99679E+06	3.40234E+08
7	LEFT	7	1	-2.81948E+04	1.56712E+06	5.22748E+03	5.31247E+02	2.41694E+06		-4.04513E+08
	RIGHT	201	11	2.60691E+04	1.52032E+06	4.27744E+03	5.20608E+02	1.55479E+04	1.98725E+06	4.22263E+08
10	LEFT	25	1	-6.85341E+04	1.50584E+06	5.35133E+03	5.49160E+02	2.42655E+06		-4.05211E+08
	RIGHT	101	11	6.18008E+04	1.52155E+06	7.62525E+03	5.23758E+02	1.76218E+04	8.42095E+05	4.12537E+08
11	LEFT	26	1	-5.21475E+04	1.52927E+06	5.30109E+03	5.42494E+02	2.42152E+06		-3.74212E+08
	RIGHT	101	11	4.73182E+04	1.52155E+06	6.38180E+03	5.23068E+02	1.76218E+04	1.01523E+06	3.83360E+08
12	LEFT	28	1	-3.31664E+04	1.55724E+06	5.24041E+03	5.34529E+02	2.41430E+06		-2.37973E+08
	RIGHT	101	11	3.05089E+04	1.52155E+06	4.76294E+03	5.22059E+02	1.76218E+04	9.98417E+05	2.47144E+08
15	LEFT	30	1	-2.20591E+04	1.57302E+06	5.19224E+03	5.29657E+02	2.40314E+06		-1.30426E+08
	RIGHT	101	11	2.06532E+04	1.52155E+06	3.67211E+03	5.21278E+02	1.76218E+04	8.23868E+05	1.37866E+08
14	LEFT	29	1	-2.62004E+04	1.56725E+06	5.21052E+03	5.31500E+02	2.40742E+06		-1.88015E+08
	RIGHT	101	11	2.43319E+04	1.52155E+06	4.09615E+03	5.21594E+02	1.76218E+04	1.00268E+06	1.97131E+08
13	LEFT	28	1	-3.31664E+04	1.55724E+06	5.24041E+03	5.34529E+02	2.41430E+06		-2.37973E+08
	RIGHT	101	11	3.05089E+04	1.52155E+06	4.76294E+03	5.22059E+02	1.76218E+04	9.98417E+05	2.47144E+08

CORE SECT. NUMBER	HEAT COND. NUMBER	DEPTH REAC. EXT. ZR-H2O (FT)	DEPTH REAC. INT. ZR-H2O (FT)	HEAT GEN. ZR-H2O (BTU/HR)	COND. HEAT- ING RATE (BTU/HR)	DIR. MODER- ATOR HT RT (BTU/HR)	AVG. METAL TEMPERATURE (DEG. F)	CENTERLINE TEMPERATURE (DEG. F)
1	1	0.00000E+00	0.00000E+00	0.00000E+00	9.16529E+07	0.00000E+00	6.91088E+02	7.47675E+02
2	2	0.00000E+00	0.00000E+00	0.00000E+00	9.77925E+07	0.00000E+00	7.12806E+02	7.77033E+02
3	3	0.00000E+00	0.00000E+00	0.00000E+00	8.45215E+07	0.00000E+00	6.95699E+02	7.50151E+02

CONTEXT SAVE AT 25.08005 SECONDS STEP NO. 621

WRITTEN TO UNIT NUMBER 34

DATA RECORD NUMBER 27 WAS WRITTEN ON TAPE VSN = , DENSITY = PE, CREATED ON 90159
AND WAS LABELED RETRAN1

TRAILER LABEL WRITTEN ON UNIT 14

SYSTEM ELAPSED TIME (SEC)	CBLK -25 CNTL OUTPUT	TRIP 30 TRIP STATUS	CBLK -15 CNTL OUTPUT	CBLK -16 CNTL OUTPUT	CBLK -23 CNTL OUTPUT	CBLK -24 CNTL OUTPUT	JUN 1 MASS FLOW (LB/SEC)	VOL 39 AVG. PRESS. (PSI)
0.00000E+00	-9.28114E+00	0.00000E+00	5.75339E+01	5.75339E+01	6.68150E+01	6.68150E+01	1.87778E+04	2.25000E+03
1.00000E+00	-9.25801E+00	0.00000E+00	5.75339E+01	5.75339E+01	6.67919E+01	6.67918E+01	1.87778E+04	2.25000E+03
2.00000E+00	-9.24129E+00	0.00000E+00	5.75339E+01	5.75340E+01	6.67752E+01	6.67751E+01	1.87778E+04	2.25000E+03
3.00000E+00	-9.22912E+00	0.00000E+00	5.75341E+01	5.75341E+01	6.67632E+01	6.67631E+01	1.87779E+04	2.25000E+03
4.00000E+00	-9.22014E+00	0.00000E+00	5.75344E+01	5.75344E+01	6.67545E+01	6.67544E+01	1.87779E+04	2.24999E+03
5.00000E+00	-9.21348E+00	0.00000E+00	5.75349E+01	5.75348E+01	6.67484E+01	6.67482E+01	1.87779E+04	2.24999E+03
6.00000E+00	-8.54610E+00	0.00000E+00	5.74911E+01	5.85859E+01	6.60372E+01	6.59918E+01	1.88164E+04	2.23275E+03
7.00000E+00	-7.75345E+00	0.00000E+00	5.74808E+01	5.95364E+01	6.52342E+01	6.50399E+01	1.87337E+04	2.21474E+03
8.00000E+00	-6.98150E+00	0.00000E+00	5.74435E+01	6.03407E+01	6.44250E+01	6.40567E+01	1.87454E+04	2.19631E+03
9.00000E+00	-6.21402E+00	0.00000E+00	5.74042E+01	6.06119E+01	6.36182E+01	6.30877E+01	1.87380E+04	2.17795E+03
1.00000E+01	-5.43922E+00	0.00000E+00	5.73659E+01	6.06897E+01	6.28051E+01	6.21356E+01	1.87335E+04	2.15939E+03
1.10000E+01	-4.69246E+00	0.00000E+00	5.73307E+01	6.05558E+01	6.20232E+01	6.12373E+01	1.87276E+04	2.14154E+03
1.20000E+01	-3.94328E+00	0.00000E+00	5.72973E+01	6.03097E+01	6.12406E+01	6.03595E+01	1.87243E+04	2.12357E+03
1.30000E+01	-3.15101E+00	1.00000E+00	5.72447E+01	6.00984E+01	6.03957E+01	5.94298E+01	1.86999E+04	2.10525E+03
1.40000E+01	-3.12263E+00	1.00000E+00	5.63423E+01	6.02605E+01	5.94649E+01	5.83463E+01	1.87524E+04	2.08082E+03
1.50000E+01	-5.54413E+00	1.00000E+00	5.26479E+01	5.80821E+01	5.81920E+01	5.68115E+01	1.88792E+04	2.04772E+03
1.60000E+01	-9.21726E+00	1.00000E+00	4.79643E+01	5.45168E+01	5.71815E+01	5.54904E+01	1.89899E+04	2.00900E+03
1.70000E+01	-1.36155E+01	1.00000E+00	4.24900E+01	4.98977E+01	5.61055E+01	5.40932E+01	1.90579E+04	1.96699E+03
1.80000E+01	-1.75546E+01	1.00000E+00	3.77064E+01	4.54895E+01	5.52610E+01	5.29533E+01	1.90924E+04	1.92342E+03
1.90000E+01	-2.10613E+01	1.00000E+00	3.33769E+01	4.11761E+01	5.44382E+01	5.18737E+01	1.91110E+04	1.87941E+03
2.00000E+01	-2.37864E+01	1.00000E+00	3.00277E+01	3.76065E+01	5.38141E+01	5.10334E+01	1.91245E+04	1.83545E+03
2.10000E+01	-2.59008E+01	1.00000E+00	2.72370E+01	3.44762E+01	5.31378E+01	5.01765E+01	1.87966E+04	1.79169E+03
2.20000E+01	-2.72329E+01	1.00000E+00	2.52957E+01	3.24150E+01	5.25286E+01	4.94018E+01	1.75428E+04	1.74854E+03
2.30000E+01	-2.76954E+01	1.00000E+00	2.40772E+01	3.09974E+01	5.17726E+01	4.84980E+01	1.63510E+04	1.70660E+03
2.40000E+01	-2.76665E+01	1.00000E+00	2.35699E+01	3.02910E+01	5.12364E+01	4.78450E+01	1.53607E+04	1.66594E+03
2.50000E+01	-2.72033E+01	1.00000E+00	2.33689E+01	2.98670E+01	5.05722E+01	4.70980E+01	1.44546E+04	1.62623E+03
2.50801E+01	-2.72103E+01	1.00000E+00	2.33655E+01	2.98530E+01	5.05758E+01	4.70964E+01	1.43892E+04	1.62309E+03

SYSTEM ELAPSED TIME (SEC)	JUN 13 MASS FLOW (LB/SEC)	JUN 100 MASS FLOW (LB/SEC)	JUN 43 MASS FLOW (LB/SEC)	JUN 34 MASS FLOW (LB/SEC)	JUN 190 MASS FLOW (LB/SEC)	JUN 200 MASS FLOW (LB/SEC)	JUN 201 MASS FLOW (LB/SEC)	JUN 290 MASS FLOW (LB/SEC)
0.00000E+00	1.87778E+04	9.35190E+02	9.38890E+03	9.38890E+03	0.00000E+00	1.87038E+03	1.87038E+03	0.00000E+00
1.00000E+00	1.87778E+04	9.34717E+02	9.38884E+03	9.38890E+03	0.00000E+00	1.87062E+03	1.87052E+03	0.00000E+00
2.00000E+00	1.87778E+04	9.34683E+02	9.38886E+03	9.38890E+03	0.00000E+00	1.87074E+03	1.87055E+03	0.00000E+00
3.00000E+00	1.87778E+04	9.34688E+02	9.38882E+03	9.38890E+03	0.00000E+00	1.87081E+03	1.87051E+03	0.00000E+00
4.00000E+00	1.87778E+04	9.34701E+02	9.38881E+03	9.38890E+03	0.00000E+00	1.87085E+03	1.87047E+03	0.00000E+00
5.00000E+00	1.87778E+04	9.34715E+02	9.38878E+03	9.38890E+03	0.00000E+00	1.87089E+03	1.87043E+03	0.00000E+00
6.00000E+00	1.87579E+04	9.34808E+02	9.25947E+03	9.38713E+03	0.00000E+00	1.87092E+03	1.86892E+03	0.00000E+00
7.00000E+00	1.87817E+04	9.34567E+02	9.49152E+03	9.38957E+03	0.00000E+00	1.87117E+03	1.86891E+03	0.00000E+00
8.00000E+00	1.87736E+04	9.33099E+02	9.44624E+03	9.38615E+03	0.00000E+00	1.87263E+03	1.86667E+03	0.00000E+00
9.00000E+00	1.87704E+04	9.29850E+02	9.45327E+03	9.38335E+03	0.00000E+00	1.87586E+03	1.86328E+03	0.00000E+00
1.00000E+01	1.87666E+04	9.25306E+02	9.45204E+03	9.37922E+03	0.00000E+00	1.88040E+03	1.85905E+03	0.00000E+00
1.10000E+01	1.87632E+04	9.20374E+02	9.45488E+03	9.37430E+03	0.00000E+00	1.88535E+03	1.85484E+03	0.00000E+00
1.20000E+01	1.87584E+04	9.15828E+02	9.44849E+03	9.36858E+03	0.00000E+00	1.88992E+03	1.85108E+03	0.00000E+00
1.30000E+01	1.87658E+04	9.12108E+02	9.35734E+03	9.37433E+03	0.00000E+00	1.89368E+03	1.84804E+03	0.00000E+00
1.40000E+01	1.87607E+04	9.09309E+02	8.95691E+03	9.38846E+03	0.00000E+00	1.89657E+03	1.84487E+03	0.00000E+00
1.50000E+01	1.87441E+04	9.06795E+02	8.73347E+03	9.38515E+03	0.00000E+00	1.89922E+03	1.84057E+03	0.00000E+00
1.60000E+01	1.87266E+04	9.03317E+02	8.62469E+03	9.37676E+03	0.00000E+00	1.90310E+03	1.83092E+03	0.00000E+00
1.70000E+01	1.87143E+04	8.98095E+02	8.59394E+03	9.36819E+03	0.00000E+00	1.90901E+03	1.81277E+03	0.00000E+00
1.80000E+01	1.87094E+04	8.91423E+02	8.60244E+03	9.36096E+03	0.00000E+00	1.91675E+03	1.78602E+03	0.00000E+00
1.90000E+01	1.87132E+04	8.84087E+02	8.62753E+03	9.35734E+03	0.00000E+00	1.92480E+03	1.75259E+03	0.00000E+00
2.00000E+01	1.87273E+04	8.77354E+02	8.65772E+03	9.35775E+03	0.00000E+00	1.93248E+03	1.71485E+03	0.00000E+00
2.10000E+01	1.83974E+04	8.71899E+02	8.51999E+03	9.18698E+03	0.00000E+00	1.93864E+03	1.67456E+03	0.00000E+00
2.20000E+01	1.71474E+04	8.68248E+02	7.94753E+03	8.56011E+03	0.00000E+00	1.94274E+03	1.63033E+03	0.00000E+00
2.30000E+01	1.59832E+04	1.24758E+02	7.41616E+03	7.97729E+03	0.00000E+00	2.87976E+02	1.59861E+03	0.00000E+00
2.40000E+01	1.50310E+04	2.41414E-01	6.96866E+03	7.50177E+03	0.00000E+00	4.63652E-01	1.56425E+03	0.00000E+00
2.50000E+01	1.41534E+04	2.63074E-01	6.55303E+03	7.06485E+03	0.00000E+00	5.03685E-01	1.52561E+03	0.00000E+00
2.50801E+01	1.40872E+04	2.71914E-01	6.52269E+03	7.03188E+03	0.00000E+00	5.20085E-01	1.52242E+03	0.00000E+00

SYSTEM	JUN 95	JUN 94	JUN 92	VOL 101	VOL 201	VOL 23	VOL 34	VOL 2
ELAPSED TIME (SEC)	MASS FLOW (LB/SEC)	MASS FLOW (LB/SEC)	MASS FLOW (LB/SEC)	AVG. PRESS. (PSI)	AVG. PRESS. (PSI)	AVG. TEMP. (DEG. F)	AVG. TEMP. (DEG. F)	AVG. TEMP. (DEG. F)
0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	8.30147E+02	8.30094E+02	6.04365E+02	5.46831E+02	6.04365E+02
1.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	8.30137E+02	8.30084E+02	6.04365E+02	5.46831E+02	6.04365E+02
2.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	8.30133E+02	8.30078E+02	6.04365E+02	5.46831E+02	6.04365E+02
3.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	8.30127E+02	8.30071E+02	6.04365E+02	5.46831E+02	6.04365E+02
4.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	8.30121E+02	8.30064E+02	6.04365E+02	5.46830E+02	6.04365E+02
5.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	8.30114E+02	8.30057E+02	6.04365E+02	5.46830E+02	6.04365E+02
6.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	8.29958E+02	8.29905E+02	6.05392E+02	5.46710E+02	6.04202E+02
7.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	8.29970E+02	8.29843E+02	6.06201E+02	5.46614E+02	6.04093E+02
8.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	8.30131E+02	8.29705E+02	6.06931E+02	5.46561E+02	6.04001E+02
9.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	8.30507E+02	8.29577E+02	6.07140E+02	5.46515E+02	6.03898E+02
1.00000E+01	0.00000E+00	0.00000E+00	0.00000E+00	8.30995E+02	8.29466E+02	6.07220E+02	5.46534E+02	6.03809E+02
1.10000E+01	0.00000E+00	0.00000E+00	0.00000E+00	8.31495E+02	8.29384E+02	6.07170E+02	5.46631E+02	6.03732E+02
1.20000E+01	0.00000E+00	0.00000E+00	0.00000E+00	8.31926E+02	8.29320E+02	6.07068E+02	5.46780E+02	6.03658E+02
1.30000E+01	0.00000E+00	0.00000E+00	0.00000E+00	8.32250E+02	8.29266E+02	6.07006E+02	5.46907E+02	6.03527E+02
1.40000E+01	0.00000E+00	0.00000E+00	0.00000E+00	8.32415E+02	8.29142E+02	6.07118E+02	5.46911E+02	6.02275E+02
1.50000E+01	0.00000E+00	0.00000E+00	0.00000E+00	8.32468E+02	8.28859E+02	6.04947E+02	5.46883E+02	5.98556E+02
1.60000E+01	0.00000E+00	0.00000E+00	0.00000E+00	8.32259E+02	8.28097E+02	6.01094E+02	5.46840E+02	5.93412E+02
1.70000E+01	0.00000E+00	0.00000E+00	0.00000E+00	8.31339E+02	8.26391E+02	5.96657E+02	5.46812E+02	5.88062E+02
1.80000E+01	0.00000E+00	0.00000E+00	0.00000E+00	8.29274E+02	8.23410E+02	5.92138E+02	5.46773E+02	5.83010E+02
1.90000E+01	0.00000E+00	0.00000E+00	0.00000E+00	8.25857E+02	8.19094E+02	5.87754E+02	5.46618E+02	5.78384E+02
2.00000E+01	0.00000E+00	0.00000E+00	0.00000E+00	8.21104E+02	8.13574E+02	5.83623E+02	5.46226E+02	5.74196E+02
2.10000E+01	0.00000E+00	0.00000E+00	0.00000E+00	8.15183E+02	8.07084E+02	5.79846E+02	5.45519E+02	5.70431E+02
2.20000E+01	0.00000E+00	0.00000E+00	0.00000E+00	8.08022E+02	7.99615E+02	5.76848E+02	5.44558E+02	5.67264E+02
2.30000E+01	0.00000E+00	0.00000E+00	0.00000E+00	8.00399E+02	7.92003E+02	5.74399E+02	5.43403E+02	5.64782E+02
2.40000E+01	0.00000E+00	0.00000E+00	0.00000E+00	7.93265E+02	7.85145E+02	5.72318E+02	5.42057E+02	5.62760E+02
2.50000E+01	0.00000E+00	0.00000E+00	0.00000E+00	7.85339E+02	7.77541E+02	5.70403E+02	5.40550E+02	5.60979E+02
2.50801E+01	0.00000E+00	0.00000E+00	0.00000E+00	7.84667E+02	7.76898E+02	5.70254E+02	5.40424E+02	5.60842E+02

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SYSTEM ELAPSED TIME (SEC)	VOL 13 AVG. TEMP. (DEG. F)	SYSTEM NORM. POWER	VOL 23 AVG. DENSITY (LB/FT3)	VOL 101 POWR TO H2O (BTU/HR)	VOL 201 POWR TO H2O (BTU/HR)	VOL 101 LIQ. LEVEL (FEET)	VOL 201 LIQ. LEVEL (FEET)	VOL 39 LIQ. LEVEL (FEET)
0.00000E+00	5.46831E+02	1.00000E+00	4.26651E+01	2.63038E+09	5.26076E+09	2.32557E+01	2.32511E+01	2.18400E+01
1.00000E+00	5.46831E+02	1.00000E+00	4.26651E+01	2.63047E+09	5.26098E+09	2.32555E+01	2.32510E+01	2.18400E+01
2.00000E+00	5.46831E+02	1.00000E+00	4.26651E+01	2.63049E+09	5.26102E+09	2.32554E+01	2.32510E+01	2.18399E+01
3.00000E+00	5.46831E+02	1.00000E+00	4.26651E+01	2.63052E+09	5.26109E+09	2.32552E+01	2.32510E+01	2.18398E+01
4.00000E+00	5.46830E+02	1.00000E+00	4.26651E+01	2.63056E+09	5.26116E+09	2.32550E+01	2.32510E+01	2.18397E+01
5.00000E+00	5.46830E+02	1.00000E+00	4.26651E+01	2.63059E+09	5.26124E+09	2.32549E+01	2.32511E+01	2.18396E+01
6.00000E+00	5.46710E+02	1.00000E+00	4.25291E+01	2.62482E+09	5.24680E+09	2.32545E+01	2.32508E+01	2.11396E+01
7.00000E+00	5.46615E+02	1.00000E+00	4.24228E+01	2.63405E+09	5.24166E+09	2.32545E+01	2.32509E+01	2.04212E+01
8.00000E+00	5.46560E+02	1.00000E+00	4.23302E+01	2.65583E+09	5.23509E+09	2.32543E+01	2.32510E+01	1.96986E+01
9.00000E+00	5.46496E+02	1.00000E+00	4.22847E+01	2.67788E+09	5.22817E+09	2.32534E+01	2.32518E+01	1.89907E+01
1.00000E+01	5.46445E+02	1.00000E+00	4.22536E+01	2.69429E+09	5.22217E+09	2.32505E+01	2.32536E+01	1.82865E+01
1.10000E+01	5.46404E+02	1.00000E+00	4.22364E+01	2.70388E+09	5.21656E+09	2.32452E+01	2.32566E+01	1.76192E+01
1.20000E+01	5.46363E+02	1.00000E+00	4.22234E+01	2.70729E+09	5.21049E+09	2.32375E+01	2.32608E+01	1.69570E+01
1.30000E+01	5.46287E+02	2.55033E-01	4.21968E+01	2.70460E+09	5.20259E+09	2.32274E+01	2.32659E+01	1.62910E+01
1.40000E+01	5.46108E+02	7.28364E-02	4.21241E+01	2.69907E+09	5.17943E+09	2.32156E+01	2.32716E+01	1.54185E+01
1.50000E+01	5.45932E+02	5.68274E-02	4.22792E+01	2.69493E+09	5.13899E+09	2.32023E+01	2.32776E+01	1.42644E+01
1.60000E+01	5.45772E+02	5.20655E-02	4.25981E+01	2.66676E+09	5.01099E+09	2.31873E+01	2.32835E+01	1.29546E+01
1.70000E+01	5.45630E+02	4.75018E-02	4.29691E+01	2.60673E+09	4.82518E+09	2.31690E+01	2.32893E+01	1.15796E+01
1.80000E+01	5.45433E+02	4.30901E-02	4.33424E+01	2.50891E+09	4.56198E+09	2.31464E+01	2.32953E+01	1.02021E+01
1.90000E+01	5.45045E+02	3.86783E-02	4.36956E+01	2.41093E+09	4.32258E+09	2.31194E+01	2.33024E+01	8.85834E+00
2.00000E+01	5.44358E+02	3.49969E-02	4.40187E+01	2.27789E+09	4.02242E+09	2.30889E+01	2.33116E+01	7.56167E+00
2.10000E+01	5.43332E+02	3.49779E-02	4.43049E+01	2.16879E+09	3.79190E+09	2.30564E+01	2.33237E+01	6.31486E+00
2.20000E+01	5.42084E+02	3.49590E-02	4.45229E+01	2.02066E+09	3.50542E+09	2.30231E+01	2.33388E+01	5.12705E+00
2.30000E+01	5.40705E+02	3.49401E-02	4.46938E+01	1.86920E+09	3.21650E+09	2.29138E+01	2.32710E+01	4.00894E+00
2.40000E+01	5.39207E+02	3.49211E-02	4.48315E+01	1.75503E+09	2.99960E+09	2.26765E+01	2.30599E+01	2.96140E+00
2.50000E+01	5.37614E+02	3.49022E-02	4.49554E+01	1.65365E+09	2.81465E+09	2.24434E+01	2.28523E+01	1.97346E+00
2.50801E+01	5.37483E+02	3.49007E-02	4.49649E+01	1.62518E+09	2.76301E+09	2.24249E+01	2.28359E+01	1.89687E+00

SYSTEM ELAPSED TIME (SEC)	VOL 14 AVG. TEMP. (DEG. F)	VOL 16 AVG. TEMP. (DEG. F)	VOL 35 AVG. TEMP. (DEG. F)	VOL 37 AVG. TEMP. (DEG. F)	JUN 75 MASS FLOW (LB/SEC)	TRIP 16 TRIP STATUS	JUN 901 MASS FLOW (LB/SEC)	JUN 902 MASS FLOW (LB/SEC)
0.0000E+00	5.46841E+02	5.46863E+02	5.46841E+02	5.46863E+02	0.00000E+00	0.00000E+00	9.35190E+02	1.87038E+03
1.0000E+00	5.46841E+02	5.46863E+02	5.46841E+02	5.46863E+02	0.00000E+00	0.00000E+00	9.35286E+02	1.87055E+03
2.0000E+00	5.46841E+02	5.46863E+02	5.46841E+02	5.46863E+02	0.00000E+00	0.00000E+00	9.35314E+02	1.87057E+03
3.0000E+00	5.46841E+02	5.46863E+02	5.46841E+02	5.46863E+02	0.00000E+00	0.00000E+00	9.35303E+02	1.87052E+03
4.0000E+00	5.46841E+02	5.46863E+02	5.46841E+02	5.46863E+02	0.00000E+00	0.00000E+00	9.35291E+02	1.87048E+03
5.0000E+00	5.46840E+02	5.46863E+02	5.46841E+02	5.46863E+02	0.00000E+00	0.00000E+00	9.35278E+02	1.87044E+03
6.0000E+00	5.46721E+02	5.46744E+02	5.46721E+02	5.46744E+02	9.06004E+02	0.00000E+00	9.34607E+02	1.86926E+03
7.0000E+00	5.46620E+02	5.46639E+02	5.46619E+02	5.46639E+02	8.90788E+02	0.00000E+00	9.35194E+02	1.86910E+03
8.0000E+00	5.46562E+02	5.46571E+02	5.46562E+02	5.46571E+02	8.78643E+02	0.00000E+00	9.37233E+02	1.86687E+03
9.0000E+00	5.46495E+02	5.46497E+02	5.46503E+02	5.46498E+02	8.67750E+02	0.00000E+00	9.41294E+02	1.86339E+03
1.0000E+01	5.46441E+02	5.46438E+02	5.46494E+02	5.46453E+02	8.58196E+02	0.00000E+00	9.46376E+02	1.85908E+03
1.1000E+01	5.46397E+02	5.46388E+02	5.46557E+02	5.46456E+02	8.49693E+02	0.00000E+00	9.51457E+02	1.85482E+03
1.2000E+01	5.46354E+02	5.46341E+02	5.46680E+02	5.46519E+02	8.41111E+02	0.00000E+00	9.55819E+02	1.85105E+03
1.3000E+01	5.46276E+02	5.46260E+02	5.46798E+02	5.46599E+02	8.28513E+02	0.00000E+00	9.59165E+02	1.84805E+03
1.4000E+01	5.46096E+02	5.46076E+02	5.46809E+02	5.46602E+02	8.03267E+02	0.00000E+00	9.61360E+02	1.84513E+03
1.5000E+01	5.45915E+02	5.45890E+02	5.46791E+02	5.46597E+02	7.87419E+02	0.00000E+00	9.63324E+02	1.84132E+03
1.6000E+01	5.45747E+02	5.45709E+02	5.46752E+02	5.46573E+02	7.78835E+02	0.00000E+00	9.65465E+02	1.83306E+03
1.7000E+01	5.45607E+02	5.45560E+02	5.46725E+02	5.46552E+02	7.81116E+02	0.00000E+00	9.66912E+02	1.81739E+03
1.8000E+01	5.45450E+02	5.45431E+02	5.46704E+02	5.46542E+02	7.80413E+02	0.00000E+00	9.66452E+02	1.79384E+03
1.9000E+01	5.45161E+02	5.45261E+02	5.46612E+02	5.46517E+02	7.80135E+02	0.00000E+00	9.62947E+02	1.76358E+03
2.0000E+01	5.44620E+02	5.44944E+02	5.46337E+02	5.46403E+02	7.77131E+02	0.00000E+00	9.55996E+02	1.72874E+03
2.1000E+01	5.43753E+02	5.44373E+02	5.45777E+02	5.46093E+02	7.73489E+02	1.00000E+00	9.45387E+02	1.69079E+03
2.2000E+01	5.42641E+02	5.43545E+02	5.44957E+02	5.45546E+02	7.67208E+02	1.00000E+00	9.30120E+02	1.64906E+03
2.3000E+01	5.41382E+02	5.42534E+02	5.43942E+02	5.44795E+02	7.59976E+02	1.00000E+00	9.15121E+02	1.61540E+03
2.4000E+01	5.40005E+02	5.41388E+02	5.42746E+02	5.43870E+02	7.47835E+02	1.00000E+00	8.95929E+02	1.58178E+03
2.5000E+01	5.38529E+02	5.40141E+02	5.41389E+02	5.42795E+02	7.26483E+02	1.00000E+00	8.74693E+02	1.54466E+03
2.50801E+01	5.38407E+02	5.40037E+02	5.41273E+02	5.42702E+02	7.24753E+02	1.00000E+00	8.72866E+02	1.54149E+03

SYSTEM ELAPSED TIME (SEC)	VOL 901 AVG. PRESS. (PSI)	VOL 902 AVG. PRESS. (PSI)	VOL 23 AVG. PRESS. (PSI)	JUN 200 ENTHALPY (BTU/LB)	JUN 100 ENTHALPY (BTU/LB)	VOL 101 SPEC. ENTH. (BTU/LB)	VOL 201 SPEC. ENTH. (BTU/LB)	VOL 701 AVG. PRESS. (PSI)
0.0000E+00	7.89844E+02	7.89844E+02	2.25714E+03	4.17597E+02	4.17596E+02	5.47270E+02	5.47270E+02	8.36756E+02
1.0000E+00	7.90046E+02	7.90046E+02	2.25713E+03	4.17549E+02	4.17547E+02	5.47268E+02	5.47268E+02	8.36744E+02
2.0000E+00	7.90039E+02	7.90039E+02	2.25713E+03	4.17507E+02	4.17505E+02	5.47268E+02	5.47267E+02	8.36740E+02
3.0000E+00	7.90034E+02	7.90034E+02	2.25713E+03	4.17469E+02	4.17468E+02	5.47267E+02	5.47265E+02	8.36735E+02
4.0000E+00	7.90028E+02	7.90028E+02	2.25713E+03	4.17437E+02	4.17436E+02	5.47266E+02	5.47264E+02	8.36729E+02
5.0000E+00	7.90022E+02	7.90022E+02	2.25713E+03	4.17410E+02	4.17409E+02	5.47265E+02	5.47262E+02	8.36722E+02
6.0000E+00	7.89912E+02	7.89912E+02	2.22756E+03	4.17386E+02	4.17384E+02	5.47234E+02	5.47231E+02	8.36566E+02
7.0000E+00	7.89869E+02	7.89869E+02	2.20594E+03	4.17366E+02	4.17365E+02	5.47236E+02	5.47219E+02	8.36571E+02
8.0000E+00	7.89826E+02	7.89824E+02	2.18972E+03	4.17349E+02	4.17348E+02	5.47270E+02	5.47190E+02	8.36712E+02
9.0000E+00	7.89850E+02	7.89846E+02	2.17015E+03	4.17334E+02	4.17336E+02	5.47350E+02	5.47162E+02	8.37060E+02
1.0000E+01	7.89920E+02	7.89912E+02	2.15192E+03	4.17322E+02	4.17325E+02	5.47457E+02	5.47134E+02	8.37529E+02
1.1000E+01	7.90014E+02	7.90002E+02	2.13439E+03	4.17312E+02	4.17317E+02	5.47573E+02	5.47110E+02	8.38019E+02
1.2000E+01	7.90104E+02	7.90088E+02	2.11613E+03	4.17304E+02	4.17311E+02	5.47680E+02	5.47087E+02	8.38448E+02
1.3000E+01	7.90173E+02	7.90155E+02	2.09029E+03	4.17298E+02	4.17305E+02	5.47770E+02	5.47064E+02	8.38768E+02
1.4000E+01	7.90172E+02	7.90152E+02	2.04244E+03	4.17293E+02	4.17301E+02	5.47832E+02	5.47026E+02	8.38935E+02
1.5000E+01	7.90060E+02	7.90037E+02	1.99201E+03	4.17288E+02	4.17297E+02	5.47874E+02	5.46953E+02	8.38978E+02
1.6000E+01	7.89672E+02	7.89647E+02	1.94089E+03	4.17284E+02	4.17293E+02	5.47866E+02	5.46782E+02	8.38744E+02
1.7000E+01	7.88626E+02	7.88596E+02	1.89252E+03	4.17276E+02	4.17287E+02	5.47719E+02	5.46416E+02	8.37809E+02
1.8000E+01	7.86565E+02	7.86529E+02	1.84778E+03	4.17266E+02	4.17279E+02	5.47346E+02	5.45785E+02	8.35739E+02
1.9000E+01	7.83366E+02	7.83323E+02	1.80489E+03	4.17251E+02	4.17266E+02	5.46702E+02	5.44873E+02	8.32321E+02
2.0000E+01	7.79062E+02	7.79016E+02	1.76309E+03	4.17234E+02	4.17250E+02	5.45787E+02	5.43704E+02	8.27548E+02
2.1000E+01	7.73833E+02	7.73782E+02	1.72225E+03	4.17213E+02	4.17229E+02	5.44629E+02	5.42321E+02	8.21649E+02
2.2000E+01	7.67747E+02	7.67694E+02	1.68483E+03	4.17190E+02	4.17205E+02	5.43207E+02	5.40720E+02	8.14496E+02
2.3000E+01	7.60840E+02	7.60786E+02	1.64944E+03	4.17941E+02	4.17867E+02	5.41856E+02	5.39267E+02	7.73784E+02
2.4000E+01	7.55212E+02	7.55159E+02	1.61313E+03	4.18079E+02	4.17999E+02	5.40899E+02	5.38287E+02	7.99208E+02
2.5000E+01	7.48754E+02	7.48702E+02	1.57794E+03	4.18052E+02	4.17971E+02	5.39757E+02	5.37133E+02	7.91267E+02
2.50801E+01	7.48232E+02	7.48181E+02	1.57495E+03	4.18050E+02	4.17970E+02	5.39657E+02	5.37032E+02	7.90597E+02

SYSTEM ELAPSED TIME (SEC)	VOL 801 AVG. PRESS. (PSI)	JUN 700 MASS FLOW (LB/SEC)	JUN 800 MASS FLOW (LB/SEC)
0.00000E+00	8.36703E+02	9.34744E+02	1.87088E+03
1.00000E+00	8.36692E+02	9.34929E+02	1.87104E+03
2.00000E+00	8.36686E+02	9.34864E+02	1.87110E+03
3.00000E+00	8.36680E+02	9.34843E+02	1.87112E+03
4.00000E+00	8.36673E+02	9.34834E+02	1.87112E+03
5.00000E+00	8.36665E+02	9.34828E+02	1.87112E+03
6.00000E+00	8.36513E+02	9.34903E+02	1.87111E+03
7.00000E+00	8.36456E+02	9.34650E+02	1.87133E+03
8.00000E+00	8.36329E+02	9.33177E+02	1.87276E+03
9.00000E+00	8.36213E+02	9.29922E+02	1.87597E+03
1.00000E+01	8.36111E+02	9.25370E+02	1.88049E+03
1.10000E+01	8.36034E+02	9.20429E+02	1.88542E+03
1.20000E+01	8.35972E+02	9.15873E+02	1.88998E+03
1.30000E+01	8.35919E+02	9.12136E+02	1.89373E+03
1.40000E+01	8.35794E+02	9.09333E+02	1.89659E+03
1.50000E+01	8.35522E+02	9.06812E+02	1.89926E+03
1.60000E+01	8.34776E+02	9.03314E+02	1.90305E+03
1.70000E+01	8.33113E+02	8.98107E+02	1.90902E+03
1.80000E+01	8.30172E+02	8.91382E+02	1.91662E+03
1.90000E+01	8.25889E+02	8.84105E+02	1.92481E+03
2.00000E+01	8.20358E+02	8.77193E+02	1.93210E+03
2.10000E+01	8.13893E+02	8.71706E+02	1.93821E+03
2.20000E+01	8.06423E+02	8.67995E+02	1.94221E+03
2.30000E+01	7.65503E+02	0.00000E+00	0.00000E+00
2.40000E+01	7.91269E+02	0.00000E+00	0.00000E+00
2.50000E+01	7.83662E+02	0.00000E+00	0.00000E+00
2.50801E+01	7.83021E+02	0.00000E+00	0.00000E+00

TIMING EDIT ACCUMULATED TIME = 59.896 SECONDS

SUBROUTINE	CPU TIME (SEC)	PERCENT	NUMBER OF CALLS
* STSTAT	2.604	4.35	1
* TRAN	57.292	95.65	1
* TSTP	2.604	4.35	621
* ADVFLO	10.417	17.39	632
DIRSOL	13.021	21.74	3726
* CONTRL	18.229	30.43	29822
* PRESUR	10.417	17.39	622
STATEW	10.417	17.39	28612
* ENERGY	15.625	26.09	2502
* JUNPRP	7.813	13.04	634

* INDICATES OUTER LOOP TIME

TIME STEP CONTROL SUMMARY FOR 1 ACTUAL TIME STEPS. THE AVERAGE TIME STEP SIZE FOR THE INTERVAL WAS 8.005140E-02 SECONDS.

NUMBER OF TIMES EACH TEST CONTROLLED TIME STEP SIZE

UPPER LIMIT	LOWER LIMIT	PRESSURE CHANGE	MASS CHANGE	ENERGY CHANGE	COURANT LIMIT	SAT LINE CROSSING	AIR MASS CHANGE	ZERO FLOW CROSSING	TRIP ACTUATION
0	0	0	0	0	1	0	0	0	0

VOLUMES CONTROLLING COURANT LIMIT
 (VOLUME INDEX ; TIMES CONTROLLING)

131; 1

PROBLEM END TRIP SIGNAL.

TIMING EDIT ACCUMULATED TIME = 59.896 SECONDS

SUBROUTINE	CPU TIME (SEC)	PERCENT	NUMBER OF CALLS
*****	*****	*****	*****
* STSTAT	2.604	4.35	1
* TRAN	57.292	95.65	1
* TSTP	2.604	4.35	621
* ADVFLO	10.417	17.39	632
DIRSOL	13.021	21.74	3726
* CONTRL	18.229	30.43	29822
* PRESUR	10.417	17.39	622
STATEW	10.417	17.39	28612
* ENERGY	15.625	26.09	2502
* JUNPRP	7.813	13.04	634
* INDICATES OUTER LOOP TIME			

 * TRIP SUMMARY *

TIME (SEC)	TRP ID	ACTION	REASON	SET POINT	DELAY (SEC)	IX1	IX2
0.000000E+00	3	GEN TRIP ON	ELAPSED TIME OF	0.000000E+00	0.000000E+00	0	0
	4	GEN TRIP ON	ELAPSED TIME OF	0.000000E+00	0.000000E+00	0	0
	9	GEN TRIP ON	ELAPSED TIME OF	0.000000E+00	0.000000E+00	0	0
	10	GEN TRIP ON	ELAPSED TIME OF	0.000000E+00	0.000000E+00	0	0
5.010000E+00	15	GEN TRIP ON	ELAPSED TIME OF	1.000000E-02	5.000000E+00	0	0
1.213375E+01	30	GEN TRIP ON	HIGH OUTPUT OF	0.000000E+00	0.000000E+00	-26	0
2.055811E+01	16	GEN TRIP ON	LOW PRESSURE OF	1.859000E+03	1.000000E+00	39	0
2.263470E+01	3	RST TRIP ON	INDIRECT TRP OF	0.000000E+00	2.000000E+00	16	0
	4	RST TRIP ON	INDIRECT TRP OF	0.000000E+00	2.000000E+00	16	0
	9	RST TRIP ON	INDIRECT TRP OF	0.000000E+00	2.000000E+00	16	0
	10	RST TRIP ON	INDIRECT TRP OF	0.000000E+00	2.000000E+00	16	0
2.508005E+01	1	END PROB ON	ELAPSED TIME OF	2.500000E+01	0.000000E+00	0	0

* END SUMMARY *

REFERENCES

1. "RETRAN-02 - A Program for Transient Thermal-Hydraulic Analysis of Complex Fluid Flow Systems," Vol. 1, EPRI NP-1850, May 1981.
2. G. J. Van Tuyle, T. C. Nepssee and J. G. Guppy, "MINET Code Documentation," Brookhaven National Laboratory Report, NUREG/CR-3668, BNL-NUREG-51742, February 1984.
3. J. E. Meyer, "Hydrodynamic Models for the Treatment of Reactor Thermal Transients," Nucl. Sci. Engrg. 10 (1961) 269.
4. G. J. Van Tuyle, "A Momentum Integral Network Method for Thermal-Hydraulic Systems Analysis," Nuclear Engineering and Design, 91, 1986, pp. 17-28.
5. C. D. Fletcher, et al., "RELAP5 Thermal-Hydraulic Analyses of Pressurized Thermal Shock Sequences for the H. B. Robinson Unit 2 Pressurized Water Reactor," EG&G Idaho, Inc. Report, EGG-SAAM-6476, December 1983.
6. C. E. Peterson, et al., "Analysis of a Hot Leg SBLOCA in a Three-Loop Westinghouse PWR Plant," EPRI Report, NSAC-68, April 1984.

A P P E N D I X A
R E T R A N F I L L B . C . S .

How RETRAN Handles the Time Dependent Fill Boundary Conditions

RETRAN reads the Time Dependent Fill Boundary Conditions (FILL) and stores these tables in a subset of an array identified as FILID(14). The tables in FILID(14) have a rather complicated form and will not be discussed here. The user inputs the RETRAN Fill tables as shown below:

NFILL = Number of Sets of data in User input Fill Table
ITFILL = Trip Number Controlling Fill

JX = Independent Variable Type
Only (0=TIME) allowed for Junction
connected to a MINET node

JY = Dependent Variable Type (0=LB/SEC,1=GALL/MIN)
Only (0=LB/SEC) allowed for Junction
connected to a MINET node

Time (1) (Sec.)
Flow/A (1) (Lbm/Sec/Ft**2)
Enthalpy(1) (Btu/Lbm)
Pressure(1) (P.S.I.A.)

:
:
Time (NFILL) (Sec.)
Flow/A (NFILL) (Lbm/Sec/Ft**2)
Enthalpy(NFILL) (Btu/Lbm)
Pressure(NFILL) (P.S.I.A.)

and these tables are re-arranged by the RETRAN input processor and the data is stored in RETRAN FILID(14).

The RETRAN Function FILL is called for every fill junction during the Steady State Calculation, as well as at every time step during the Transient Calculation. Function FILL interpolates in the Fill that have been stored in the FILID(14) tables to obtain flow, pressure and enthalpy for positive fills and flow for negative fills. Fluid state properties are also obtained for positive fills via calls to the WAT routines. FILL is called by subroutines ADVFLO, BUBINT, INITLZ, JUNPRP and RESOPT.

RETRAN Function FILL stores its results in an internal memory file identified as a Junction Quantities File named FILID(06).

The user input variables are stored in locations (05), (23), and (30).

The Junction Quantities in FILID(06) that come from the user input Fill Boundary Condition are words (05), (23), and (30) of the RETRAN variable list for FILID(06) and are shown in the figure below.

RETRAN uses these Junction input parameters as one set of boundary conditions to the Steady State calculation option as well as for the Transient calculation option. During the transient calculation option, as the time step is advanced, new Junction data is extracted from user input data stored in FILID(14) and this data is written as Junction Quantities in FILID(05).

*** FILID(06 = DJUNCT - JUNCTION QUANTITIES
*** FILE DJUNCT HAS NJUN DATA SETS. A DATA SET IS SHOWN BELOW
*** FILE 6 IS RESERVED IN SUBROUTINE INJUN

WORD
(01) = IW1 = VOLUME NUMBER AT JUNCTION INLET
(02) = IW2 = VOLUME NUMBER AT JUNCTION OUTLET
(03) = IPUMP = PUMP CURVE NUMBER
(04) = IVALVE = VALVE NUMBER
(05) = WP = JUNCTION WEIGHT FLOW
(06) = AJUN = JUNCTION FLOW AREA
(07) = ZJUN = JUNCTION ELEVATION
(08) = INERTA = JUNCTION INERTIA
(09) = FJUNF = SPECIFIC ENERGY LOSS COEFFICIENT FOR FORWARD FLOW
(10) = FJUNR = SPECIFIC ENERGY LOSS COEFFICIENT FOR REVERSE FLOW
(11) = JVERTL = VERTICAL JUNCTION CONTROL INDEX
(12) = JCHOK = JUNCTION CHOKING INDEX
(13) = JCALCI = INITIAL CONDITION CALCULATION TYPE CONTROL INDEX
(14) = MVMIX = MOMENTUM MIXING INDEX
(15) = DIAMJ = JUNCTION DIAMETER
(16) = CONCO = CONTRACTION COEFFICIENT
(17) = IFRJ = FLOW REGIME INDEX
(18) = IHQCOR = ENTHALPY TRANSPORT INDEX
(19) = DELA = PRESSURE DIFFERENTIAL - ACCELERATION
(20) = DELE = PRESSURE DIFFERENTIAL - ELEVATION
(21) = DELF = PRESSURE DIFFERENTIAL - FRICTION
(22) = XP = JUNCTION QUALITY
(23) = HP = JUNCTION FLUID ENTHALPY
(24) = ITP = CHOKING TYPE INDICATOR
(25) = PUMPP = PUMP HEAD
(26) = FMFRAC = MASS FRACTION OF WATER IN JUNCTION FLOW
(27) = DELP = PRESSURE DIFFERENTIAL - VOLUME TO VOLUME
(28) = SPVJ = JUNCTION SPECIFIC VOLUME
(29) = AJUNT = TIME DEPENDENT JUNCTION FLOW AREA
(30) = PJUN = JUNCTION PRESSURE
(31) = CHKVK = CHECK VALVE FRICTION FACTOR
(32) = IJ = MIXING JUNCTION NUMBER
(33) = IK = MIXING VOLUME NUMBER
(34) = PSTAR1 = UNMIXED PRESSURE AT JUNCTION OUTLET
(35) = PSTAR2 = UNMIXED PRESSURE AT JUNCTION INLET
(36) = HEADR1 = HEAD TERM FOR JUNCTION INLET
(37) = HEADR2 = HEAD TERM FOR JUNCTION OUTLET
(38) = FANINJ = FANNING FRICTION AT JUNCTION
(39) = IEQTYP = MOMENTUM EQUATION OPTION
(40) = BWSQR1 = COEFFICIENT OF WJ^{**2} FOR DERIVATIVE CALCULATION
(41) = BWSQR2 = FANNING FRICTION
(42) = AVEDJ = AVERAGE JUNCTION DENSITY
(43) = VOID = JUNCTION VOID FRACTION
(44) = HLPZRZ = LIQUID ENTHALPY AT PRESSURIZER
(45) = HKIN = JUNCTION KINETIC ENERGY
(46) = PUMPK = FORM LOSS COEFFICIENT
(47) = SPVJO = PREVIOUS TIME STEP JUNCTION SPECIFIC VOLUME
(48) = HSPIN = JUNCTION INLET STAGNATION ENTHALPY
(49) = HSPOUT = JUNCTION OUTLET STAGNATION ENTHALPY

(50) = TEMPJ = JUNCTION TEMPERATURE
(51) = ANGLJ = JUNCTION ANGLE
(52) = WOLD = OLD FLOW
(53) = ISP = SPRAY INDEX
(54) = JTPMJ = JUNCTION FRICTION OPTION
(55) = JTPRJ = POINTER FOR TABLE INTERPOLATION
(56) = JTX1J = POINTER FOR TABLE INTERPOLATION
(57) = JTX2J = POINTER FOR TABLE INTERPOLATION
(58) = FSUBK = FRICTION TERM K/RHO FOR MOMENTUM EQUATION
(59) = ESUBK = DW/DT MOMENTUM EQUATION
(60) = XIK1 = WEIGHTING FACTOR MOMENTUM FLUX CALCULATION
(61) = XIK2 = WEIGHTING FACTOR MOMENTUM FLUX CALCULATION
(62) = XIL1 = WEIGHTING FACTOR MOMENTUM FLUX CALCULATION
(63) = XIL2 = WEIGHTING FACTOR MOMENTUM FLUX CALCULATION
(64) = IW1N = NEW VOLUME NUMBER AT JUNCTION INLET
(65) = IW2N = NEW VOLUME NUMBER AT JUNCTION OUTLET
(66) = IPUMPN = NEW PUMP CURVE NUMBER
(67) = OLJUNN = OLD JUNCTION NUMBER
(68) = HOLDA = OLD JUNCTION ENTHALPY SAVE ARRAY
(69) = HKOLD = OLD JUNCTION KINETIC ENERGY
(70) = IDW = DONOR CELL INDEX
(71) = WVOLKD = MOMENTUM COMPONENT USED IN VECTOR CALCULATION
(72) = WVOLKU = MOMENTUM COMPONENT USED IN VECTOR CALCULATION
(73) = WVOLLD = MOMENTUM COMPONENT USED IN VECTOR CALCULATION
(74) = WVOLLU = MOMENTUM COMPONENT USED IN VECTOR CALCULATION
(75) = IDFWD = ID OF CONT. BLOCK DEFINING FORWARD LOSS COEFF.
(76) = IDREV = ID OF CONT. BLOCK DEFINING REVERSE LOSS COEFF.
(77) = VGASJ = JUNCTION GAS VELOCITY
(78) = VGASJO = OLD JUNCTION GAS VELOCITY
(79) = VSLPJ = JUNCTION SLIP VELOCITY
(80) = VSLPJO = OLD JUNCTION SLIP VELOCITY
(81) = WGJ = GAS FLOW
(82) = WLJ = LIQUID FLOW
(83) = ALFRHO = PARTIAL DENSITY OF GAS
(84) = ALFROL = PARTIAL DENSITY OF LIQUID
(85) = HPL = JUNCTION LIQUID ENTHALPY
(86) = HPG = JUNCTION GAS ENTHALPY
(87) = SPVJL = JUNCTION SPECIFIC VOLUME OF LIQUID
(88) = SPVLG = JUNCTION SPECIFIC VOLUME OF GAS
(89) = SLPENV = ENERGY CONVECTION DUE TO UNEQUAL PHASE VELOCITIES
(90) = HPFLOW = FLOWING JUNCTION ENTHALPY

A P P E N D I X B
R E T R A N T D V B . C . S .

How RETRAN Handles the Time Dependent Volume Boundary Conditions

RETRAN reads the Time Dependent Volume Boundary Conditions (TDV) and stores these tables in a subset of an array called FILID(33). These tables have the form as follows:

IRIN		Number of Data Points in this Subset of FILID(33)	
TIMTBL(1)	Time	(Sec.)	(First Set of Values)
PTABLE (1)	Pressure	(P.S.I.A)	
TTABLE (1)	Temperature	(Degree F)	
XTABL (1)	Mix Quality	()	
ZTABL (1)	Mix Level	(Ft)	
:			
:			
TIMTBL (IRIN)	Time	(Sec.)	(Last Set of Values)
PTABLE (IRIN)	Pressure	(P.S.I.A)	
TTABL (IRIN)	Temperature	(Degree F)	
XTABL (IRIN)	Mix Quality	()	
ZTABL (IRIN)	Mix Level	(Ft)	

These tables are interpolated (or extrapolated) in RETRAN subroutine CARDBC. Subroutine CARDBC obtains thermodynamic boundary conditions from the tabular input in FILID(33) for the time dependent volumes. CARDBC is called by RETRAN subroutine INVOL, PRESUR AND RESOPT. Subroutine CARDBC stores the interpolated values in the RETRAN array identified as Volume Quantities array FILID(05).

The volume quantities in FILID(05) that come from the user input Time Dependent Volume B.C. are words (03), (04), (08), and (28) of the RETRAN variable list for FILID(05) and are shown below.

RETRAN uses these volume input parameters as one set of boundary conditions to the Steady State calculation option as well as for the Transient calculation option. During the transient calculation option, as the time step is advanced, new Time Dependent Volume data is extracted from user input data FILID(33) and this data is written to the volume quantities FILID(05).

*** FILID(05) = VOLUME - VOLUME QUANTITIES
*** FILE VOLUME HAS NVOL DATA SETS. A DATA SET IS SHOWN BELOW
*** NOTE THAT THERE ARE 3 POSSIBLE SET SIZES DEPENDING ON OPTIONS
*** FILE 5 IS RESERVED IN SUBROUTINE INVOL

WORD	VARIABLE
(01) = IBUB	= BUBBLE DATA INDEX
(02) = IREAD	= VOLUME DATA RETRIEVAL INDEX
(03) = P	= VOLUME PRESSURE
(04) = TEMP	= VOLUME TEMPERATURE
(05) = HUM	= VOLUME HUMIDITY
(06) = V	= VOLUME (FT3)
(07) = ZVOL	= VOLUME HEIGHT
(08) = ZM	= MIXTURE LEVEL
(09) = FLOWL	= VOLUME FLOW LENGTH
(10) = FLOWA	= VOLUME FLOW AREA
(11) = DIAMV	= EQUIVALENT DIAMETER OF FLOW AREA

(12) = ELEV = ELEVATION AT THE BOTTOM OF THE VOLUME
 (13) = SATP = SATURATION PRESSURE
 (14) = SATT = SATURATION TEMPERATURE
 (15) = SATVF = SATURATION SPECIFIC VOLUME OF LIQUID
 (16) = SATVG = SATURATION SPECIFIC VOLUME OF GAS
 (17) = SATUF = SATURATED LIQUID SPECIFIC INTERNAL ENERGY
 (18) = SATUG = SATURATED GAS SPECIFIC INTERNAL ENERGY
 (19) = SATHF = SPECIFIC ENTHALPY OF SATURATED LIQUID
 (20) = SATHG = SPECIFIC ENTHALPY OF SATURATED GAS
 (21) = VL = LIQUID SPECIFIC VOLUME
 (22) = VS = VAPOR SPECIFIC VOLUME
 (23) = UW = INTERNAL SPECIFIC ENERGY
 (24) = HW = VOLUME SPECIFIC ENTHALPY
 (25) = GASH = GAS SPECIFIC ENTHALPY
 (26) = LIQH = LIQUID SPECIFIC ENTHALPY
 (27) = ZL = LIQUID LEVEL
 (28) = AVEX = AVERAGE QUALITY
 (29) = ZMO = MIXTURE LEVEL FOR PREVIOUS TIME STEP
 (30) = GASM = GAS MASS (INCLUDES BUBBLE MASS)
 (31) = FMASS = TOTAL WATER MASS
 (32) = ARMASS = AIR MASS
 (33) = BUBM = BUBBLE MASS
 (34) = LIQM = LIQUID MASS
 (35) = MIXV = MIXTURE VOLUME
 (36) = GASV = GAS VOLUME
 (37) = LIQV = LIQUID VOLUME
 (38) = AVED = AVERAGE DENSITY
 (39) = U = TOTAL INTERNAL ENERGY
 (40) = MIXQ = MIXTURE QUALITY
 (41) = A = VOLUME AREA
 (42) = IFAN = FANNING FRICTION FACTOR TABLE MEMORY INDEX
 (43) = FLOWRA = $1/(144*GC*FLOWA**2)$
 (44) = WVBAR = AVERAGE VOLUME FLOW (LBM/SEC)
 (45) = WVBARO = PREVIOUS TIME STEP VALUE OF WVBAR
 (46) = SPVZ = VOLUME AVERAGE SPECIFIC VOLUME (FT³/LMB)
 (47) = HKVOL = VOLUME KINETIC ENERGY
 (48) = AINERV = HALF-VOLUME INERTIA ($L/2*A*144*GC$)
 (49) = CMAS = CENTER OF MASS HEIGHT
 (50) = WQ = HEAT ADDITION TO FLUID (BTU/HR)
 (51) = ELOD = $(L/D)/(144*GC*A**2)$
 (52) = QSPL = ENERGY EQUATION SOURCE TERM (BTU/SEC)
 (53) = QSPLO = PREVIOUS TIME STEP VALUE OF QSPL
 (54) = PHASE = VOLUME PHASE INDEX
 (55) = IIN = PRIMARY INLET JUNCTION NUMBER
 (56) = IOUT = PRIMARY OUTLET JUNCTION NUMBER
 (57) = CSUBP = MIXTURE HEAT CAPACITY
 (58) = CSUBPF = SATURATED LIQUID HEAT CAPACITY
 (59) = CSUBPG = SATURATED VAPOR HEAT CAPACITY
 (60) = IQIN = HEAT EXCHANGER CALCULATION INDEX (NON-COND)
 (61) = A1 = SLOPE OF GAS BUBBLE DENSITY
 (62) = B = INTERCEPT OF GAS BUBBLE DENSITY
 (63) = E = SLOPE OF MIXTURE DENSITY
 (64) = F = INTERCEPT OF MIXTURE DENSITY
 (65) = DZMDT = TIME RATE OF CHANGE OF THE MIXTURE LEVEL