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RELAP5コードにおけるジェットポンプモデルの性能評価

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RELAP 5コード用に原研で開発されたジェットポンプモデルを改良し，ROSA－Ⅲ実験を対象とした解析を行い，モデルの性能を評価した。本モデルは，ROSA－Ⅲジェットポンプを流れる水単相定常流のみならず，破断実験におけるジェットポンプの過渡的流れの解析にも適用することができる。従来便宜的に使用してきたジェットポンプ入口の小ポンプモデルに比べ，本モデルはジェットポンプ特性を精度よく計算することができる。またこのことにより，破断初期の圧力容器内冷却材インベントリと炉心の熱伝達現象の予測精度を上げることができることを明らかにした。本モデルを5ホールノズルを持つＢＷＲジェットポンプに適用する場合には，その駆動ノズルの周囲を流れる複雑な吸込流れを考慮した形状データを使用することが必要である。

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Evaluation of a Jet Pump Model for RELAP5 Code

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The report presents the results of revision and evaluation of the JAERI Jet Pump Model which has been developed for RELAP5 code. Analyses for the ROSA-III experiments were performed by the RELAP5 code with the Jet Pump Model. The model can solve not only the single phase steady water flows but also the transient flows through the ROSA-III jet pumps. The JAERI Jet Pump Model can predict the jet pump characteristics more accurately than the small pump model used for convenience to drive the suction flow. And therefore, the JAERI Jet Pump Model is useful to calculate accurately the mass inventory in each region and heat transfer in core. The model for the BWR jet pump analyses, however, needs appropriate geometrical data which represent the complicated suction flow paths around the 5 holes drive nozzle.

Keywords; BWR, LOCA, RELAP5 code, Jet-Pump Model, Single-Phase Steady Flow, Model Evaluation, ROSA-III.

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1. 緒　　言

沸とう水型原子炉（BWR）の冷却系[1]には，再循環ポンプとともにジェットポンプを併用しているものが多い。このジェットポンプは圧力容器内ダウンカマーに設置され，通常のポンプに比べて単純かつ故障が少ないという利点を持つ。また，全流量の約 1／3 の駆動流が圧力容器外の再循環ループを流れるということから，圧力容器外の配管破断による冷却材喪失事故（LOCA）を想定する際にも配管の最大破断口径を小さくすることができる等の利点も持つものである。ジェットポンプの原理[2]は，高速の駆動流を吹き出してスロート部を低圧にし，スロート部と吸込部との圧力差によって駆動流より多い吸込流を流すものである。この特性を表わすものに，吸込流量と駆動流量の比（M値）および駆動流の全水頭損失分と吸込流の全水頭増加分の比（N値）があり，ポンプ効率は両者の積（M×N）で与えられる。

このジェットポンプの特性をモデル化することはBWRの冷却材流れを解析する場合には不可欠なものであるが，RELAP 5／MOD 1コード[3]にはこのモデルがなく，これまでの解析においては，ジェットポンプ吸込部を小さな遠心ポンプで置きかえる便宜的な方法（これを小ポンプモデルと呼ぶ）[4]がとられてきた。岡崎らは，ROSA－Ⅲ装置[5]のジェットポンプ[6]を対象とした定常流下のジェットポンプモデル[7]を開発した。ここではこれを原研ジェットポンプモデルと呼ぶ。本報は，RELAP 5／MOD 1（CY 1）コードに組み込んだこのモデルについて，ROSA－Ⅲ実験解析に適用する上で実施したいくつかの改良点を含め，モデルの特徴と使用上の留意点，およびモデルの評価結果をまとめたものである。改良点は，(1)複数個のジェットポンプを扱えるようにしたこと，(2)計算上の不安定性を解消したこと，(3)リスタート計算，および(4)プロット出力を可能にしたこと等である。

本報では，第2章に本モデルの特徴，使用上の留意点を，第3章にROSA－Ⅲ実験データを用いて行なった定常流ジェットポンプ特性および大，小破断実験時の過渡変化についてのモデルの性能評価結果を示す。また，BWR／6のジェットポンプは，駆動ノズルが5つあるという複雑な形状を持つが，本モデルをこの実機のジェットポンプに適用した結果についても第3章に示した。

2. 原研ジェットポンプモデルの特徴

以下に，RELAP 5コード用に原研で開発されたジェットポンプモデルの特徴と基礎式の概要，その解法について述べる。基礎式の詳細については文献(7)を参照されたい。

2.1 モデルの概要および改良点

RELAP 5コードは，流体とそれを囲むバウンダリを適当な領域に区分し，それらの領域間における一次元的な質量と運動量，エネルギーの輸送現象を解くものである。ところでBWRやそれを模擬したROSA－Ⅲ等の実験装置で使用されているジェットポンプでは，一次元的な配管内の流れと異なり，駆動流と吸込流の運動量交換が流れを特徴づけるメカニズムである。この流れを計算するためには運動量保存則を厳密に解くことが必要である。そのためには，駆動流と吸込流，およびそれらの合流した吐出流について，高さと流路形状の変化による運動量の変化や摩擦項を取り入れ，流速と圧力の変化を正確に計算できることが必要となる。

本モデルは，ジェットポンプのスロート近傍における単相・正流条件下の駆動流，吸込流，吐出流それぞれについて，流路形状の詳細なデータ，および管壁と流れ間の摩擦係数を入力データとして与え，運動量の変化を正確に求めることによりジェットポンプの流れを計算するものである。本モデルの基礎式は次節に示すように，ジェットポンプの定常流を計算するものであるが，境界条件としての周辺領域の圧力と流量の変化に対応して解を求めるものであるので，モデルとしてはLOCA等の過渡状態において，ジェットポンプ流れの時間変化が準定常とみなせる場合にも適用することができる。但し，過渡状態において，ジェットポンプの単相定常流の範囲からはずれた場合（例えば吸込流が逆流になる場合や，吸込部が低圧になり気泡が生成される場合）には，本モデルは使用されなくなり，以後，本モデルの代わりにRELAP 5コードのブランチモデルが同じ領域に対して使用され，過渡状態の計算が続行されるようになる。定常流条件下のジェットポンプ特性と，過渡状態のジェットポンプ流れについての本モデルの適用性は次章に述べてある。

なお，実際に本モデルをRELAP 5／MOD 1コードに組み込みROSA－Ⅲ実験解析を行ったところ，次の改良すべき点があることがわかった。

(1) 複数個のジェットポンプを扱えない。
(2) ジェットポンプでの計算結果の変化量が大きいため，RELAP 5コードの解の安定性に悪影響を及ぼす。
(3) 非定常計算時の吐出流量が過大評価となる。
(4) リスタート計算を行えない。
(5) プロット出力ができない。

これらの問題点について，付録2－Aに示すような機能拡張と安定化を行い，問題点を解決した。次章に示す解析はいずれもこの改良したジェットポンプモデルを使用した解析である。改良

したモデルは付録2－Bを参照されたい。

2.2 基礎式の構成

本モデルでは，ROSA－Ⅲ装置のジェットポンプ（Figs. 3.1，3.2を参照）を対象として，図2.1に示すような領域分割を設定する。すなわち，①の状態は駆動流と吸込流の上流側の状態，②は駆動流と吸込流の接触する直前の位置，③は2つの流れが混合開始するスロート上端の位置，④はスロート下端，⑤はディフューザー出口部である。①と②の間の領域と②と③の間の領域及び③と④の間の領域においては，駆動流と吸込流の2つの流れを考え④と⑤の間の領域ではそれらの流れが完全に混合したと仮定し1つの吐出流が存在するものとする。

今，ジェットポンプを流れている駆動流，吸込流および吐出流が図2.1に示すような流れ方向（正流）で定常状態にあり，水単相流が流れているとする。この状態における質量保存式と運動量保存式をそれぞれの流れに対して求める。以下の式で，P，W，U，ρ，A，d，ℓ，λ，gはそれぞれ圧力，質量流量，流速，密度，流路面積，等価流路直径，高さ，摩擦係数，重力加速度を表わし，添字0－6は図2.1に示す①～⑤の位置における流れの状態を示す。添字f，Hはそれぞれ摩擦，位置差による圧力変化を，添字D，Sはそれぞれ駆動流，吸込流を示す。また，zはそれぞれの領域における軸方向の距離を示し，添字zは距離zの位置における物理量を示す。なお，対象とする流体は水単相流でありほとんど非圧縮性と考えうるので，各領域における密度変化を無視し，一定値ρを用いる。

(a) ①②間の駆動流

①②間の駆動流について質量保存式と運動保存式をつくると次式のようになる。

$$\rho_1 A_1 U_1 = \rho_2 A_2 U_2 = \rho_z A_z U_z = W_D \tag{1}$$

$$A_z (dP + dP_f + dP_H) + W_D dU_z = 0 \tag{2}$$

(2)式は，駆動ノズル内で流路面積が変化する位置①から流れの方向を向いた軸上の距離zとz＋dz間における運動量の平衡を示すものである。ここに第2項，第3項はそれぞれ管壁との摩擦圧損，位置差による圧力変化を示し，第4項は流速の変化による項であり，$\rho_1 = \rho_2 = \rho_z = \rho$とすると，

$$dP_f = \lambda_n \frac{1}{d_z} \frac{\rho}{2} U_z^2 \, dz \tag{3}$$

$$dP_H = -\rho g \, dz \ . \tag{4}$$

λ_nは管壁との摩擦係数である。駆動ノズル内の流速U_zと管径d_zはROSA－Ⅲの駆動ノズルの場合に

$$U_z = \frac{A_1}{A_z} U_1 \tag{5}$$

$$A_1 = (\pi d_1^2 / 4), \quad A_z = (\pi d_z^2 / 4) \tag{6}$$

$$d_z = d_1 (1 - C_1 y) \tag{7}$$

$$y = z / \ell_1, \quad C_1 = 1 - (d_2 / d_1) \tag{8}$$

と表わせる。(3)～(8)式を用いて(2)式を$z = 0 \sim \ell_1$まで積分し，次式が得られる。

$$P_2 - P_1 + B_A U_1^2 - B_B = 0 \tag{9}$$

$$B_A = \lambda_n \frac{\rho}{2} \frac{\ell_1}{d_1} B_1 + \frac{\rho}{2} B_2 \tag{10}$$

$$B_B = \rho g \ell_1 \tag{11}$$

ここにB_1 B_2は形状に関する定数であり次のように表わされる。

$$B_1 = \frac{1}{4 C_1} \left\{ \frac{1}{(1 - C_1)^4} - 1 \right\} \tag{12}$$

$$B_2 = \frac{1}{(1 - C_1)^4} - 1 \tag{13}$$

なお，詳しくは参考文献(7)を参照されたい。

(b) ②③間の駆動流

ROSA－Ⅲのジェットポンプでは，②③間距離ℓ_2は17 mmであり，ℓ_1（38 mm）やℓ_3（100 mm）に比べてかなり小さい。そこで②③間の駆動流と吸込流は完全に混合していない領域と考え，③では駆動流と吸込流がそれぞれU_{4D}，U_{4S}を持つとする。駆動流と吸込流に図2.1に破線で示すような境界を考える。そして，②と③では断面内の圧力分布はないものと仮定する（$P_2 = P_3$）。一方，駆動流がノズル先端から噴出した際に直ちに吸込流に接触するものと考え，噴出の際の圧力損失は無視する。

②③間で，②より距離zとz＋dzの間における質量保存式，運動量保存式を作ると次式になる。なお，②③間の流路形状は直線的に変化しているものとする。

$$\rho_2 A_2 U_2 = \rho_4 A_{4D} U_{4D} = \rho A_{DZ} U_{DZ} = W_D \tag{14}$$

$$A_{DZ} (dP + dP_I + dP_H) + W_D dU_{DZ} = 0 \tag{15}$$

$$\left.\begin{aligned} A_{DZ} &= \pi d_{DZ}^2 / 4 \\ A_{SZ} &= \pi (d_{SZ}^2 - d_{DZ}^2) / 4 \\ d_{DZ} &= d_2 + (d_{4D} - d_2) z / \ell_2 \\ d_{SZ} &= d_3 \left\{ 1 + \left(\frac{d_4}{d_3} - 1 \right) \frac{z}{\ell_2} \right\} \end{aligned}\right\} \tag{16}$$

ここで，(15) 式第2項（$dF_I \equiv A_{DZ} \cdot dP_I$ はdz 間で吸込側流体との間で生じる摩擦力であり次のように表わせるものとする。

$$dP_I = \lambda_I \frac{\rho}{2} \frac{1}{d_{DZ}} (U_{DZ} - U_{SZ})^2 dz \tag{17}$$

λ_I は流れ間の摩擦係数である。(15) 式第3項（$A_{DZ} \cdot dP_H$）は(4)と同形である。これらの関係式を用いて，(15) 式を $z = 0 \sim \ell_2$ まで積分して次式が得られる。

$$P_4 - P_2 + F_1 + F_2 U_3 + F_3 U_3^2 = 0 \tag{18}$$

ここでF_1，F_2，F_3 はそれぞれ ρU^2，ρU，ρ の次元を持つ量で次のように表わされる。

$$\left.\begin{aligned} F_1 &= C_9 E_1 - B_J - C_P \\ F_2 &= C_9 E_2 (E_3 + E_4 + E_5 E_6) \\ F_3 &= C_9 E_7 (E_8 - E_9 + E_{10} + E_{11} E_6) \end{aligned}\right\} \tag{19}$$

$$\left.\begin{aligned} C_9 &= \lambda_I \rho / 2 \\ B_J &= \rho g \ell_2 \\ C_P &= \frac{\rho}{2} U_2^2 \left(1 - \frac{1}{C_4^4}\right) \\ E_1 &= \frac{U_2^2}{4} \frac{\ell_2}{d_{4D} - d_2} C_N \\ E_2 &= \frac{32}{\pi^2} U_2 \frac{A_2 A_3 \ell_2}{d_2^2 C_6} \end{aligned}\right\} \tag{20}$$

(19)，(20) 式中の$E_3 \sim E_{11}$，C_4，C_N，C_6 はいずれも②③間の流路形状のみにより求まる無次元の定数であり，詳しくは参考文献(7)を参照されたい。

(c) ①②間の吸込流

①②間の吸込流について同様に質量保存式と運動量保存式を作ると，直線的な流路面積変化を考慮して

$$\rho_0 A_0 U_0 = \rho_3 A_3 U_3 = \rho A_{SZ0} U_{SZ0} = W_S \tag{21}$$

$$A_{SZ0} (dP + dP_f + dP_H) + W_S dU_{SZ0} = 0 \tag{22}$$

$$\left.\begin{aligned} A_{SZ0} &= \pi\,(d_{SZ0}^2 - d_{DZ0}^2)\,/\,4 \\ d_{SZ0} &= d_0\left\{1-(1-\frac{d_3}{d_0})\,\frac{z}{\ell_1}\right\} \\ d_{DZ0} &= d_1\left\{1-(1-\frac{d_2}{d_1})\,\frac{z}{\ell_1}\right\} \end{aligned}\right\} \qquad (23)$$

が得られる。ここで(22)式第2項は二重円管内の管壁摩擦項であり，次式で与えられる。

$$dP_f = \lambda_S\,\frac{1}{d_{HZ}}\,\frac{\rho}{2}\,U_{SZ0}^2\,dz \qquad (24)$$

但し，水力直径d_{HZ}としては，流路面積が変化する二重円管の平均値をとり，更にその$1/2$の値を求め，この領域の出口近傍に近い位置の影響が支配的であるという効果を持たせた。λ_Sは領域内の管壁摩擦係数である。

$$d_{HZ} = (d_0 - d_1 + d_3 - d_2)\,/\,4 \qquad (25)$$

一方U_{SZ0}は(21)式と(23)式より次のように表わせる。

$$U_{SZ0} = \frac{U_0\,(1-C_3)}{(1-C_0 y)^2 - C_3\,(1-C_1 y)^2} \qquad (26)$$

$$\left.\begin{aligned} &y = z/\ell_1\,, \quad C_1 = 1-(d_2/d_1) \\ &C_0 = 1-(d_3/d_0)\,, \quad C_3 = (d_1/d_0)^2 \end{aligned}\right\} \qquad (27)$$

(22)式の第3項は式(4)と同形の①②間の位置差による圧力変化項であり，第4項は流速変化による項である。(26)(27)式より

$$dU_{SZ0} = \frac{U_0\,(1-C_3)\left\{2C_0\,(1-C_0 y) - 2C_1 C_3\,(1-C_1 y)\right\}}{\left\{(1-C_0 y)^2 - C_3\,(1-C_1 y)^2\right\}^2}\,dy \qquad (28)$$

となる。これらの関係を用いて(22)式を$z=0\sim\ell_1$間で積分すると次の関係式が得られる。

$$P_2 - P_0 + B_G\,U_0^2 - B_H = 0 \qquad (29)$$

$$\left.\begin{aligned} B_G &= B_5 B_6 + \rho B_7 \\ B_H &= \rho g\,\ell_1 \\ B_5 &= \lambda_S\,\frac{\ell_1}{d_{HZ}}\,\frac{\rho}{2}\,(1-C_3)^2 \end{aligned}\right\} \qquad (30)$$

ここでB_6，B_7はいずれもC_1，C_2，C_3の関数であり，従って流路形状のデータによって与えられる無次元の定数である。

(d) ②③間の吸込流

②③間の吸込流に対して，(b)の駆動流と同様に質量保存式と運動量保存式を作ると次のようになる。

$$\rho_3 A_3 U_3 = \rho_4 A_{4S} U_{4S} = \rho A_{SZ} U_{SZ} = W_S \tag{31}$$

$$A_{SZ}(dP + dP_{IS} + dP_f + dP_H) + W_S dU_{SZ} = 0 \tag{32}$$

(32) 式第2項 ($dF_{IS} \equiv A_{SZ} dP_{IS}$) は駆動流との間の流れ間摩擦の項であり，作用・反作用の法則により，(15) 式の第2項との間に次の関係が成り立つ。

$$dF_I + dF_{IS} = 0 \tag{33}$$

すなわち

$$dP_{IS} = -\frac{A_{DZ}}{A_{SZ}} dP_I \quad 。 \tag{34}$$

次に (32) 式第3項は吸込流と管壁との摩擦圧損の項であり，

$$dP_f = \lambda_w \frac{1}{d_{SZ}} \frac{\rho}{2} U_{SZ}^2 \, dz \tag{35}$$

と表わせる。ここに λ_w は管壁との摩擦係数である。第4項は位置差による圧力変化項である。これらの関係式に (16) 式を用いて (32) 式を $z = 0 \sim \ell_2$ まで積分し，$P_3 = P_2$ の仮定を用い次の式が得られる。

$$P_4 - P_2 + F_4 + F_5 U_3 + F_6 U_3^2 = 0 \tag{36}$$

ここに F_4，F_5，F_6 はそれぞれ ρU_3^2，ρU，ρ の次元を持つ係数である。

$$\left.\begin{aligned} F_4 &= C_9 E_{7B}(E_3 + E_4 + E_5 E_6) - B_J \\ F_5 &= C_9 E_2 (E_8 - E_9 + E_{10} + E_{11} E_6) \\ F_6 &= -C_9 E_{13}(E_{14} + E_{15} + E_{16} - E_{17} + E_{18} E_6) \\ &\quad + C_{16} E_{19} E_{20} (E_{23} - E_{24} + E_{25} + E_{26}) + E_{28} \end{aligned}\right\} \tag{37}$$

上式中の C_9，B_J，E_2 は (20) 式で与えられ，E_{7B}，C_{16}，E_{28} は次式に示すとおりである。

$$\left.\begin{aligned} E_{7B} &= \frac{E_{13A}}{C_6} \left(\frac{A_3}{A_3}\right)^2 U_2^2 \\ C_{16} &= \lambda_w \frac{\rho}{2} \\ E_{28} &= 8\rho \left(\frac{A_3}{\pi}\right)^2 (E_{27} - B_I) \end{aligned}\right\} \tag{38}$$

(37)，(38) 式に出てくるその他の係数はいずれも流路形状等の入力データにより決まる無次元の定数である。

(e) ③④間の流れ

③④間のスロート部は，流路形状の変化がなく，駆動流と吸込流が完全に混合を完了する領域であるとする。③においてそれぞれ U_{4D}，U_{4S} の流速を持っていた駆動流と吸込流は④では単一の流速 U_5 を持つ。③④間の任意の位置 z と z +dz 間の質量保存式と運動量保存式をつくると，z における駆動流と吸込流の流路面積を A_D，A_S 流速を U_D，U_S とすると

$$\rho_4 A_{4D} U_{4D} + \rho_4 A_{4S} U_{4S} = \rho_5 A_5 U_5 = \rho (A_D U_D + A_S U_S) \tag{39}$$

$$A_S (dP + dP_{fS} + dP_{IS} + dP_H) + W_S dU_S = 0 \tag{40}$$

$$A_D (dP + dP_{fD} + dP_{ID} + dP_H) + W_D dU_D = 0 . \tag{41}$$

ここで(40)，(41) 式の第3項は，この領域における流れ間の摩擦項であり，作用，反作用の法則により

$$A_S dP_{JS} + A_D dP_{ID} = 0 \tag{42}$$

となる。次に，(40)，(41) 式の第2項はそれぞれの流れと管壁との摩擦項であり，近似的にスロート出口流速の流体による摩擦圧損の式で次のように表わせるとする。

$$\left.\begin{aligned} &A_S dP_{fS} + A_D dP_{fD} = A_4 dP_f \\ &A_4 = A_S + A_D \\ &dP_f = \lambda \frac{1}{d_4} \frac{\rho}{2} U_5^2 dz \end{aligned}\right\} \tag{43}$$

ここに λ はスロート部の管壁摩擦係数である。(42)，(43) 式を用い，(40)，(41) の和をとると次のように表わせる。

$$A_4 (dP + dP_f + dP_H) + W_S dU_S + W_D dU_D = 0 \tag{44}$$

これを $z = 0 \sim \ell_3$ まで積分して

$$P_5 - P_4 + B_C U_5^2 + B_D + \frac{W_S}{A_4} (U_5 - U_{4S}) + \frac{W_D}{A_4} (U_5 - U_{4D}) = 0 \tag{45}$$

$$\left.\begin{aligned} &B_C = \lambda \frac{\ell_3}{2 d_4} \\ &B_D = - \rho g \ell_3 \end{aligned}\right\} \tag{46}$$

が得られる。

(f) ④⑤間の流れ

④⑤間は混合した単一の流体が流れるディフューザー領域であり，流路変化が直線的であるとする。質量保存式と運動量保存式は他の領域と同様に次式になる。

$$\rho_5 A_5 U_5 = \rho_6 A_6 U_6 = \rho_Z A_Z U_Z = W_S + W_D \tag{47}$$

$$A_Z (dP + dP_f + dP_H) + W_Z dU_Z = 0 \tag{48}$$

ここで流速の変化をその流路形状の変化

$$\left.\begin{aligned} &d_Z = d_5 (1 + C_2 y) \\ &A_Z = \pi d_Z^2 / 4 , \quad C_2 = (d_6 / d_5 - 1), \quad y = z / \ell_4 \end{aligned}\right\} \tag{49}$$

を用いて表わすと

$$\left.\begin{aligned} &U_Z = U_5 / (1 + C_2 y)^2 \\ &dU_Z = \frac{2 C_2 U_5}{(1 + C_2 y)^3} dy \quad . \end{aligned}\right\} \tag{50}$$

次に (48) 式第2項は壁摩擦係数 λ_{dif} を用いて

$$dP_f = \lambda_{dif} \frac{1}{d_Z} \frac{\rho}{2} U_Z^2 dz \tag{51}$$

と表わせ，第3項は位置差による圧力変化項である。これらの関係式より (48) 式を $z = 0 \sim \ell_4$ 間で積分し次の式が得られる。

$$P_6 - P_5 - B_E U_5^2 - B_F = 0 \tag{52}$$

$$\left.\begin{aligned} &B_E = \frac{\rho}{2} B_3 \left(1 - \lambda_{dif} \frac{\ell_4}{d_5} \frac{1}{4 C_2}\right) \\ &B_F = \rho g \ell_4 \end{aligned}\right\} \tag{53}$$

ここに B_3 , C_2 は流路形状のデータにより定まる無次元の定数である。

2.3 基礎式の解法とモデル使用上の留意点

前節において得られた6つの圧力平衡式をまとめると以下のようになる。

$$P_2 - P_1 + B_A U_1^2 - B_B = 0 \tag{9}$$

$$P_4 - P_2 + F_1 + F_2 U_3 + F_3 U_3^2 = 0 \tag{18}$$

$$P_2 - P_0 + B_G U_0^2 - B_H = 0 \tag{29}$$

$$P_4 - P_2 + F_4 + F_5 U_3 + F_6 U_3^2 = 0 \tag{36}$$

$$P_5 - P_4 + B_C U_5^2 + B_D + \frac{W_S}{A_4}(U_5 - U_{4S}) + \frac{W_D}{A_4}(U_5 - U_{4D}) = 0 \tag{45}$$

$$P_6 - P_5 - B_E U_5^2 - B_F = 0 \tag{52}$$

ここで，変数は圧力6点（P_0, P_1, P_2, P_4, P_5, P_6），各係数の中に入っているものも含めた流速8点（U_0, U_1, U_2, U_3, U_{4D}, U_{4S}, U_5, U_6），およびスロート入口での駆動流路径 d_{4D} である。P_0 と P_6 は境界条件として，隣接領域の圧力として与えられるので圧力の未知数は4になる。更に，各領域における質量保存式を用い，駆動流量（W_D）も隣接領域からの流量として与えられるので，吸込流量（W_S）のみを未知数の流量とすれば，上記8つの流速は W_S W_D と流体密度および入力として与える流路形状データにより与えられる。流体密度は質量およびエネルギー保存式より別途求まる。従って未知数は，P_1, P_2, P_4, P_5, W_S, d_{4D} の6つになり，上記6つの基礎式からこれらの物理量を求めることができる。

これらの理論解を得ることは困難であるので，計算機により数値解を求めるが，その際，d_{4D} を既知として解き，反復法によって d_{4D} を決定する方法をとった。ところで，本モデルは図2.1に示すように，ROSA－Ⅲのジェットポンプを対象に導いたものであるが，BWR で使用されているジェットポンプには同図の ℓ_2 部分が非常に小さく，駆動ノズルがスロート入口に直接吹き込まれる形状になっている。それで本モデルでは，BWR ジェットポンプも扱えるよう $\ell_2 = 0$ とする計算を行えるようにしている。ROSA－Ⅲにおいても，$\ell_2 = 0$ とおき，近似解を得ることができる。$\ell_2 = 0$ とすると，d_{4D} と P_4 が不用となり（$P_2 = P_3 = P_4$），②③間の駆動流と吸込流に対する基礎式が不用となる。従って未知数は P_1, P_2, P_5, W_S の4つ，基礎式は前掲の(9)，(29)，(45)，(52) の4式となり，数値計算は非常に簡単になる。

次に解の存在条件と，解がない場合の対応について示す。前述の6または4の基礎式の解の存在条件は，一次連立方程式の係数からなる行列式の判別式が正であることである。ここで，ある誤差範囲内において周囲の条件との間で整合性のある解が得られないなら，すなわち境界条件として与えられる P_0, P_6, W_D を与えて基礎式の解が得られない場合には，プログラム上判別式（HANB）が正でないという表示を行い，ジェットポンプモデルが使用されていないことを示すようにしてある。この場合には，計算を停止せずに前の計算ステップにおける駆動流量と吸込流量の値を採用し，RELAP 5コードによる他の解析条件がチェックできるようにしてある。但し，過渡状態の計算において，水単相の正流条件下である時刻に解がない状態が生じても，それ以後の時刻にジェットポンプ吸込部に二相流条件が生じた場合には，HANB$\leqq$0 の表示にも拘わらず，ジェットポンプモデルは使用されなくなり，以後ブランチコンポーネントとして機能し，過渡計算が続けられる。なお基礎式の解を得る上で，境界条件である P_0, P_6, W_D 等の他に，流路形状等の入力データのとり方も影響を及ぼすので，解析対象とするジェットポンプに対応したそれらの入力データを与える必要がある。特にジェットポンプのスロート入口径（d_4）は，その狭い流路を駆動流と吸込流が流れるので流速変化，従って圧力変化に大きく影響するので適切な値を選ぶことが必要である。これは次章に示すように，BWR／6の5

ホール駆動ノズルをもつジェットポンプにおいて，スロート入口の流れの構造がROSA－Ⅲのジェットポンプとかなり異なるが，このような場合のモデル化に当って特に注意を要する。

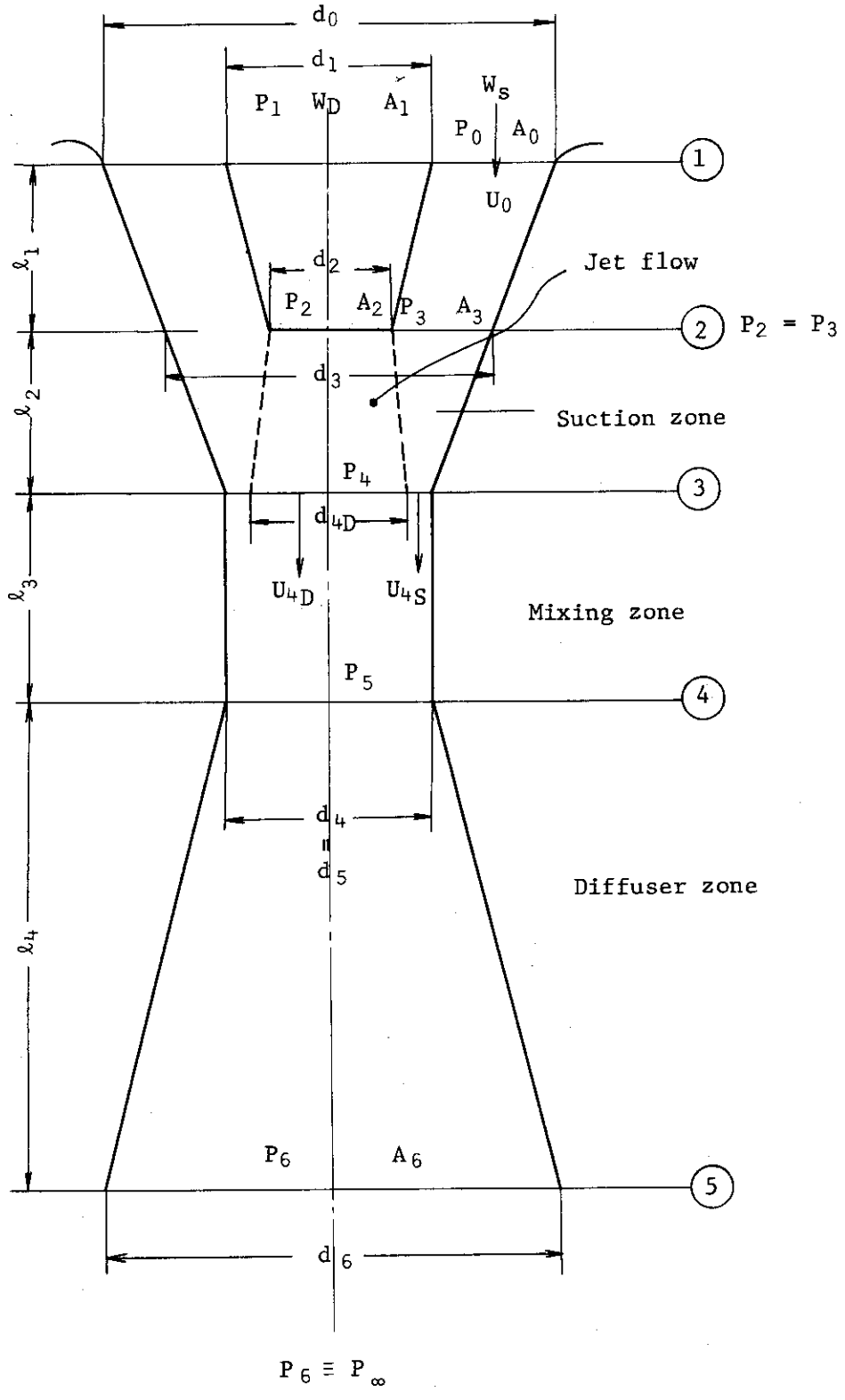


Fig. 2.1 JAERI Jet Pump Model

3. モデルの性能評価

ここでは，ROSA－Ⅲ実験におけるジェットポンプの定常及び過渡時の流れを対象とした解析により，改良した原研ジェットポンプモデルの性能評価を行う。実験データとこのモデルによる計算結果の比較に加えて，従来便宜的に使用してきた吸込側小ポンプモデルを用いた計算結果との比較を行う。更に実炉ジェットポンプモデルへの適用結果についても示す。

3.1 ROSA－Ⅲジェットポンプへのモデルの適用

(1) ROSA－Ⅲジェットポンプの特徴

ROSA－Ⅲ試験装置のジェットポンプを図3.1に，駆動ノズルと吸込部の詳細を図3.2に示す。ROSA－Ⅲ装置のジェットポンプは，システム全体のボリュームスケーリング及び炉心との相対高さを実機と合わせるために，圧力容器の外側に置かれ，2つの再循環ループにそれぞれ2基，合計4基装備されている。このため，その吸込部は実機と異なり，ダウンカマーとの間に吸込側配管を有し，かつ，吸込部は周囲を囲われたスロート状になっている。

図3.3にROSA－Ⅲの定常流ジェットポンプ特性試験結果[6]の1例を示す。横軸のM値は，吸込流量と駆動流量の比を示す。縦軸のN値は，吸込流の全水頭増分と駆動流の全水頭損失の比である。図中にはBWR／6の特性が比較してあり，高流量時のROSA－Ⅲジェットポンプは実機の特性に近いことがわかる。

(2) ジェットポンプモデルの適用

ROSA－Ⅲのジェットポンプと周辺の配管を図3.4のようにモデル化する。ジェットポンプ・コンポーネント（C180，C240）は駆動ノズルより下方，全長402 mmの範囲とし，その下方をパイプ・コンポーネント（吐出側配管，C185とC245）とした。実際の吸込流と駆動流の混合領域はスロート部（内径19.3 mm，長さ100 mm）と考えられるが，他のコンポーネントより著しく小さいボリュームになるとRELAP 5コードによる解の不安定性と計算時間の増大を招くので，ここでは混合部を上記範囲とし，それを平均断面を持つ単管として扱う。

原研ジェットポンプモデルに必要な入力データを表3.1に示す（詳細は付録2－Cのコンポーネント180，240を参照されたい）。ここでは安定解を得やすくするために，駆動ノズルがスロート部に接している場合（$\ell_2 \equiv 0.0$）を考え，第2章に示した近似解の場合を適用した。なお，ジェットポンプモデルを適用するC180，C240の近傍の各部流路径，領域長さおよび摩擦係数は1基当りの値であるが，これらのコンポーネントのジャンクションにおける流量と流路面積は2基分の値となっている。

(3) RUN 926，RUN 912実験

原研ジェットポンプモデルの性能評価のため，以下ではROSA－Ⅲ大破断実験RUN 926[8]および小破断実験RUN 912[9]を対象として解析を行った。3.2節に定常流ジェットポンプ特性の性能評価を，3.3節および3.4節に過渡時流量特性の性能評価を示す。また，付録1には，

長時間LOCA解析における本ジェットポンプモデルの性能評価を示す。本項では，これらの性能評価において解析対象となったROSA－Ⅲ RUN 926およびRUN 912実験について簡単に述べる。

RUN 926は，HPCS故障を仮定した再循環ポンプ入口配管の200％両端破断模擬実験である。主な初期条件は，蒸気ドーム圧力：7.37 MPa，下部プレナム温度：553 K（サブクーリング：10 K），炉心入口流量：16.3 kg／s，炉心出力：3.97 MW，炉心出口クォリティ：13.9％である。ジェットポンプ1基の駆動流量と吸込流量は平均してそれぞれ1.56 kg／s，2.51 kg／s である。破断後，系圧力は，破断口よりの流体の流出により減少する（図A 1.1参照）。健全ループジェットポンプの流れは，破断と同時に再循環ポンプがコーストダウンを開始するので駆動流と吸込流も流量低下する。一方，破断ループジェットポンプでは，破断直後に駆動流が逆流する。破断後5.4秒における主蒸気隔離弁（MSIV）の閉鎖により系圧力は上昇を開始する。しかし，ダウンカマ内混合水位が破断後急速に減少し，破断後13秒に，再循環ループへの出口ノズルまで低下すると，圧力容器側の破断口より直接蒸気が放出されるようになり，系圧力は再び急減少を開始する。破断後17秒に系圧が6.4 MPa 以下まで低下すると，下部プレナム流体は飽和状態に達しフラッシングを開始する。下部プレナムフラッシングの開始後，下部プレナムでの連続的な蒸気発生により系の減圧速度が低下する。系圧力が2.2 MPaになると給水ラインの流体がフラッシングを開始し，再び系の減圧速度が低下する。LPCSおよびLPCIは系圧力がそれぞれ2.2 MPaおよび1.6 MPaになった時作動する。炉心内混合水位はLPCI作動後急速に回復し，リフラッド後まもなく全炉心がクエンチする。

RUN 912は，HPCS故障を仮定した再循環ポンプ入口配管の5％スプリット破断模擬実験である。主な初期条件は，蒸気ドーム圧力：7.35 MPa，下部プレナム温度：552 K（サブクーリング：11 K），炉心入口流量：16.0 kg／s，炉心出力：3.97 MW，炉心出口クォリティ：13.5％である。破断後，系圧力は，蒸気ラインおよび破断口よりの冷却材の流出，および炉心出力の低下により減少する（図A 1.5参照）。ジェットポンプの駆動流と吸込流は，健全ループと破断ループいずれにおいても破断後再循環ポンプトリップにより流量低下する。破断後24秒における主蒸気隔離弁（MSIV）の閉鎖により系圧力は上昇を開始し，安全弁の設定圧力に達する。系圧力は，84秒より109秒まで安全弁により8.3 MPa と8.4 MPa 間に維持される。158秒に自動減圧系（ADS）が作動すると，系圧力は急激な減少を開始する。系圧力が6.4 MPa に達すると下部プレナム流体がフラッシングを開始し，系の減圧速度が低下する。系圧力が2.1 MPaになると給水ラインの流体がフラッシングを開始し，再び系の減圧速度が低下する。LPCSおよびLPCIが，系圧力がそれぞれ2.2 MPa および1.6 MPa になった時作動する。

3.2 定常流ジェットポンプ特性の比較

原研ジェットポンプモデルを組み込んだRELAP 5／MOD 1（CY1）コードによるジェットポンプの定常流下のM－N特性を検討するため，ROSA－Ⅲ大破断実験RUN 926 [8] の初期状態を対象に計算を行った。（定常計算，JAERI－model）。システム全体を図3.5(a)に示すコンポ

ーネント構成で模擬した。この入力データを付録2－Cに示す。同様の入力データを用い，ジェットポンプ吸込部を小ポンプに置きかえた従来の解析結果（図3.5(b)）も合せて比較する（定常計算，Small pump model，図3.5(a)および(b)における略号および図示記号については，表3.4を参照されたい。）この小ポンプモデルは，ROSA－Ⅲの再循環ポンプの特性（ホモロガス曲線）を使用し，破断前の定常状態におけるジェットポンプ吸込流量を与えるものである。しかし吸込部がポンプであるため，吸込側圧力よりも混合部圧力が高くなること，また逆流時においてもポンプ慣性により吸込流を駆動する場合も生じること等，実際と異なる特性が生じるという点で，本来，便宜的な手法である。

表3.2に，ジェットポンプモデルを使用した場合の定常計算結果を示す。健全および破断ループのジェットポンプまわりの流量によい定常性が得られている。3.3節と3.4節に示す解析では，この定常性の得られた解析条件を使用する。

次に，ジェットポンプの定常流におけるM－N特性について，実験データとジェットポンプモデルおよび小ポンプモデルによる解析結果とを表3.3に示す。ここのM値とN値は，安定した流れの得られた状態（計算後9.6秒後）の値である。なお，計算上の駆動流量と吸込流量は，JP1とJP2，およびJP3とJP4をそれぞれ1つのジェットポンプ・コンポーネントとして扱っているので，実際に各ジェットポンプを流れる流量の2倍の値となっている。一方，小ポンプモデルによる定常計算では，ジェットポンプの駆動流に加えて吸込流も小ポンプで駆動しており，定常計算ではこのポンプが回転数と流量を維持しているので，流量は初期値と全く同じである。

この表中のM値とN値は次のようにして求めた。

$$M = W_S / W_{DR}$$

但し，

W_S：吸込流量　　(kg／s)

W_{DR}：駆動流量　　(〃)

$$N = \frac{\text{吸込流の全水頭増加分}}{\text{駆動流の全水頭損失分}}$$

$$= \frac{H_{DI} - H_S}{H_{DR} - H_{DI}}$$

ここでHは全水頭であり，DI，S，DRはそれぞれ吐出部，吸込部，駆動部の添字である。計算結果と実験データにおいては静圧を求めている位置が異なるのでこの補正を行う必要がある。ここでは実験データを基準として考えることにし，計算結果の静圧に位置および形状の相違に基づくヘッド及び圧損分を補正する。健全ループの駆動側配管においては，実験上の圧力測定点は上端にあり，一方計算では，C 16006コンポーネント中心の圧力を求めており，両者の位置の相違に基づくヘッドの補正（－2KPa）をする必要がある。駆動部の圧力測定点とC 16006の中心点における流路間の圧損は非常に小さいのでこれは無視する。次に吐出側配管では圧力測定点とコンポーネント（C 18501）中心との位置の差は0.53mであり，これのヘッド補正分は－4KPaである。吐出側配管でも圧力測定点とコンポーネント中心間の圧損は非常に小さいので無視する。一方吸込側配管ではこのヘッド補正は不要であるが，コンポーネント（C 17002）中心と

圧力測定点の間に流路形状の複雑な変化がありこの圧損は無視できない。コンポーネント中心から配管末端までの管内圧損，配管出口での急拡大と円柱への衝突流れおよび流れの曲がりを考慮すると，圧損分は約8KPaになる。従って吸込側静圧の計算値には－8KPaの補正を要する。

このようにして求めた各部静圧と各部の動圧損とから，実験結果，原研ジェットポンプモデルによる計算結果，および小ポンプモデルによる計算結果3者のN値を求めると表3.3のようになる。ここには流量比M値も併せて示してある。表から，原研ジェットポンプモデルによる定常流MN特性は実験結果をかなりよく模擬できているといえる。これに対し，小ポンプモデルでは定常流の流量はよく合っているが，圧力特性は全く異なっている。つまり，吸込部をポンプとして扱っているためにジェットポンプ吐出部よりジェットポンプ吸込部の静圧が高くなり，N値は負の値を示すことになる。

以上のように，改良されたジェットポンプモデルを組み込んだRELAP 5／MOD 1(CY1)コードにより，ROSA－Ⅲのジェットポンプにおける定常流MN特性を安定的に模擬する計算結果が得られた。従来の小ポンプモデルでは，流量は合わせることはできても，圧力分布は模擬できない。

3.3　大破断実験における過渡流量特性

本節では，ROSA－Ⅲ大破断実験RUN 926 [8] を原研ジェットポンプモデルを組み込んだRELAP 5／MOD 1コードで解析することにより，本モデルの大破断初期の過渡状態における性能評価を行う。RUN 926は，高圧炉心スプレー系（HPCS）の故障を仮定した再循環ポンプ入口側配管の200％両端破断模擬実験である。大破断実験の場合，破断初期に炉心入口流量の低下により一時的な燃料棒表面のドライアウト－リウェットが発生するため，その正確な予測にはジェットポンプ回りの流れの計算が重要となる。その計算を通してジェットポンプモデルの炉心流量及び炉心冷却条件に対する性能評価を行うことができる。小ポンプモデル（Small Pump Model）を用いた解析および原研ジェットポンプモデル（JAERI Jet Pump Model）を用いた解析に使用したノーディング図は，前節と同じである。（図3.5(a)および(b)のノーディング図における略号および図示記号については表3.4を参照されたい。）また，原研ジェットポンプモデルおよび小ポンプモデルを用いた解析に使用したインプットデータを，それぞれ付録2－C－1および2－C－2に示す。（ただし，付録2－C－2には，小ポンプモデルに対応する付録2－C－1よりの変更点のみを示す。）ノーディングおよびインプットデータとも，ジェットポンプ部（1 Volume）を除き両モデルで同じである。また，ジェットポンプ部および吸込部についても，各モデル内の制約によるもの以外はできる限り同じインプットデータを使用した。

両モデルで計算した破断初期（0～40s）のジェットポンプ回りの流量を実験結果とともに，図3.6(a)～(f)に示す。図3.6(a)～(c)が健全側ジェットポンプ，図3.6(d)～(f)が破断側ジェットポンプにおける結果である。実験データについては，流量計測定レンジ下限以下となり測定不可能となった場合には図中に示されていない。原研ジェットポンプモデルによる計算の場合，健全側ジェットポンプでは約5sで気泡が発生し（二相流となり）以後ジェットポンプモデルは使用されなかった。また，破断側ジェットポンプでは破断後すぐにジェットポンプ内流れが逆流し，ジ

ェットポンプモデルが使用されたのは定常状態のみである。健全側ジェットポンプでは，破断直後の駆動流は，再循環ポンプ吐出流量によってほぼ決るため両モデルともほぼ同じ値となり実験データとも一致している。破断直後の吸込流は，原研ジェットポンプモデルの場合，実験データとよく一致し，本モデルによりジェットポンプ回りの流れがよく模擬されていることがわかる。しかし，小ポンプモデルでは破断直後の吸込流は実験データよりかなり大きな値となっている。吐出流は駆動流と吸込流の和であるため，破断直後の吐出流についても，破断直後の吸込流と同じことが言える。一方，破断側ジェットポンプでは，原研ジェットポンプモデルによる計算の場合，定常時のみ本モデルは使用され破断後すぐに逆流のためRELAP 5／MOD 1 コード内のブランチコンポーネントモデルが使用されたが，計算結果は実験結果とかなりよく一致している。しかし，小ポンプモデルの場合，破断直後の吸込流は非常に大きくなり実験データの傾向から大きくはずれる。吐出流量も正流であり実験データよりかなり大きな値となっている。なお，小ポンプモデルの場合，吸込流量は種々のポンプパラメータ（特に慣性モーメント等）を適当に選ぶことにより改善されうるが，その場合でも，ジェットポンプ周りの圧力分布の変化，流れ方向の変化等の物理現象を表わすことは困難である。

表3.5および3.6に，原研ジェットポンプモデルが使用された0～4ｓにおけるＭ値およびＮ値をそれぞれ示す。これらのＭ値およびＮ値は，定常流の場合（3.2節参照）と同じ定義に基づき求めたものであり，特にＮ値は位置および形状の相違に基づくヘッドおよび圧損分を補正した後の値である。表3.5および3.6では，実験データで測定レンジ下限以下のもの，および計算値で絶対値が小さく誤差が大きくなるものは省いてある。また，破断側ジェットポンプでは，破断直後にジェットポンプ内流れが逆流するため正流特性を表わすＭ値，Ｎ値は示されていない。表3.5より，大破断の破断初期過渡状態においても，原研ジェットポンプモデルによりＭ値がかなりよく模擬されていることがわかる。Ｎ値については，前節で述べたように，定常状態では，小ポンプモデルでは本質的に模擬できないものであるが，表3.6に示されているように，原研ジェットポンプモデルではよく模擬されていることがわかる。また，大破断の破断初期過渡状態におけるＮ値も，原研ジェットポンプモデルにより比較的よく模擬されていることがわかる。

図3.7(a)および(b)に，炉心入口流量（高出力チャンネルと平均出力チャンネルに流入する流量の和）の実験値と，それぞれ小ポンプモデルおよび原研ジェットポンプモデルによる計算値の比較を示す。原研ジェットポンプモデルでは，前述のようにジェットポンプ吐出流量がよく模擬されているため，炉心入口流量の計算値も実験データとよく一致している。一方，小ポンプモデルでは，ジェットポンプ吸込部に設けた小ポンプの影響により，計算値は実験値よりもかなり大きくなっている。実験で約16ｓ以後，計算で約14ｓ以後の炉心入口流量の急激な増加は，下部プレナムフラッシングに伴う流量増大である。

以上のように，原研ジェットポンプモデルを組込んだRELAP 5／MOD 1 (CY 1)コードにより，大破断ＬＯＣＡ時の破断初期のジェットポンプ回りの流れおよび炉心の流れをよく模擬できることが明らかとなった。

なお，原研ジェットポンプモデルを組込んだRELAP 5／MOD 1 (CY 1)コードによりRUN926の長時間ＬＯＣＡ解析を行った結果を付録1(1)に示す。

3.4 小破断実験における過渡流量特性

本節では，ROSA－Ⅲ小破断実験RUN 912 [9] を原研ジェットポンプモデルを組込んだRELAP5／MOD1（CY1）コードで解析することにより，本モデルの小破断初期の過渡状態における性能評価を行う。RUN 912はHPCSの故障を仮定した再循環ポンプ入口側配管の5％スプリット破断模擬実験である。小破断実験の場合，破断後長期間ジェットポンプ回り流れは水単相の正流となるため，その点でジェットポンプモデルの性能評価に適していると言える。小ポンプモデルを用いた解析および原研ジェットポンプモデルを用いた解析に使用したノーディング図を，それぞれ図3.8(a)および3.8(b)に示す（表3.4参照）。また，原研ジェットポンプモデルおよび小ポンプモデルを用いた解析に使用したインプットデータを，それぞれ付録2－C－3および2－C－4に示す。（ただし，付録2－C－4には，小ポンプモデルに対応する付録2－C－3よりの変更点のみを示す。）小破断解析用に自動減圧系（ADS）および安全弁（SRV)用のノーディングを増加した点を除き，図3.8(a)および(b)のノーディングは大破断用のノーディング，図3.5(a)および(b)とそれぞれ同じである。初期値のインプットデータについても，RUN 912実験に対応した変更点を除き，流量，エンタルピ分布等は大破断解析の場合と同じインプットデータを用いた。これは，両実験における実験条件がほぼ同じであり，若干の初期流量等の相違は今回の解析には特に問題とならないものだからである。

両モデルで計算した破断初期（0－40s）のジェットポンプ回りの流量を実験結果とともに，図3.9(a)～(f)に示す。図3.9(a)～(c)が健全側ジェットポンプ，図3.9(d)～(f)が破断側ジェットポンプにおける結果である。実験データについては，流量計測定レンジ下限以下となり測定不可能となった場合には図中に示されていない。原研ジェットポンプモデルによる計算の場合，健全側ジェットポンプ，破断側ジェットポンプともに，破断後約15秒で，2.3節で述べた判別式に関する条件を満足しなくなった（HANB $\leqq$ 0）が，その直後に吸込部が二相流条件になったため，以後RELAP5／MOD1コード内のブランチコンポーネントモデルが使用された。小破断（5％破断）の場合，破断口よりの流量流量が小さく，ジェットポンプ回りの流れは健全側と破断側とでほぼ同じ値となっている。従って，ここでは健全側ジェットポンプ回りの流れについてのみ述べる。破断直後の駆動流は，再循環ポンプ吐出流量によってほぼ決るため両モデルともほぼ同じ値で，実験データともほぼ等しい。破断直後の吸込流は，原研ジェットポンプモデルの場合実験データとよく一致し，本モデルによりジェットポンプ回りの流れがよく模擬されていることがわかる。小ポンプモデルでは破断直後の吸込流は実験データよりかなり大きな値となっている。吐出流は駆動流と吸込流の和であるため，破断直後の吐出流についても，破断直後の吸込流と同じことが言える。

表3.7および3.8に，原研ジェットポンプモデルが使用された0～12sの時間帯におけるM値およびN値をそれぞれ示す。表3.8中のN値は，3.2節で述べた位置および形状の相違に基づくヘッドおよび圧損分を補正した後の値である。表3.7および3.8では，実験データで測定レンジ下限以下のもの，および計算値で絶対値が小さく誤差の大きくなるものは省いてある。なお，健全側ジェットポンプの駆動流の測定値は誤差が大きかったため，便宜的にほぼ等しいと考えられる破断側ジェットポンプの駆動流の測定値を使用した。表3.7より，小破断の破断初期過渡状態

においても，原研ジェットポンプモデルによりM値がかなりよく模擬されていることがわかる。N値については，3.2節で述べたように，定常状態では，小ポンプモデルでは本質的に模擬できないものであるが，表3.8に示されているように，原研ジェットポンプモデルではよく模擬されていることがわかる。また，小破断の破断初期過渡状態におけるN値も，原研ジェットポンプモデルにより比較的よく模擬されていることがわかる。

図3.10(a)および(b)に，炉心入口流量の実験値と，それぞれ小ポンプモデルおよび原研ジェットポンプモデルによる計算値の比較を示す。原研ジェットポンプモデルでは，前述のようにジェットポンプ吐出流量がよく模擬されているため，炉心入口流量の計算値も実験値と近い値となっている。しかし小ポンプモデルでは，大破断解析と同様にジェットポンプ吸込部に設けた小ポンプの影響により，計算値は実験値よりもかなり大きくなっている。

以上のように，原研ジェットポンプモデルを組込んだRELAP 5／MOD 1コードにより，小破断LOCA時の破断初期のジェットポンプ回りの流れをよく模擬できることが明らかとなった。

なお，原研ジェットポンプモデルを組込んだRELAP 5／MOD 1コードによりRUN 912の長時間LOCA解析を行った結果を付録1(2)に示す。

3.5 BWRジェットポンプへの適用

これまでのところ，我々はROSA－Ⅲ試験装置におけるジェットポンプを対象として，原研ジェットポンプモデルの有用性を示してきた。一方BWRに使用されているジェットポンプは，ROSA－Ⅲジェットポンプに比べて吸込部の形状と駆動ノズルの形状が大きく異なるので，これを対象に解析する際，若干の工夫を必要とする。以下にBWRジェットポンプの特徴とモデル化，および定常流ジェットポンプ特性について示す。

(1) BWRジェットポンプの特徴

図3.11と3.12にBWRジェットポンプの全体図，スロート近傍の概要を示す。BWR／6（251－848）には，1つの再循環ループ当りライザー6基，ジェットポンプ12基が配置されている。一般のジェットポンプに比べて特徴的なのは，駆動ノズルの先端が5つ（5 holes）に分かれてスロートの周辺近くに配置され，ジェットポンプ効率を高める工夫がされていることである。従って吸込流は，この5つの駆動ノズルの周辺からスロートに吸込まれることになる。なお，このジェットポンプはダウンカマー内に置かれ，その吸込位置は炉心高さの約2／3の位置にある。この高さは冷却材喪失事故時の再冠水過程における炉心冷却の確保に重要な役割を持つものである。

(2) ジェットポンプモデルの適用

図3.13にBWR／6（251－848）のコンポーネント構成を示す。これは，計算時間短縮のために，ROSA－Ⅲ実験解析に用いたコンポーネント構成（図3.5(b)）より簡略化されている。健全ループのジェットポンプ駆動部はC 16002（C 213），混合部はC 180（C 240），吐出部はC 185（C 245）で示されている。文中（ ）内は破断ループジェットポンプのコンポーネントである。BWRのジェットポンプ吸込部は，形状と範囲を特定しにくいが，ここでは，容積的には計算の安定性という観点からスロート部と同じ値を用いることにし，その他のコンポーネン

ト入力データについてはできるだけ実際の形状に近い値を用いることにした。

図2.1に示した原研ジェットポンプモデルを適用し，駆動ノズル先端はスロート上端と同じ高さにある（$\ell_2 = 0.0$）とした。なお，本ジェットポンプモデルでは12基のジェットポンプを1つのコンポーネントで代表させるので，形状データは1基当りのデータを用い，通過流量は全流量の $\ell/12$ の値を用い圧力分布を模擬している。

ところで，実機のジェットポンプ駆動ノズルは5つのノズルから成ることは既に示したが，この場合，駆動ノズルが等価な面積をもつ1つのノズルの場合に比べて，吸込流と駆動流の接触面積が数倍増加する（ノズル外周の長さは$\sqrt{5} = 2.24$倍になる）。そして5つのノズルがスロート外周付近に配置されているので，このノズル近傍の吸込流の流速は，スロート断面の中心付近の吸込流速より高いものと考えられる。従って，吸込流量の大半は流速の大きい外周部分を中心に流れることになり，このことは吸込流の流路面積が実効的に小さい場合に相当する。実際，d_4 について感度解析を試みたところスロート径を与えた場合には安定した流れが得られず，スロート径の80％の値を与えた場合に次節に示す比較的安定した流れの解が得られた。このように，実機のジェットポンプ本モデルを適用する際には縮少されたスロート径d_4を使用する必要があることがわかった。表3.9にRELAP5コード用のBWRジェットポンプモデルの入力データ（コンポーネント180，240）を示す。

(3) BWRの定常流ジェットポンプ特性

RELAP5／MOD1／CY18に組み込んだ原研ジェットポンプモデルを用い，BWR／6(251－848）の定常状態を計算した。ROSA－Ⅲを対象とした計算（前節3.2）と同様に，計算結果の安定性とジェットポンプのMN特性について以下に示す。

表3.10に5秒間の定常計算におけるジェットポンプ駆動流，吸込流，吐出流の変化を示す。駆動流は再循環ポンプが作動しているのでほぼ一定の値を示す。吸込流は徐々に減少し，5秒後にほぼ一定の値となった（健全ループ側で初期値の63％，破断ループ側で65％）。吐出流量は駆動流と吸込流の和であるので，吸込流の減少分だけ流量が低下し，初期値の74％，77％になり一定値を示した。このように定格状態から若干ずれた状態ではあるが，本モデルにより安定した流れの解を得ることができた。

次に，初期状態（BWR／6の定格運転状態）と5秒後の状態におけるジェットポンプのMN特性の計算結果を述べる。表3.10に示すように5秒後で一定値になった状態では，M値は1.52～1.53になり実機条件の62～63％になっている。一方N値は実機条件の40％前後になっている。このように実機のジェットポンプMN特性の正確な予測には，今後モデルの改良も含めた検討が必要であるが，現段階で本モデルを使用して安定した流れの解を得る入力データを選定することができた。

Table 3.1 Input data for ROSA-III jet pump analysis

(a) Geometry (Diameter in m)

Item	d_0	d_1	d_2	d_3	d_4	d_5	d_6
Value	0.05349	0.01566	0.0084	0.0193	0.021	0.0193	0.0495

(b) Geometry (Length in m)

Item	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4
Value	0.033	0.025	0.0	0.117	0.285

(c) Friction Factor

Item	LAMDN	LAMMZ	LAMI	LAMDIF	LAMS1	LAMS2
Value	0.024	0.024	0.0	0.024	1.8*	0.024

* Include effects of pressure loss between suction line piping and suction throat in the ROSA-III jet pump

Table 3.2 Stability for ROSA-III jet pump flow analysis

TIME (SEC)	P 80010000 (PA)	Intact Loop JP			Broken Loop JP		
		MFLOWJ 180010000 (KG/SEC) W_D	MFLOWJ 180020000 (KG/SEC) W_S	MFLOWJ 180030000 (KG/SEC) W_{DI}	MFLOWJ 240010000 (KG/SEC) W_D	MFLOWJ 240020000 (KG/SEC) W_S	MFLOWJ 240030000 (KG/SEC) W_{DI}
0.0	7.2973D+06	3.1700	4.9400	8.1100	3.1700	4.9400	8.1100
0.10000	7.2958D+06	3.2248	4.9208	8.2154	3.2016	4.8808	8.1519
0.20000	7.2962D+06	3.2274	5.0113	8.3078	3.2134	4.9394	8.2226
0.30000	7.2965D+06	3.2255	5.0110	8.3056	3.2110	4.9391	8.2199
0.40000	7.2971D+06	3.2268	5.0106	8.3066	3.2121	4.9388	8.2208
0.50000	7.2977D+06	3.2289	5.0103	8.3083	3.2142	4.9384	8.2225
0.60000	7.2975D+06	3.2254	4.9817	8.2767	3.2047	4.9363	8.2104
0.70000	7.2978D+06	3.2284	4.9814	8.2794	3.2075	4.9359	8.2128
0.80000	7.2979D+06	3.2304	4.9811	8.2810	3.2095	4.9356	8.2145
0.90000	7.2975D+06	3.2282	4.9808	8.2786	3.2078	4.9353	8.2126
1.0000	7.2969D+06	3.2233	4.9805	8.2734	3.2038	4.9303	8.2035
1.1000	7.2962D+06	3.2212	4.9452	8.2360	3.2043	4.8874	8.1616
1.2000	7.2961D+06	3.2185	4.9158	8.2040	3.2026	4.8571	8.1296
1.3000	7.2969D+06	3.2183	4.9134	8.2014	3.2027	4.8553	8.1279
1.4000	7.2983D+06	3.2201	4.8935	8.1833	3.2044	4.8357	8.1100
1.5000	7.3003D+06	3.2199	4.9388	8.2124	3.2087	4.8763	8.1398
1.6000	7.3010D+06	3.2265	5.0036	8.2848	3.2069	4.9657	8.2264
1.7000	7.3006D+06	3.2279	5.0392	8.3206	3.2120	4.9783	8.2439
1.8000	7.2987D+06	3.2253	5.0388	8.3175	3.2101	4.9778	8.2415
1.9000	7.2954D+06	3.2175	5.0339	8.3049	3.2046	4.9736	8.2321
2.0000	7.2922D+06	3.2144	4.9535	8.2216	3.2023	4.9047	8.1610
2.1000	7.2902D+06	3.2096	4.9009	8.1642	3.1992	4.8430	8.0963
2.2000	7.2899D+06	3.2077	4.8830	8.1443	3.1954	4.8390	8.0882
2.3000	7.2916D+06	3.2107	4.8631	8.1273	3.1992	4.8193	8.0722
2.4000	7.2940D+06	3.2175	4.9343	8.2056	3.2046	4.8851	8.1435
2.5000	7.2948D+06	3.2224	5.0312	8.3074	3.2100	4.9699	8.2336
2.6000	7.2944D+06	3.2285	5.0524	8.3343	3.2127	4.9959	8.2622
2.7000	7.2926D+06	3.2253	5.0519	8.3307	3.2103	4.9954	8.2593
2.8000	7.2895D+06	3.2214	5.0315	8.3071	3.2047	4.9899	8.2482
2.9000	7.2863D+06	3.2142	4.9587	8.2265	3.2023	4.9052	8.1611
3.0000	7.2845D+06	3.2099	4.8976	8.1610	3.2001	4.8378	8.0922
3.1000	7.2844D+06	3.2068	4.8791	8.1394	3.1954	4.8362	8.0852
3.2000	7.2865D+06	3.2116	4.8467	8.1129	3.2005	4.7972	8.0525
3.3000	7.2890D+06	3.2171	4.9447	8.2155	3.2046	4.8936	8.1520
3.4000	7.2900D+06	3.2251	5.0334	8.3120	3.2081	4.9946	8.2565
3.5000	7.2898D+06	3.2284	5.0515	8.3333	3.2129	4.9997	8.2661
3.6000	7.2880D+06	3.2244	5.0510	8.3288	3.2098	4.9992	8.2625
3.7000	7.2851D+06	3.2208	5.0280	8.3033	3.2058	4.9785	8.2378
3.8000	7.2822D+06	3.2140	4.9506	8.2180	3.2005	4.9021	8.1561
3.9000	7.2808D+06	3.2089	4.8879	8.1502	3.1977	4.8377	8.0890
4.0000	7.2813D+06	3.2065	4.8797	8.1398	3.1958	4.8282	8.0777
4.1000	7.2839D+06	3.2112	4.8537	8.1192	3.1975	4.8056	8.0569
4.2000	7.2862D+06	3.2180	4.9614	8.2331	3.2039	4.9134	8.1712
4.3000	7.2872D+06	3.2254	5.0442	8.3231	3.2102	4.9990	8.2629
4.4000	7.2869D+06	3.2274	5.0577	8.3385	3.2125	5.0020	8.2681
4.5000	7.2850D+06	3.2224	5.0571	8.3329	3.2085	5.0015	8.2635
4.6000	7.2822D+06	3.2201	5.0080	8.2826	3.2040	4.9652	8.2227
4.7000	7.2797D+06	3.2119	4.9353	8.2006	3.2018	4.8814	8.1373
4.8000	7.2788D+06	3.2070	4.8902	8.1506	3.1983	4.8275	8.0800
4.9000	7.2800D+06	3.2057	4.8780	8.1372	3.1950	4.8268	8.0754

Table 3.2 (Cont'd)

TIME (SEC)	P 80010000 (PA)	Intact Loop JP			Broken Loop JP		
		MFLOWJ 180010000 (KG/SEC) W_D	MFLOWJ 180020000 (KG/SEC) W_S	MFLOWJ 180030000 (KG/SEC) W_{DI}	MFLOWJ 240010000 (KG/SEC) W_D	MFLOWJ 240020000 (KG/SEC) W_S	MFLOWJ 240030000 (KG/SEC) W_{DI}
5.0000	7.2829D+06	3.2126	4.8649	8.1317	3.2002	4.8191	8.0736
5.1000	7.2851D+06	3.2217	4.9707	8.2472	3.2051	4.9311	8.1901
5.2000	7.2858D+06	3.2248	5.0554	8.3338	3.2105	4.9968	8.2609
5.3000	7.2854D+06	3.2266	5.0547	8.3348	3.2121	4.9968	8.2625
5.4000	7.2834D+06	3.2205	5.0541	8.3282	3.2073	4.9962	8.2571
5.5000	7.2807D+06	3.2189	4.9912	8.2643	3.2025	4.9500	8.2059
5.6000	7.2787D+06	3.2115	4.9160	8.1815	3.2026	4.8629	8.1200
5.7000	7.2782D+06	3.2063	4.8807	8.1406	3.1961	4.8232	8.0728
5.8000	7.2797D+06	3.2087	4.8402	8.1034	3.1965	4.7941	8.0453
5.9000	7.2831D+06	3.2123	4.8898	8.1559	3.2012	4.8388	8.0939
6.0000	7.2851D+06	3.2197	4.9975	8.2709	3.2067	4.9456	8.2061
6.1000	7.2857D+06	3.2282	5.0470	8.3298	3.2141	4.9880	8.2569
6.2000	7.2851D+06	3.2284	5.0464	8.3294	3.2143	4.9874	8.2564
6.3000	7.2831D+06	3.2215	5.0457	8.3219	3.2088	4.9867	8.2503
6.4000	7.2805D+06	3.2166	4.9767	8.2479	3.2063	4.9220	8.1829
6.5000	7.2789D+06	3.2113	4.9007	8.1666	3.2002	4.8540	8.1089
6.6000	7.2789D+06	3.2080	4.8646	8.1274	3.1978	4.8157	8.0683
6.7000	7.2809D+06	3.2050	4.8435	8.1021	3.1958	4.7898	8.0394
6.8000	7.2843D+06	3.2154	4.9040	8.1744	3.2042	4.8532	8.1124
6.9000	7.2862D+06	3.2200	5.0177	8.2915	3.2058	4.9709	8.2308
7.0000	7.2867D+06	3.2279	5.0559	8.3385	3.2132	5.0033	8.2713
7.1000	7.2859D+06	3.2261	5.0552	8.3360	3.2124	5.0034	8.2705
7.2000	7.2838D+06	3.2164	5.0494	8.3193	3.2077	4.9896	8.2517
7.3000	7.2815D+06	3.2122	4.9667	8.2324	3.2018	4.9142	8.1694
7.4000	7.2803D+06	3.2065	4.8975	8.1575	3.1967	4.8522	8.1025
7.5000	7.2808D+06	3.2036	4.8723	8.1295	3.1947	4.8211	8.0694
7.6000	7.2833D+06	3.2078	4.8329	8.0953	3.1984	4.7820	8.0352
7.7000	7.2865D+06	3.2127	4.9348	8.2016	3.2009	4.8905	8.1456
7.8000	7.2882D+06	3.2233	5.0230	8.3011	3.2094	4.9751	8.2390
7.9000	7.2887D+06	3.2282	5.0455	8.3284	3.2140	4.9938	8.2625
8.0000	7.2878D+06	3.2248	5.0449	8.3243	3.2115	4.9932	8.2594
8.1000	7.2857D+06	3.2178	5.0249	8.2972	3.2070	4.9740	8.2355
8.2000	7.2837D+06	3.2106	4.9495	8.2136	3.2036	4.8869	8.1450
8.3000	7.2829D+06	3.2092	4.8750	8.1389	3.1984	4.8384	8.0916
8.4000	7.2839D+06	3.2071	4.8510	8.1128	3.1971	4.8128	8.0647
8.5000	7.2868D+06	3.2061	4.8351	8.0949	3.1955	4.7918	8.0411
8.6000	7.2896D+06	3.2139	4.9479	8.2156	3.2050	4.8978	8.1578
8.7000	7.2912D+06	3.2239	5.0339	8.3126	3.2110	4.9860	8.2519
8.8000	7.2917D+06	3.2275	5.0423	8.3244	3.2098	5.0150	8.2784
8.9000	7.2906D+06	3.2228	5.0417	8.3192	3.2065	5.0144	8.2745
9.0000	7.2887D+06	3.2193	4.9978	8.2715	3.2061	4.9573	8.2180
9.1000	7.2869D+06	3.2129	4.9231	8.1906	3.1980	4.8888	8.1404
9.2000	7.2865D+06	3.2083	4.8702	8.1331	3.1982	4.8263	8.0791
9.3000	7.2881D+06	3.2068	4.8505	8.1120	3.1970	4.8095	8.0613
9.4000	7.2911D+06	3.2068	4.8495	8.1101	3.1962	4.8072	8.0573
9.5000	7.2937D+06	3.2174	4.9599	8.2322	3.2034	4.9226	8.1799
9.6000	7.2951D+06	3.2208	5.0542	8.3286	3.2103	4.9965	8.2617
9.6100	7.2952D+06	3.2220	5.0541	8.3297	3.2120	4.9965	8.2633

Table 3.3 Jet pump characteristics in steady flow condition

(a) Flow Ratio ($M = W_S/W_{DR}$)

Items	JP1+JP2			JP3+JP4		
	EXP.	JAERI	Small P.	EXP.	JAERI	Small P.
W_{DR} : Drive Flow Rate (kg/s)	3.11	3.22	3.0	3.08	3.21	3.0
W_S : Suction Flow Rate (kg/s)	4.96	5.05	5.0	5.08	5.00	5.0
M	1.6	1.6	1.7	1.6	1.6	1.7

(b) Total Head Ratio ($N = (H_{DI}-H_S)/(H_{DR}-H_{DI})$)

Items	JP1+JP2			JP3+JP4		
	EXP.	JAERI	Small P.	EXP.	JAERI	Small P.
$P_{DI}-P_S$: Static Pressure (KPa)	76.7	54	-19	78.8	58	-19
$P_{DR}-P_{DI}$: " (")	398.0	408	371	415.9	437	371
U_{DR} : Fluid Velocity (m/s)	1.8	1.8	1.8	1.8	1.8	1.8
U_S : " (")	0*1)	2.9	2.9	0*1)	2.9	2.9
U_{DI} : " (")	2.8	2.8	2.8	2.8	2.8	2.8
ΔP_{DR}: Supplement for Elevation (KPa)	0	-2	-2	0	-2	-2
ΔP_S : " for P. Loss (")	0	-8	-8	0	-8	-8
ΔP_{DI}: " for Elevation (")	0	-4	-4	0	-4	-4
N	0.19	0.15	-0.04	0.19	0.15	-0.04

*1) Pressure is measured at stagnant point.

Table 3.4 Abbreviations and illustration in nodalization diagrams

p	Pipe component
b	Branch component
sv	Single volume component
sj	Single junction component
tv	Time dependent volume component
tj	Time dependent junction component
v	Valve component
pu	Pump component
MSL	Main steam line
SRV	Safety relief valve
FWL	Feedwater line
MRP	Main recirvulation pump
//////	Heat structure

Table 3.5 Comparison of M-values (RUN926)

Time		Intact Loop			Broken Loop		
		Exp.	Small Pump	JAERI Jet Pump	Exp.	Small Pump	JAERI Jet Pump
0s	Drive (kg/s)	3.1640	3.1700	3.1700	3.1640	3.1700	3.1700
	Suction (kg/s)	5.0818	4.9400	4.9400	5.0818	4.9400	4.9400
	M-value	1.6061	1.5584	1.5584	1.6061	1.5584	1.5584
1s	Drive (kg/s)	2.3716	1.9846	2.1808			
	Suction (kg/s)	4.2450	5.1245	4.0593			
	M-value	1.7899	2.5821	1.8614			
2s	Drive (kg/s)	1.6645	1.4303	1.6421			
	Suction (kg/s)	2.9514	4.8059	3.2461			
	M-value	1.7731	3.3601	1.9768			
4s	Drive (kg/s)	1.0667	0.88553	1.1020			
	Suction (kg/s)	2.0301	3.8449	2.1226			
	M-value	1.9032	4.3419	1.9261			

Table 3.6 Comparison of N-values (RUN926)

Time			Intact Loop			Broken Loop		
			Exp.	Small Pump	JAERI Jet Pump	Exp.	Small Pump	JAERI Jet Pump
0s	$P_{dis}-P_{suc}$	(KPa)	81.04	-31.73	58.64	82.28	-26.81	60.95
	$P_{dri}-P_{dis}$	(KPa)	395.2	411.3	409.4	446.2	409.5	421.7
	N-value		0.2051	-0.07715	0.1432	0.1844	-0.06547	0.1445
1s	$P_{dis}-P_{suc}$	(KPa)	29.39	12.79	24.11			
	$P_{dri}-P_{dis}$	(KPa)	132.1	219.9	230.6			
	N-value		0.2225	0.05816	0.1046			
2s	$P_{dis}-P_{suc}$	(KPa)	17.62	10.10	15.15			
	$P_{dri}-P_{dis}$	(KPa)	67.57	116.9	128.5			
	N-value		0.2608	0.08640	0.1179			
4s	$P_{dis}-P_{suc}$	(KPa)	7.616	7.917	5.846			
	$P_{dri}-P_{dis}$	(KPa)		49.08	52.77			
	N-value			0.1613	0.1108			

Table 3.7 Comparison of M-values (RUN912)

Time		Intact Loop			Broken Loop		
		Exp.	Small Pump	JAERI Jet Pump	Exp.	Small Pump	JAERI Jet Pump
0s	Drive (kg/s)	3.1894	3.1700	3.1700	3.1894	3.1700	3.1700
	Suction (kg/s)	5.0918	4.9400	4.9400	5.1031	4.9400	4.9400
	M-value	1.5965	1.5584	1.5584	1.6000	1.5584	1.5584
2s	Drive (kg/s)	1.8556	1.4300	1.6070	1.8556	1.3969	1.5724
	Suction (kg/s)	2.5516	4.3510	2.5659	2.6676	4.3320	2.4693
	M-value	1.3751	3.0427	1.5967	1.4376	3.1012	1.5704
4s	Drive (kg/s)	1.0728	0.91625	1.0960	1.0728	0.87756	1.0565
	Suction (kg/s)		3.6710	1.7218		3.6477	1.6309
	M-value		4.0065	1.5710		4.1566	1.5437
8s	Drive (kg/s)		0.54040	0.70745		0.49545	0.66680
	Suction (kg/s)		2.8048	1.3145		2.7804	1.2255
	M-value		5.1902	1.8581		5.6119	1.8379
12s	Drive (kg/s)		0.39614	0.54499		0.34578	0.50580
	Suction (kg/s)		2.4602	1.0613		2.4291	0.98556
	M-value		6.2104	1.9474		7.0250	1.9485

Table 3.8 Comparison of N-values (RUN912)

Time		Intact Loop			Broken Loop		
		Exp.	Small Pump	JAERI Jet Pump	Exp.	Small Pump	JAERI Jet Pump
0s	$P_{dis}-P_{suc}$ (KPa)	78.85	-33.73	58.49	80.85	-28.50	61.25
	$P_{dri}-P_{dis}$ (KPa)	398.2	407.2	408.7	447.5	437.4	436.8
	N-value	0.1980	-0.08283	0.1431	0.1807	-0.06516	0.1402
2s	$P_{dis}-P_{suc}$ (KPa)	22.73	14.70	20.04	25.08	16.34	20.65
	$P_{dri}-P_{dis}$ (KPa)	74.19	112.5	122.3	317.2	107.7	116.1
	N-value	0.3064	0.1307	0.1639	0.07906	0.1517	0.1779
4s	$P_{dis}-P_{suc}$ (KPa)	9.884	9.696	7.267	11.89	10.87	9.230
	$P_{dri}-P_{dis}$ (KPa)		46.47	52.39	141.6	42.31	48.40
	N-value		0.2087	0.1387	0.08396	0.2569	0.1907
8s	$P_{dis}-P_{suc}$ (KPa)		7.881	2.250		8.298	2.104
	$P_{dri}-P_{dis}$ (KPa)		12.62	17.00		10.24	14.00
	N-value		0.6245	0.1324		0.8104	0.1503
12s	$P_{dis}-P_{suc}$ (KPa)		4.231	2.751		4.794	3.166
	$P_{dri}-P_{dis}$ (KPa)						
	N-value						

Table 3.9 Input data for BWR jet pump model

```
      ----*----1----*----2----*----3----*----4----*----5----*----6----*----7--
082700 *                                                                      *
082701 ************************************************************************
082702 *   INTACT JET PUMP MIXING PART     (EL6.509--EL8.107)                 *
082703 *                                                                      *
082704 1800000   C180    JETPUMP              * JAERI JET PUMP MODEL          *
082705 1800001   3       1                                                    *
082706 1800101   0.0  0.6071 0.1513 0.0  -90.0  -0.6071 0.00005  0.1626  00   *
082707 1800200   3    6.5000+6      552.6                                     *
082708 1800301   0.20    0.1793  0.07044  0.219   0.13    0.1626  0.163      *
082709 1800401   0.20    0.2433  0.0      0.1     0.5071                     *
082710 1800501   0.1     0.024   0.1      0.024   0.024   0.024              *
082711 1800601   12                                                         *
082712 1801101   160010000  180000000  0.04676  0.8   3.0   0000           *
082713 1802101   171010000  180000000  0.2023   0.0   0.00  0000           *
082714 1803101   180010000  185000000  0.249    0.0   0.0   0000           *
082715 1801201   2.245+3    0.0   0.0                                       *
082716 1802201   5.475+3    0.0   0.0                                       *
082726 1803201   7.720+3    0.0   0.0                                       *
082800 ************************************************************************

099701 ************************************************************************
099702 *                                                                      *
099703 *   BROKEN JET PUMP MIXING PART   (EL6.509--EL8.107)                   *
099704 *                                                                      *
099705 2400000   C240    JETPUMP              *JAERI JET PUMP MODEL          *
099706 2400001   3     1                                                      *
099707 2400101  0.0  0.6071 0.1513 0.0  -90.0  -0.6071 0.00005  0.1626  00   *
099708 2400200  3    6.5000+6    552.6                                       *
099709 2400301  0.20    0.1793  0.07044  0.219   0.13    0.1626  0.163      *
099710 2400401  0.20    0.2433  0.0      0.1     0.5071                     *
099711 2400501  0.1     0.024   0.1      0.024   0.024   0.024              *
099712 2400601  12                                                         *
099713 2401101  218010000 240000000  0.04676    0.8     3.0     0000       *
099714 2402101  231010000 240000000  0.2023     0.0     0.00    0000       *
099715 2403101  240010000 245000000  0.249      0.0     0.0     0000       *
099716 2401201  2.245+3  0.0     0.0                                       *
099717 2402201  5.475+3  0.0     0.0                                       *
099800 2403201  7.720+3  0.0     0.0                                       *
099900 ************************************************************************
```

Table 3.10 Analytical results of BWR jet pump characteristics (M-N)

(a) Flow Ratio ($M=W_S/W_{DR}$)

Items	t=0s (Rated Value)	t=5s (I. Loop) (Cal. Data)	t=5s (B. Loop) (Cal. Data)
W_{DR} (kg/s)	2245	2262	2351
W_S (kg/s)	5475	3433	3606
M	2.44	1.52	1.53

(b) Total Head Ratio

Items	t=0s (Rated Value)	t=5s (I. Loop) (Cal. Data)	t=5s (B. Loop) (Cal. Data)
P_{DR} (C16002,C218)(MPa)	8.5808	8.4501	8.5474
P_S (C171,C231)(")	7.1581	7.0783	7.0770
P_{DI} (C185,C245)(")	7.4119	7.1872	7.1845
U_{DR} (m/s)	11.2	11.3	11.8
U_S (")	9.6	6.0	6.3
U_{DI} (")	11.9	8.8	9.2
N	0.234	0.097	0.090

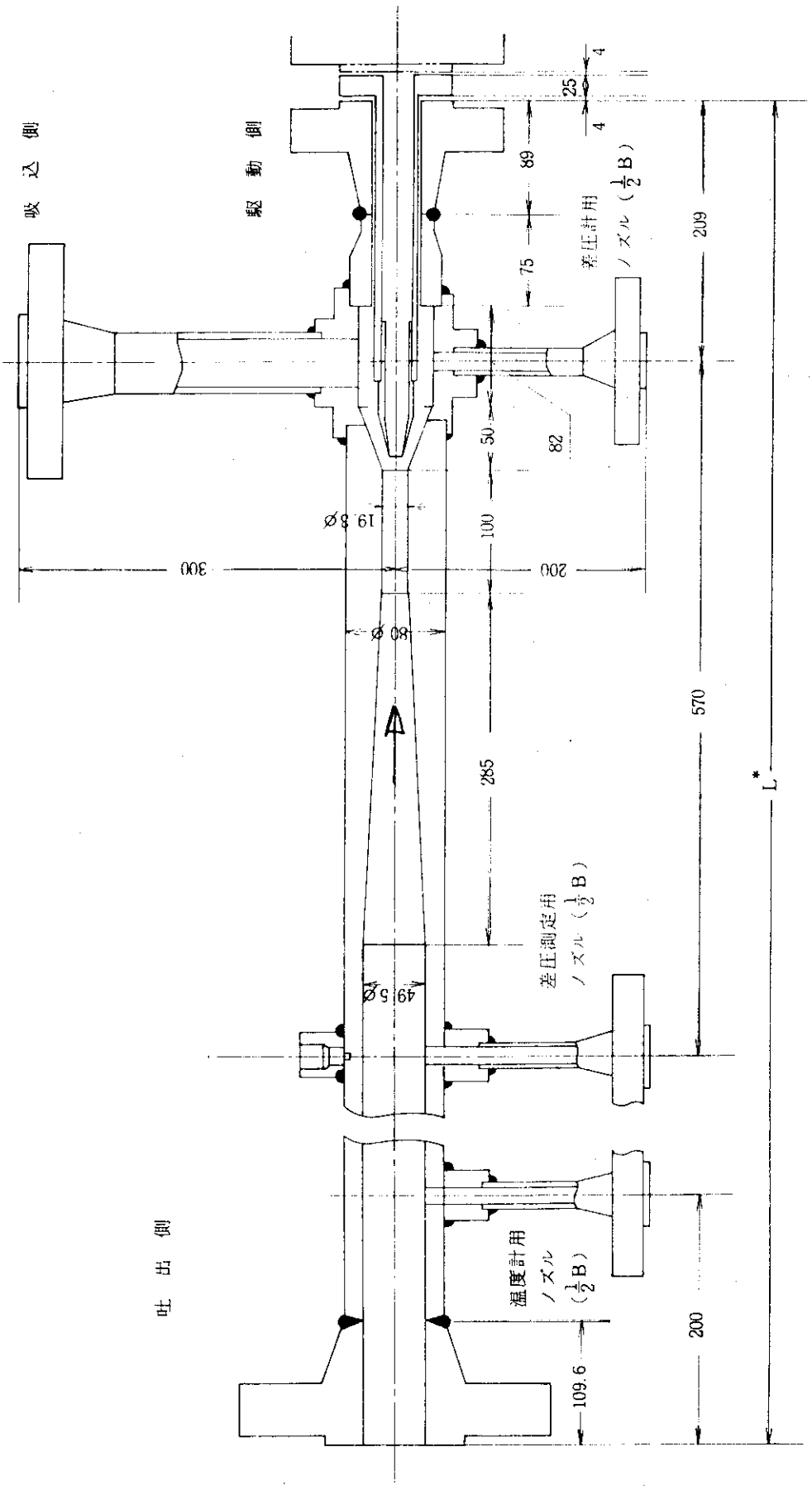
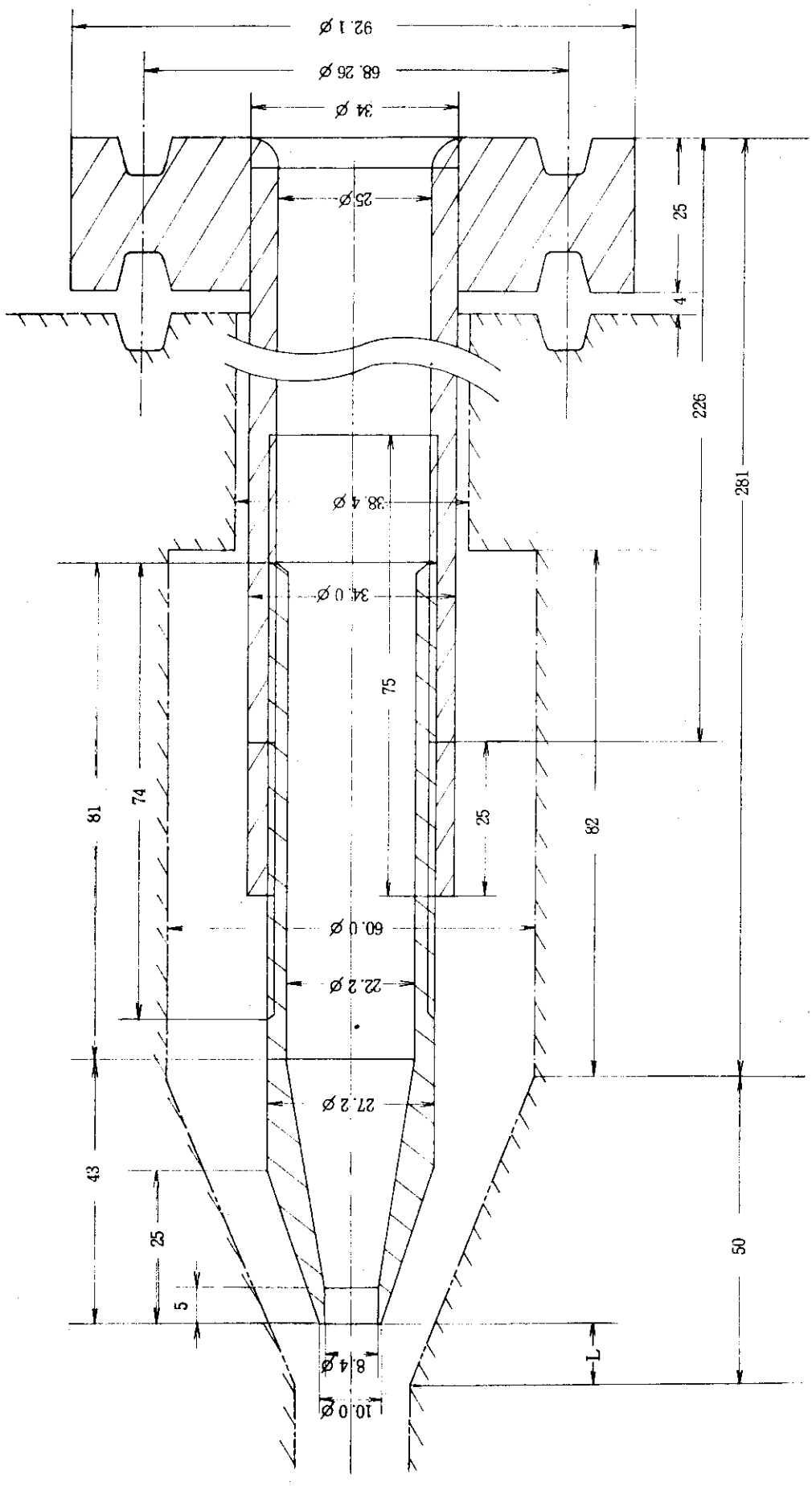


Fig. 3.1 Jet pump in ROSA-III test facility



(L = 8, 12, 17 mm)

Fig. 3.2 Details of nozzle and throat of jet pump

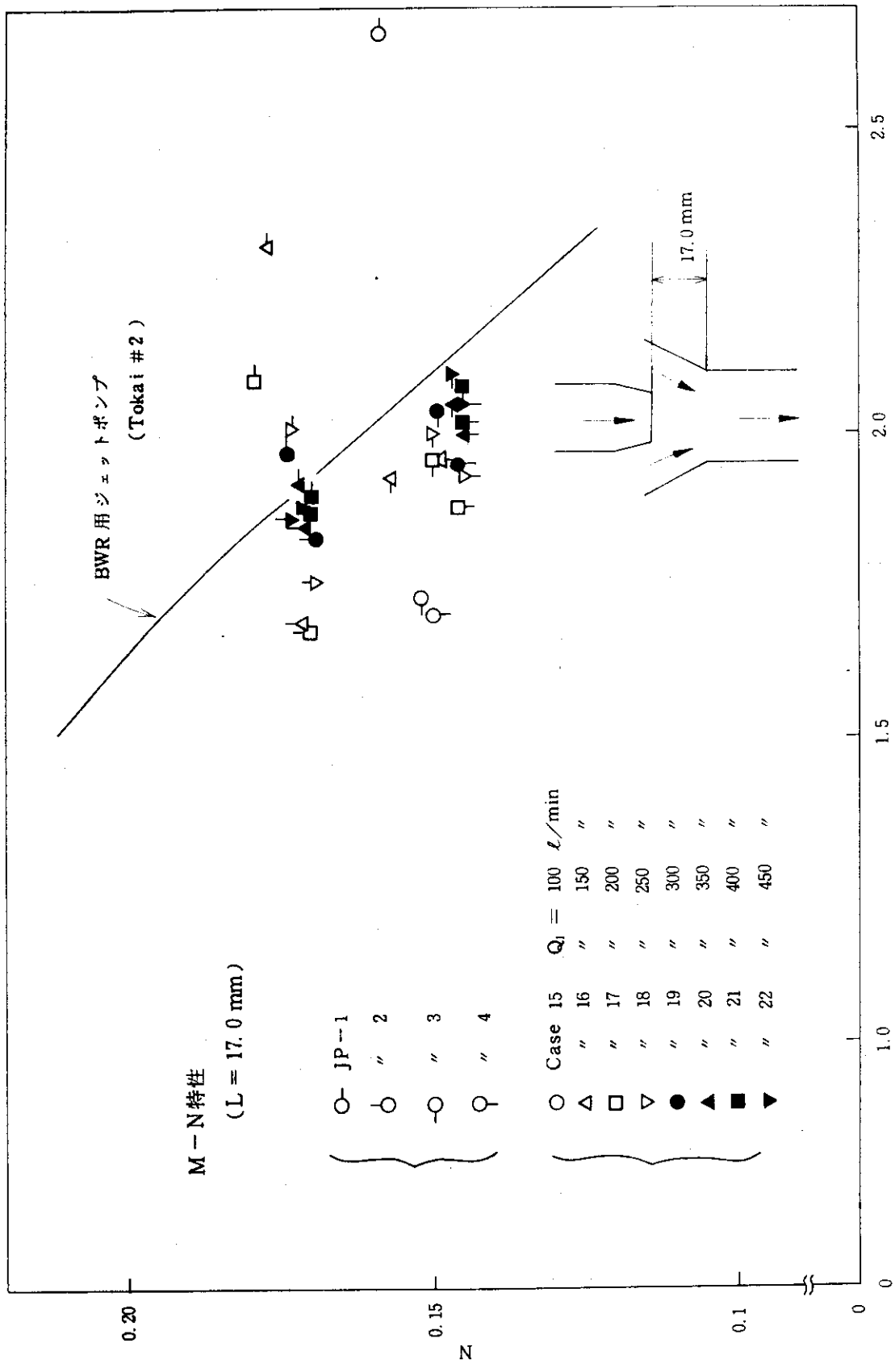
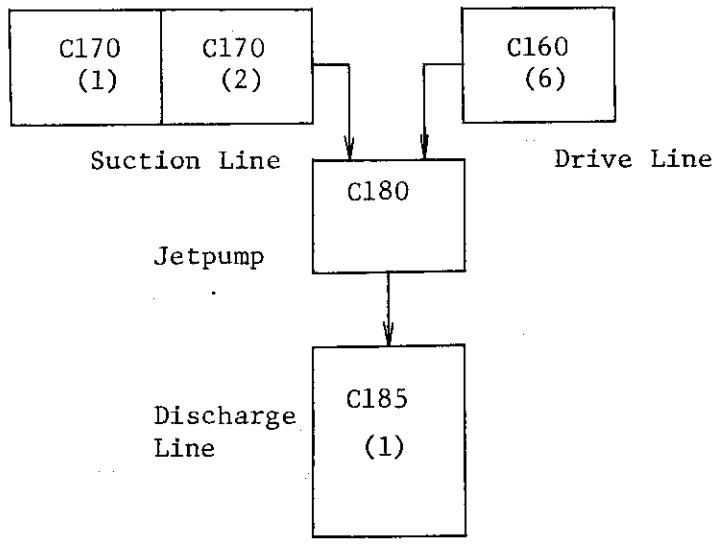
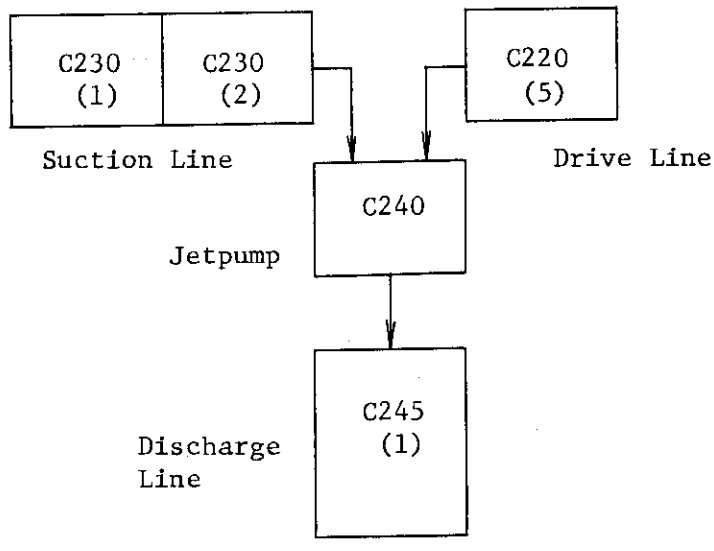


Fig. 3.3 Normal jet pump characteristics in ROSA-III facility



(a) Intact Loop



(b) Broken Loop

Fig. 3.4 Modeling of pipings around jetpumps

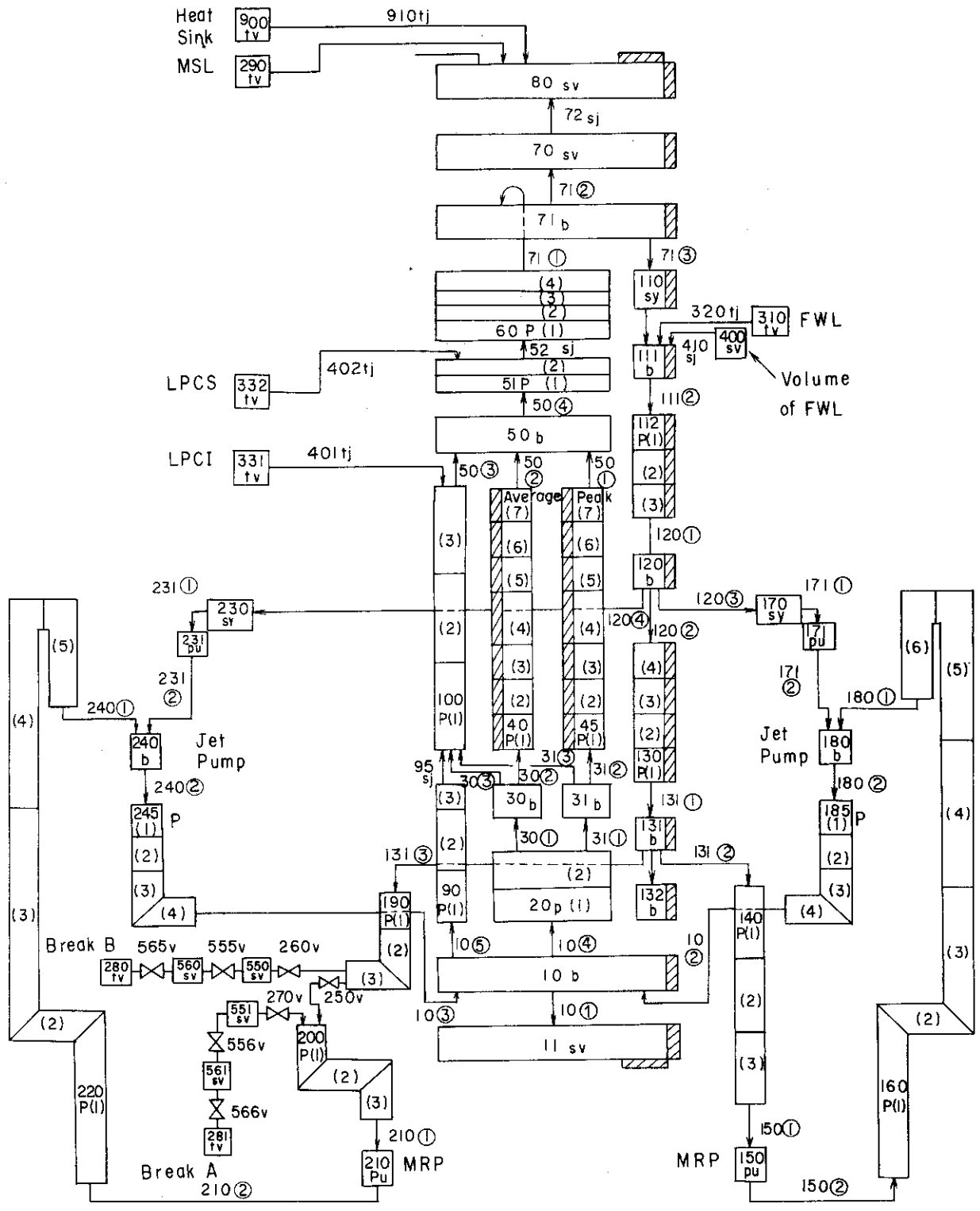


Fig. 3.5(a)　System nodalization diagram (RUN926, Small pump model)

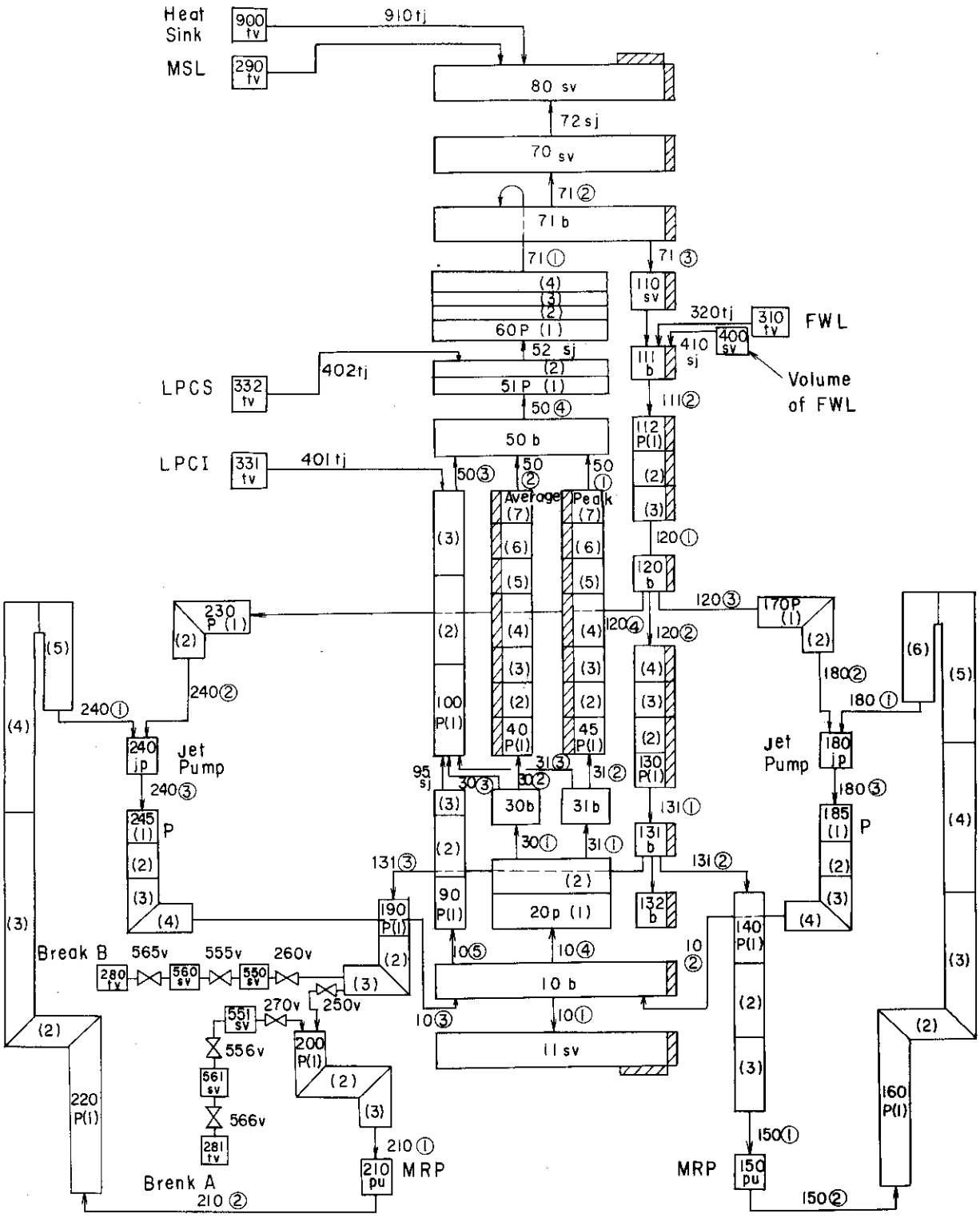


Fig. 3.5(b) System nodalization diagram (RUN926, JAERI jet pump model)

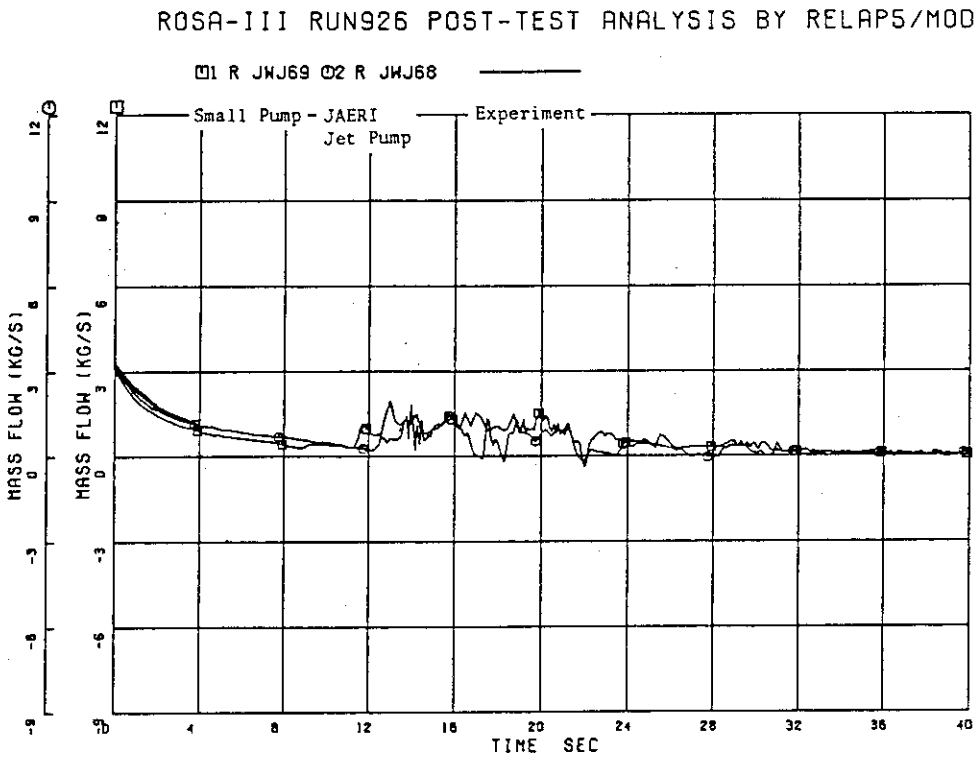


Fig. 3.6(a)　Drive flow rates of intact loop jet pump (RUN926)

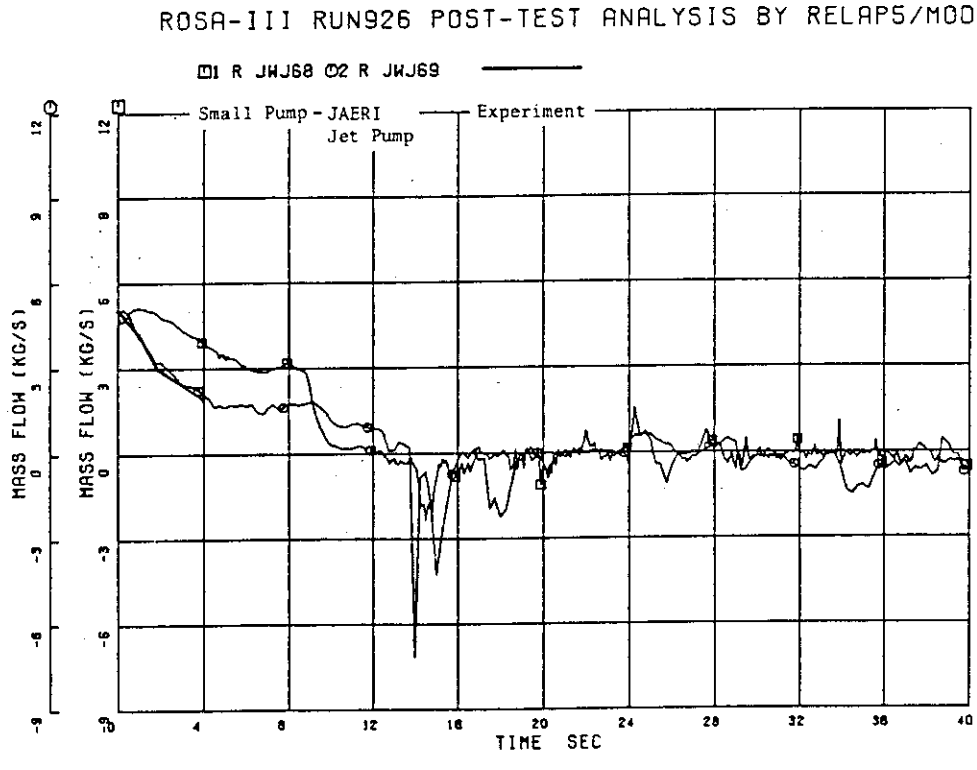


Fig. 3.6(b)　Suction flow rates of intact loop jet pump (RUN926)

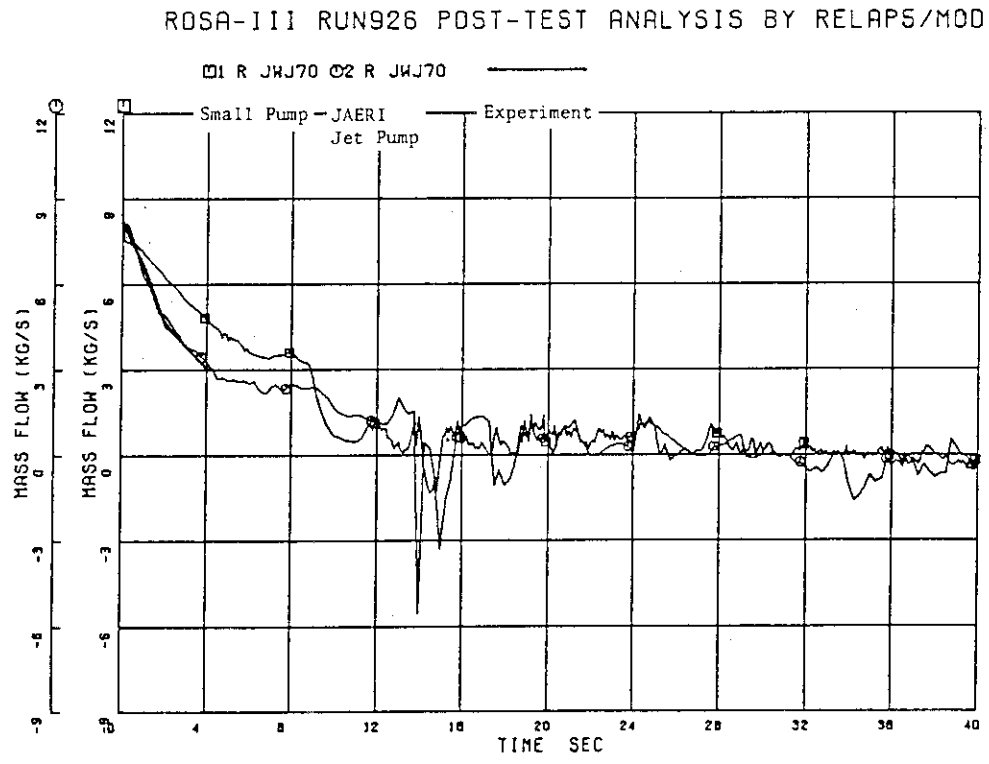


Fig. 3.6(c)　Discharge flow rates of intact loop jet pump (RUN926)

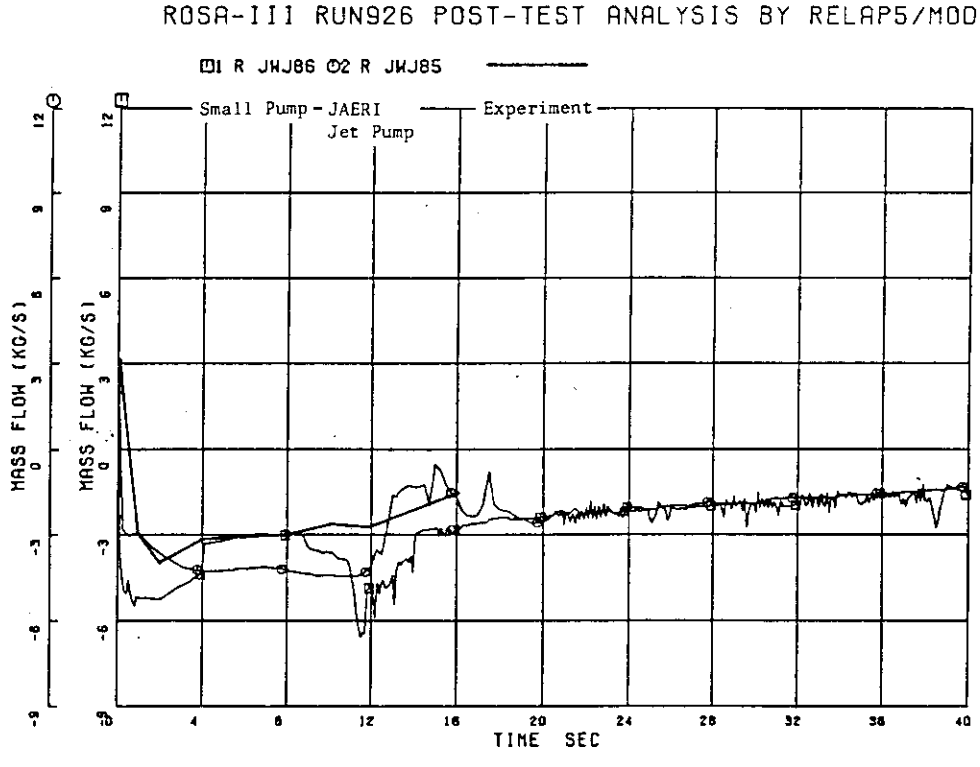


Fig. 3.6(d)　Drive flow rates of broken loop jet pump (RUN926)

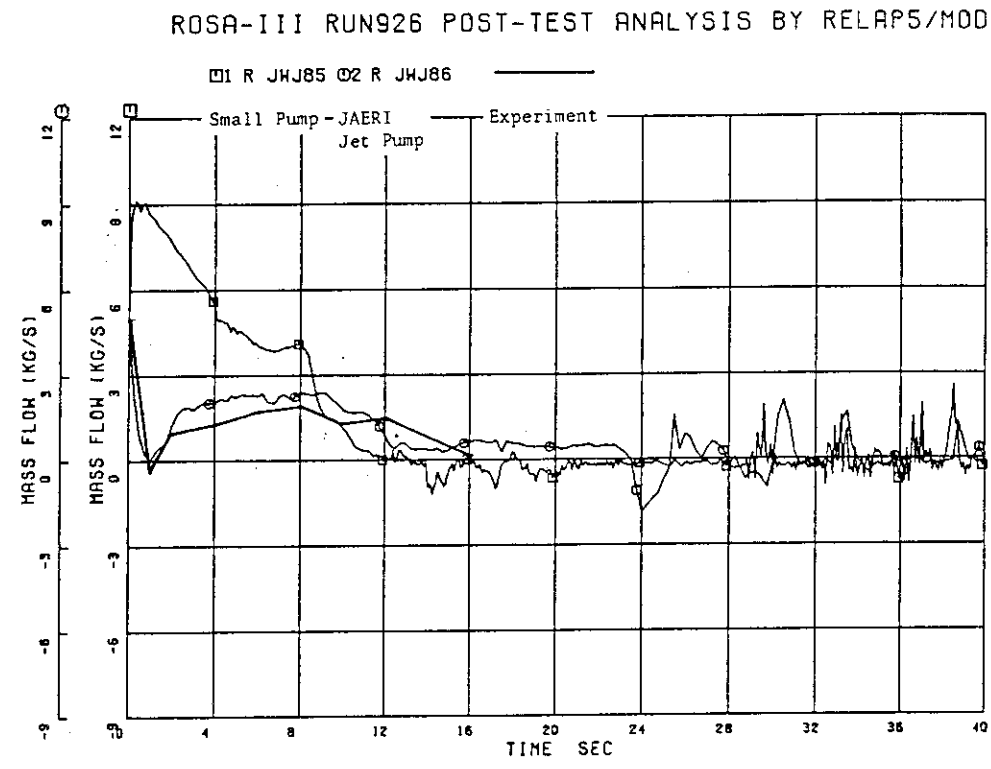


Fig. 3.6(e)　Suction flow rates of broken loop jet pump (RUN926)

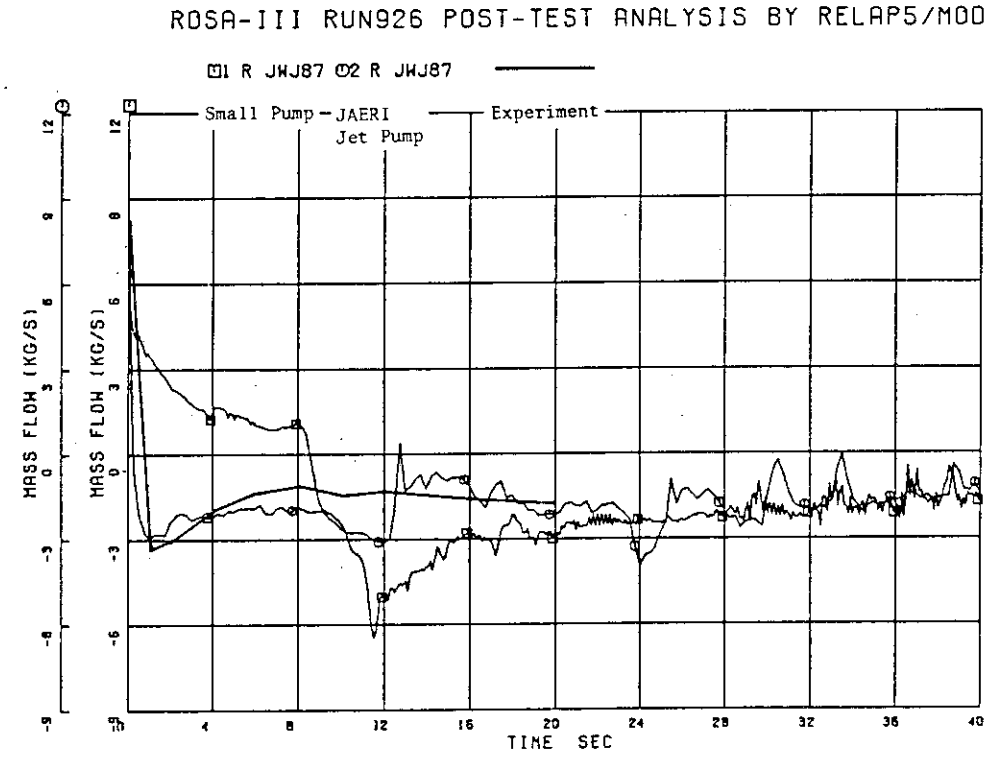


Fig. 3.6(f)　Discharge flow rates of broken loop jet pump (RUN926)

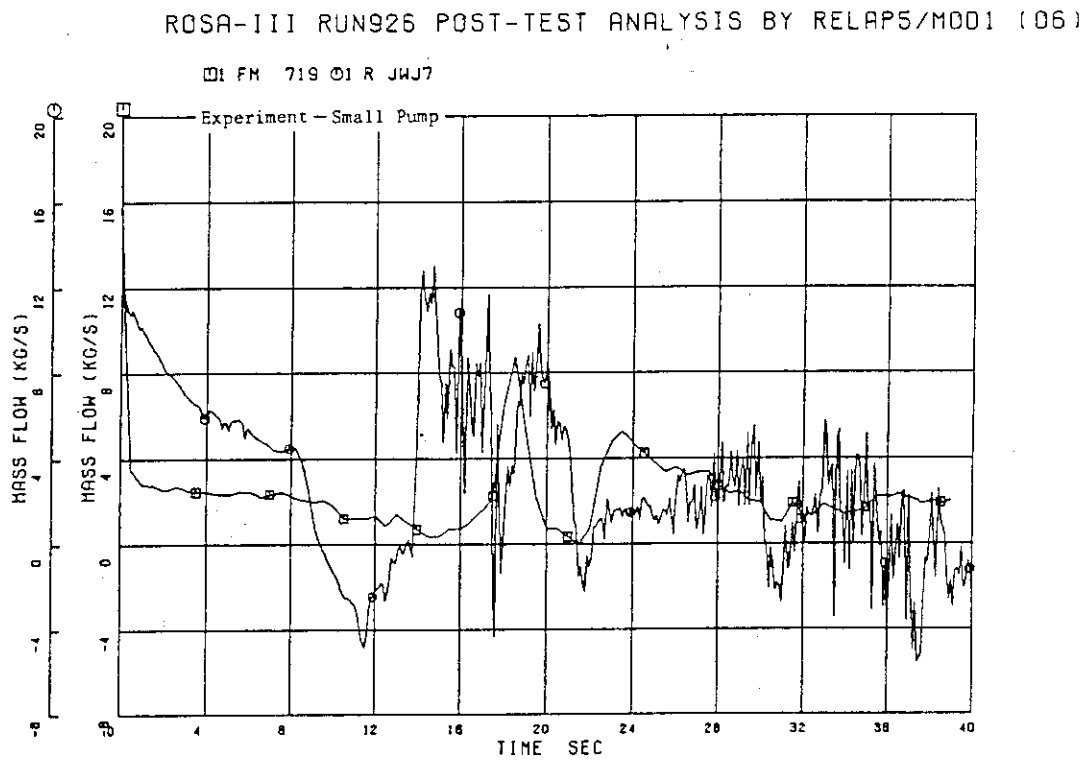


Fig. 3.7(a) Core inlet flow rates in experiment and small pump model (RUN926)

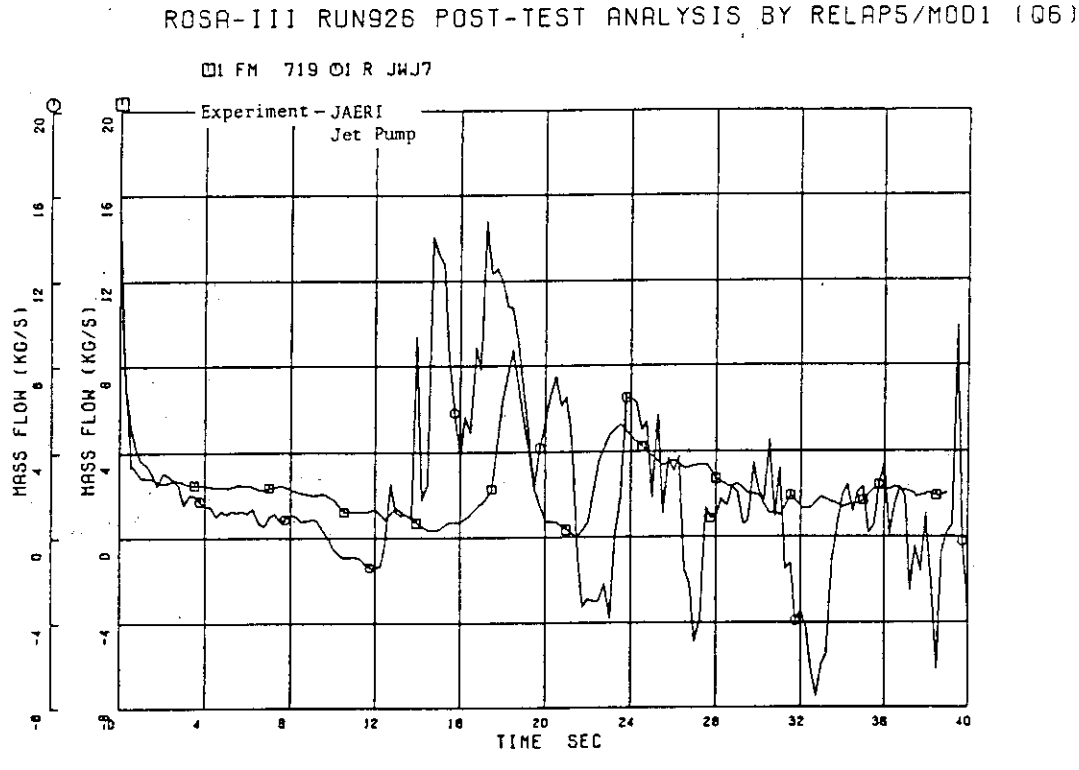


Fig. 3.7(b) Core inlet flow rates in experiment and JAERI jet pump model (RUN926)

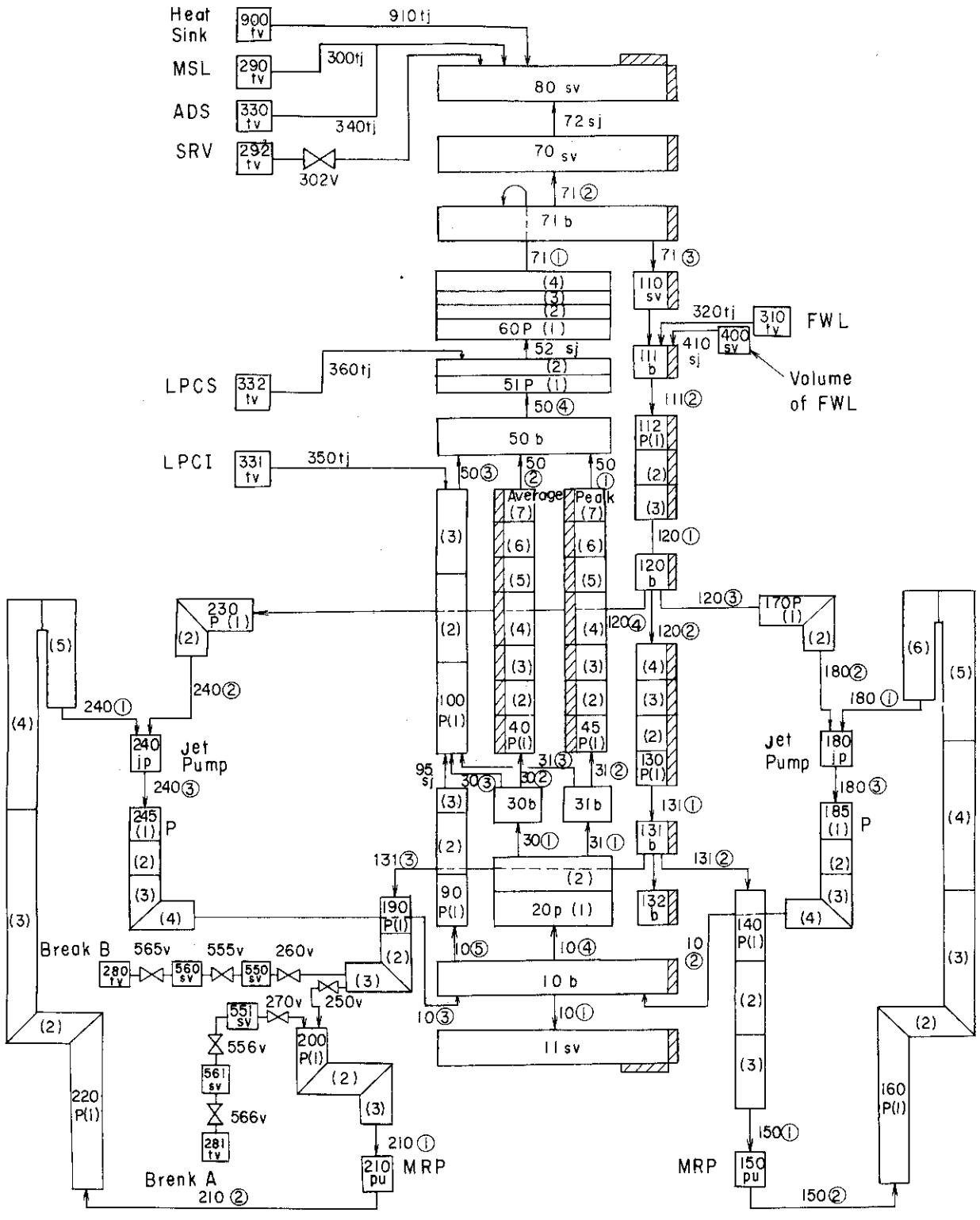


Fig. 3.8(a)　System nodalization diagram (RUN912, Small pump model)

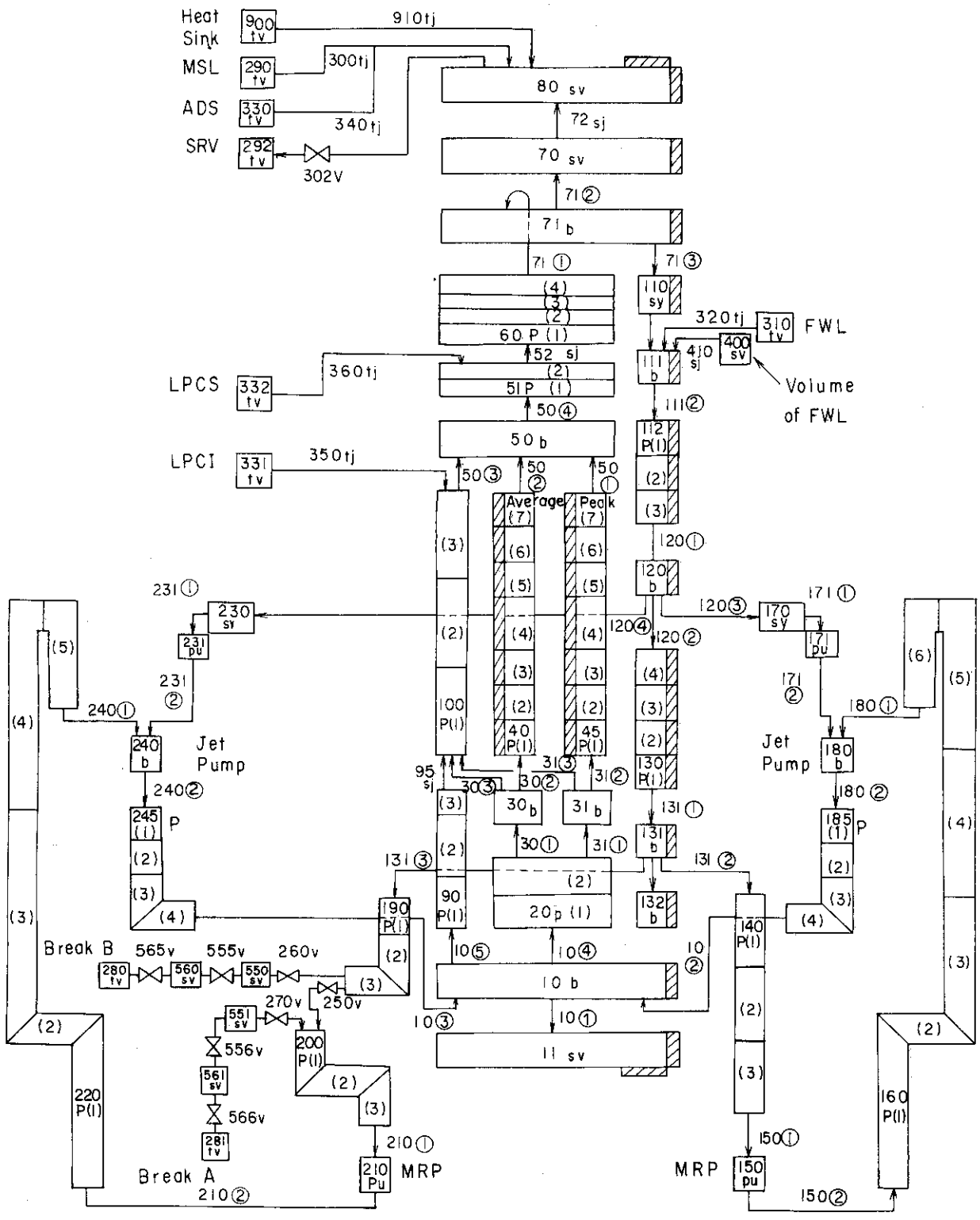


Fig. 3.8(b) System nodalization diagram (RUN912, JAERI jet pump model)

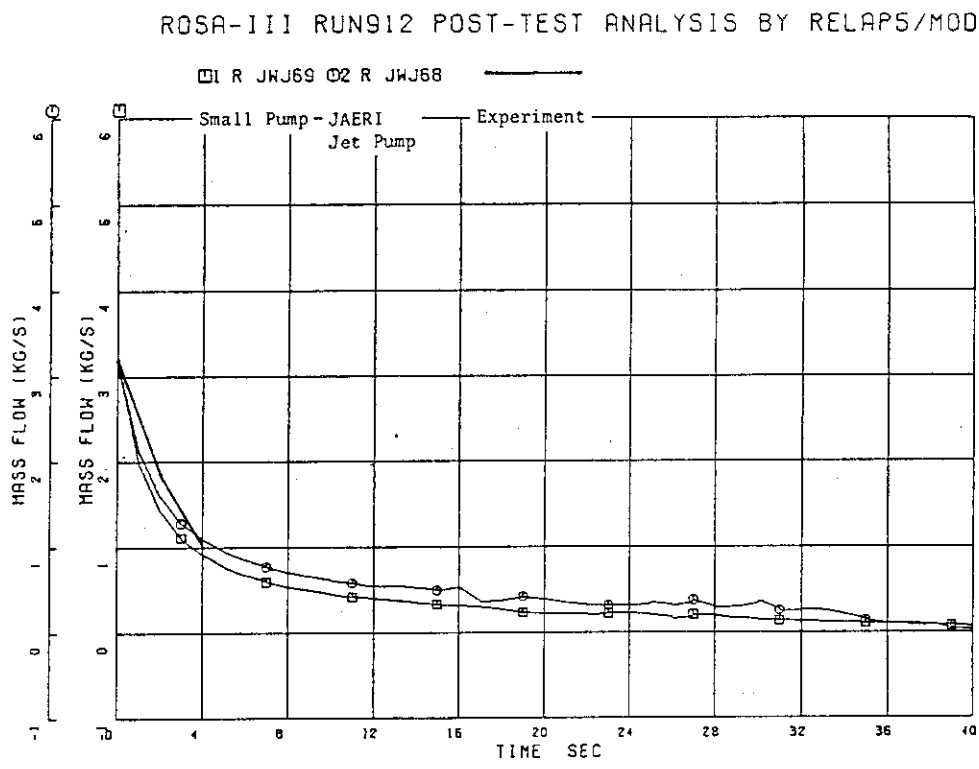


Fig. 3.9(a)　Drive flow rates of intact loop jet pump (RUN912)

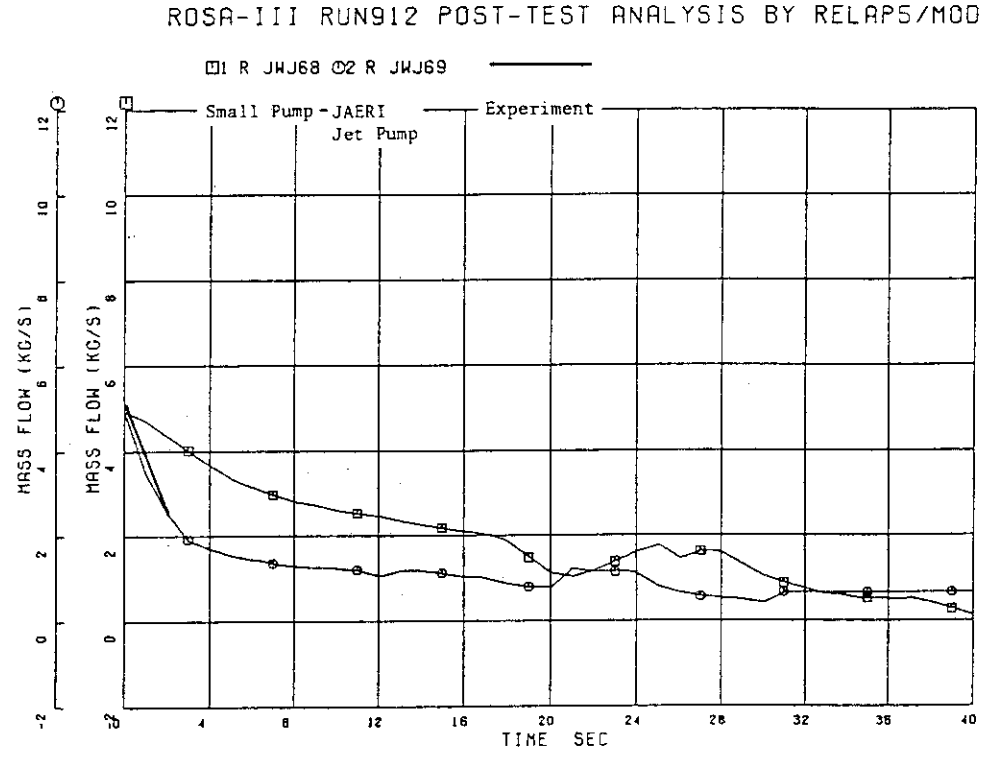


Fig. 3.9(b)　Suction flow rates of intact loop jet pump (RUN912)

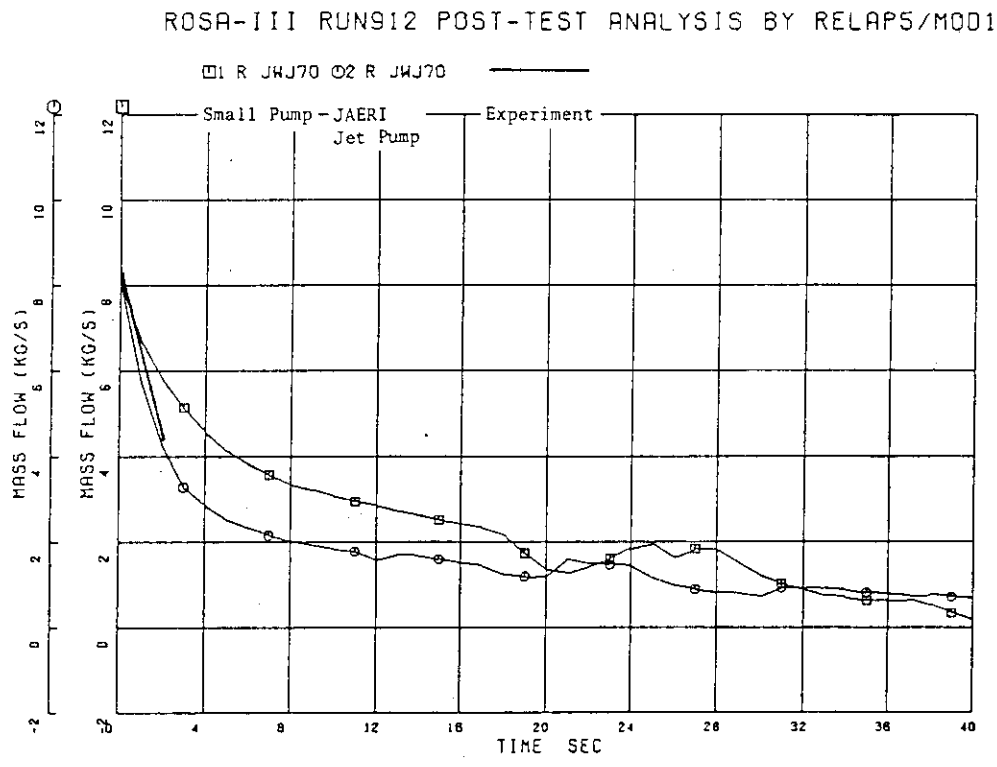


Fig. 3.9(c) Discharge flow rates of intact loop jet pump (RUN912)

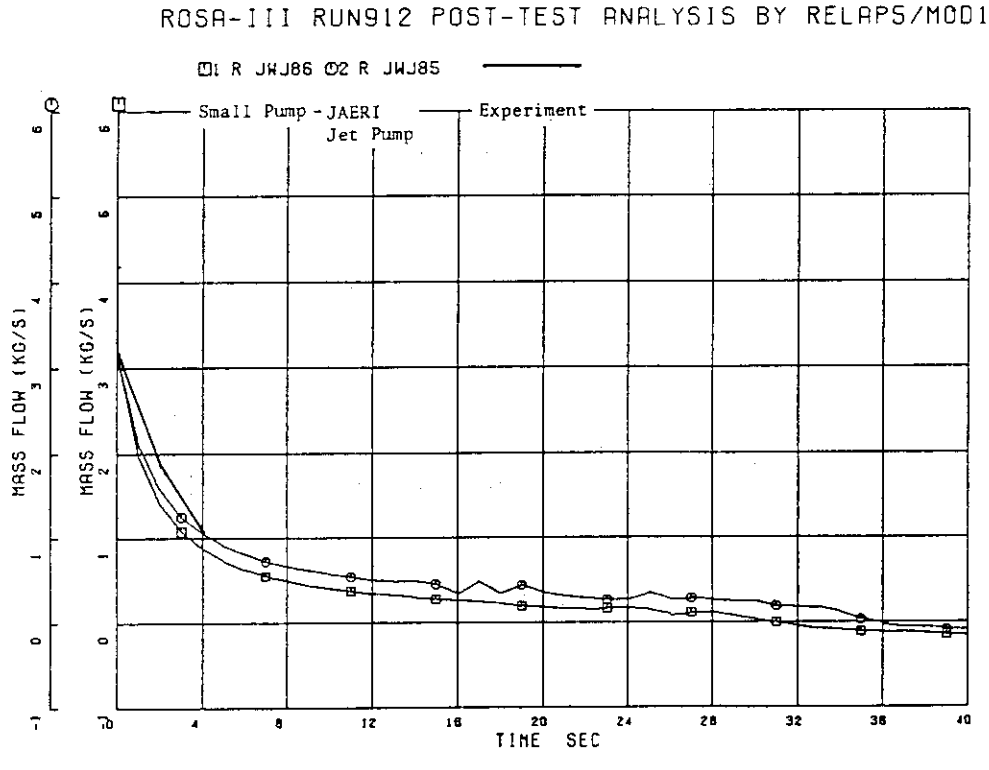


Fig. 3.9(d) Drive flow rates of broken loop jet pump (RUN912)

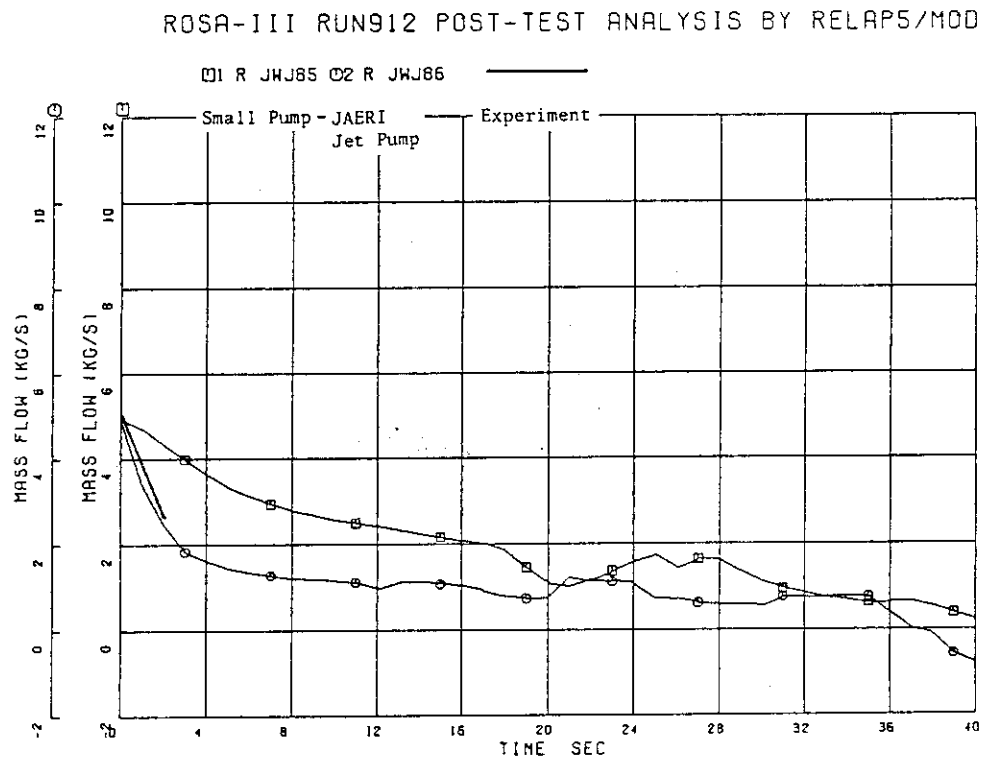


Fig. 3.9(e) Suction flow rates of broken loop jet pump (RUN912)

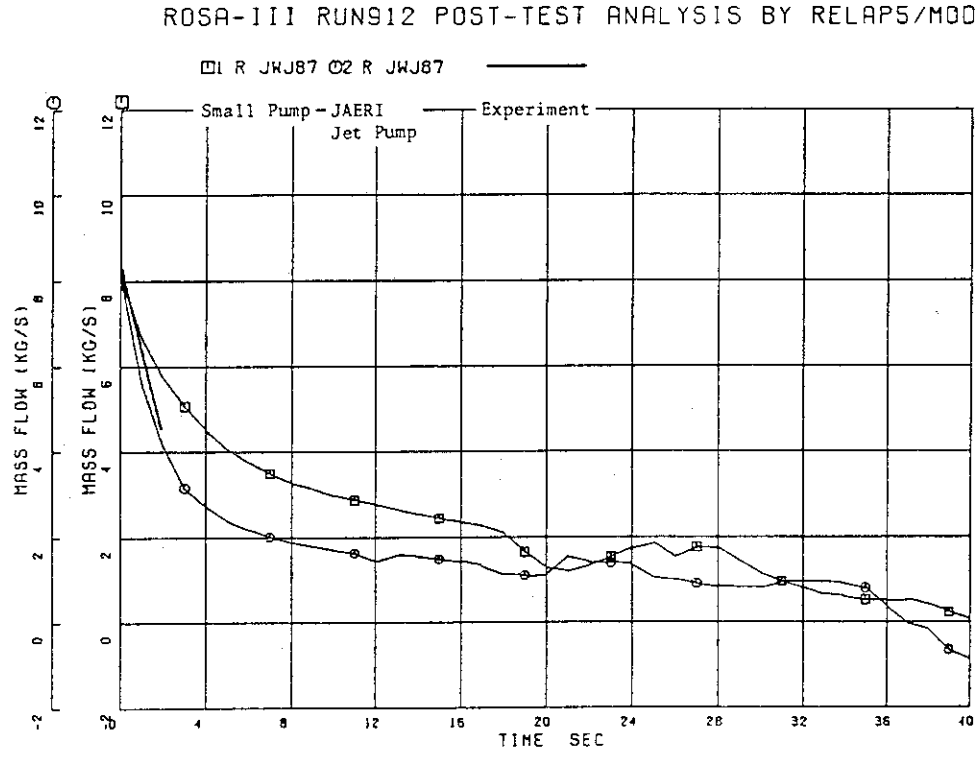


Fig. 3.9(f) Discharge flow rates of broken loop jet pump (RUN912)

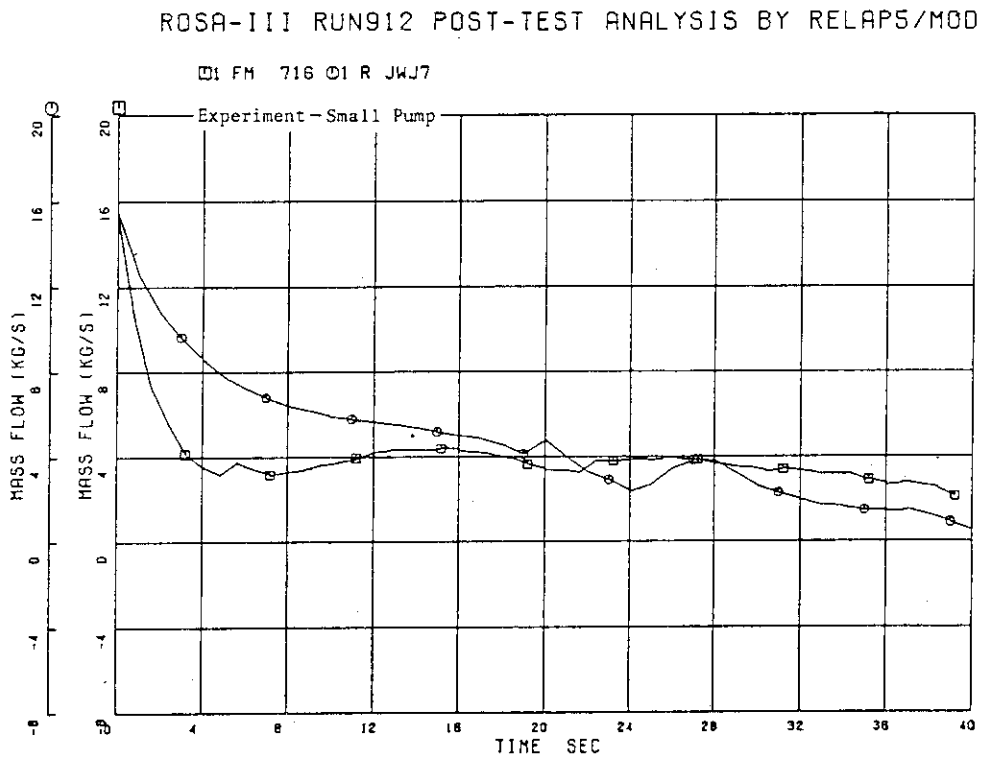


Fig. 3.10(a) Core inlet flow rates in experiment and small pump model (RUN912)

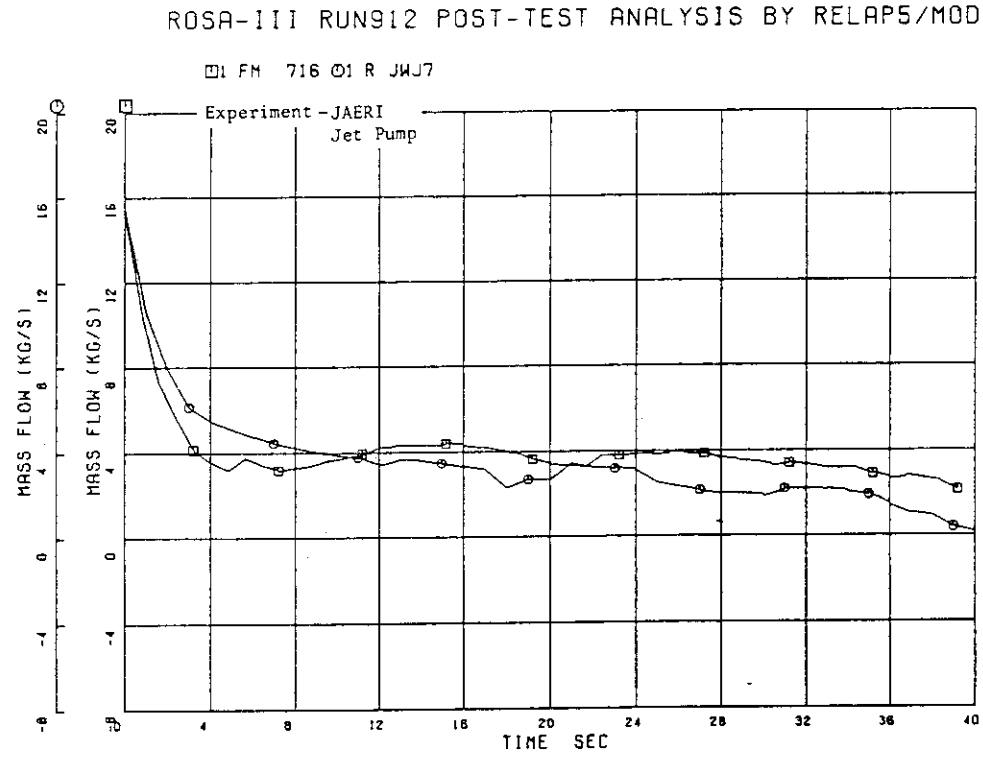


Fig. 3.10(b) Core inlet flow rates in experiment and JAERI jet pump model (RUN912)

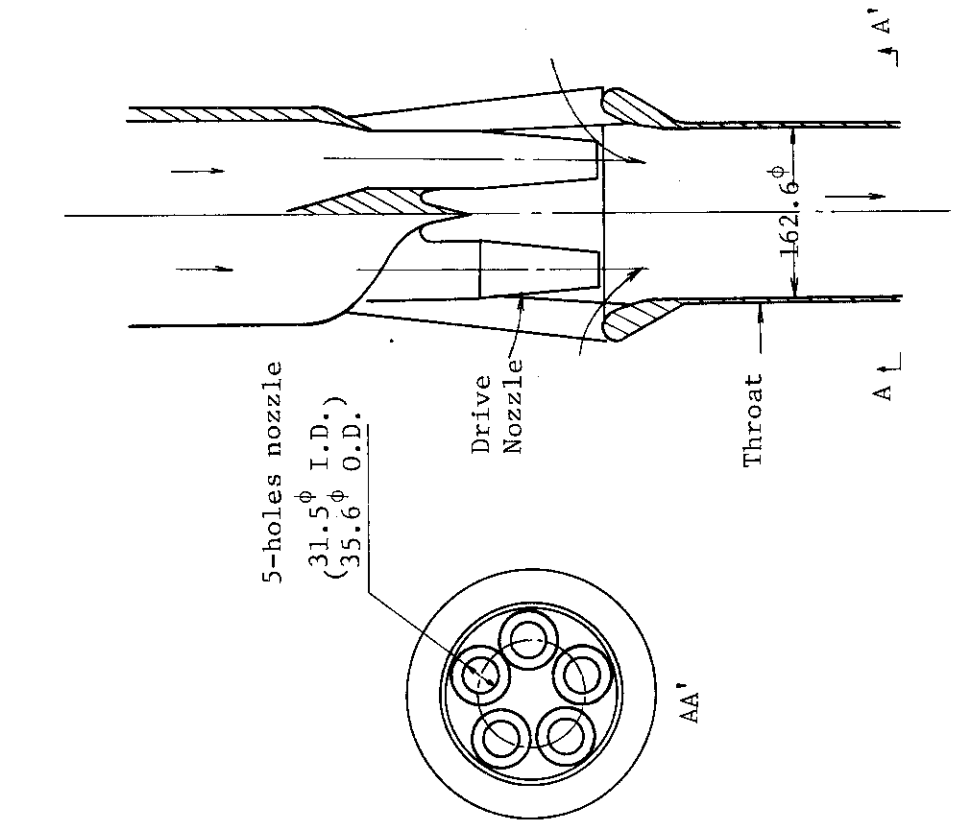


Fig. 3.12 Geometry of nozzles and throat of BWR jet pump

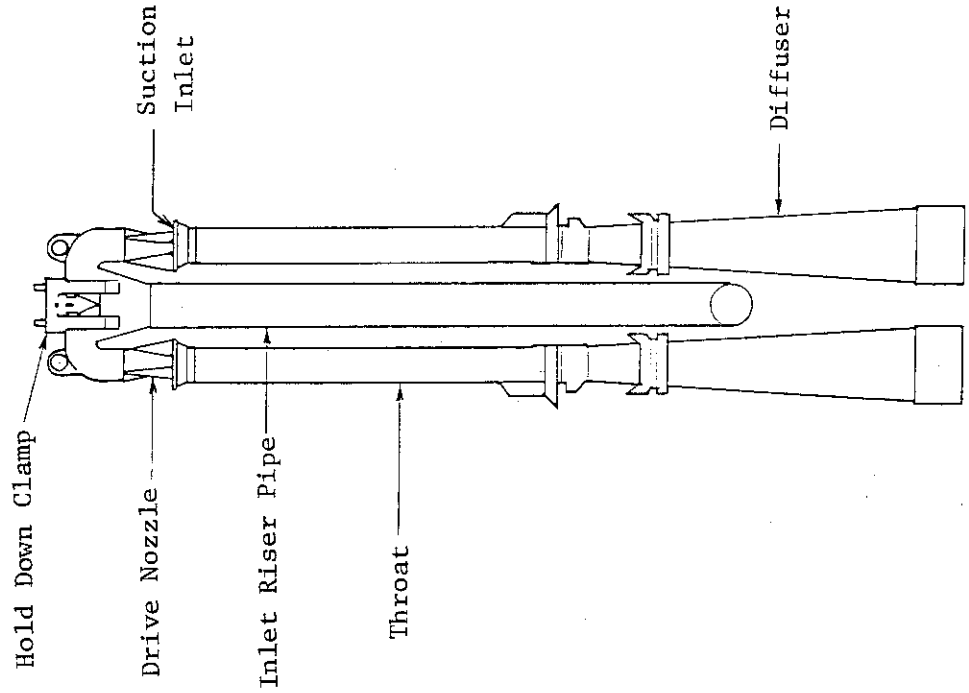


Fig. 3.11 Overview of BWR jet pump

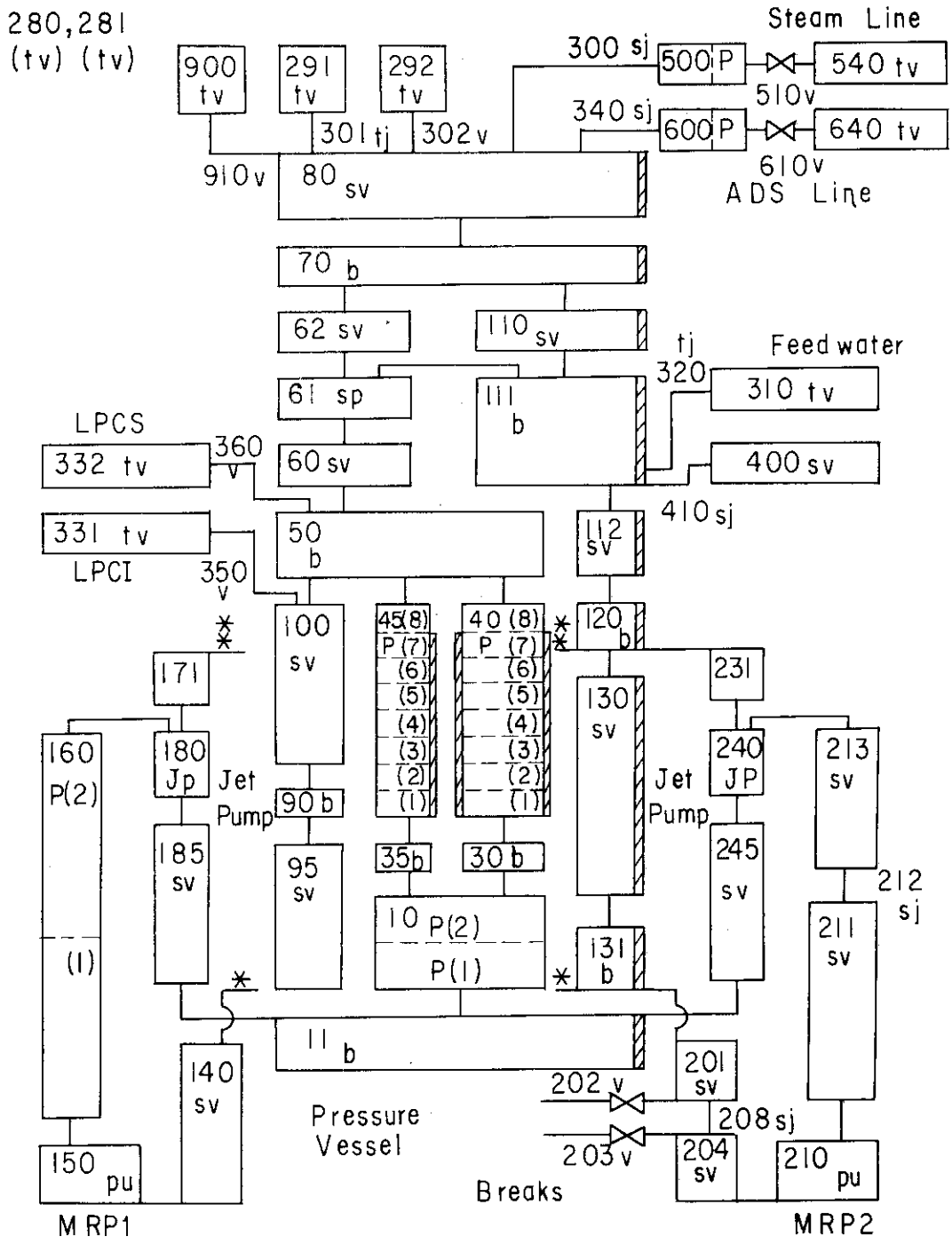


Fig. 3.13 BWR system simulation by RELAP5 code

4. 結　　言

RELAP 5／MOD 1コード用に開発された原研ジェットポンプモデルを改良し，ジェットポンプを装備しているROSA－Ⅲ試験装置およびBWRシステムにおけるジェットポンプ内の流れの解析を行えるようにした。本モデルの性能については，ROSA－Ⅲの実験データを用いて評価し，次の結論が得られた。

(1) 本モデルは，ROSA－Ⅲにおける定常時の水単相ジェットポンプ特性（駆動流と吸込流の流量比と全圧力の変化）を正しく予測する。

(2) ROSA－Ⅲの大破断および小破断実験における，破断後のジェットポンプを流れる水単相流の過渡変化については，本モデルで仮定されている条件（流れは正流，吸込部は未飽和状態）下でよく予測することができる。破断初期のジェットポンプ流れを正しく予測することは，圧力容器内の冷却材インベントリ分布の正確な予測に役立ち，従って炉心の燃料表面温度挙動の予測精度上げることに寄与する。

(3) 本モデルと比較した場合，従来便宜的に使用してきた小ポンプモデル（ジェットポンプ吸込部に小ポンプを設け，吸込流を駆動するもの）は吸込流量を過大評価し，従って炉心流量も過大評価していた。小ポンプのコーストダウン時の吸込流量は，種々のポンプパラメータを選ぶことにより改善はされうるが，ジェットポンプ周りの圧力分布等を予測することはモデルの本質上できないものである。

(4) 本モデルをBWRの5ホールノズルを装備したジェットポンプに適用する場合，スロート径（d_4）に実際のスロート径の80％の値を用いると，ジェットポンプの定常流特性が改善されることがわかった。これは，5ホールノズルの場合に駆動流と吸込流の接触面積が増え，しかも主にスロート外周部で吸込流を駆動するため，有効スロート径が小さい場合に相当するものと考えられる。

謝　辞

本報を完成させる上で，原研安全工学部主任研究員安達公道氏より適切な助言と御指導を頂いたことを記し，ここに謝意を表明します。

4. 結　　言

RELAP 5／MOD 1コード用に開発された原研ジェットポンプモデルを改良し，ジェットポンプを装備しているROSA－Ⅲ試験装置およびBWRシステムにおけるジェットポンプ内の流れの解析を行えるようにした。本モデルの性能については，ROSA－Ⅲの実験データを用いて評価し，次の結論が得られた。

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(2) ROSA－Ⅲの大破断および小破断実験における，破断後のジェットポンプを流れる水単相流の過渡変化については，本モデルで仮定されている条件（流れは正流，吸込部は未飽和状態）下でよく予測することができる。破断初期のジェットポンプ流れを正しく予測することは，圧力容器内の冷却材インベントリ分布の正確な予測に役立ち，従って炉心の燃料表面温度挙動の予測精度上げることに寄与する。

(3) 本モデルと比較した場合，従来便宜的に使用してきた小ポンプモデル（ジェットポンプ吸込部に小ポンプを設け，吸込流を駆動するもの）は吸込流量を過大評価し，従って炉心流量も過大評価していた。小ポンプのコーストダウン時の吸込流量は，種々のポンプパラメータを選ぶことにより改善はされうるが，ジェットポンプ周りの圧力分布等を予測することはモデルの本質上できないものである。

(4) 本モデルをBWRの5ホールノズルを装備したジェットポンプに適用する場合，スロート径（d_4）に実際のスロート径の80％の値を用いると，ジェットポンプの定常流特性が改善されることがわかった。これは，5ホールノズルの場合に駆動流と吸込流の接触面積が増え，しかも主にスロート外周部で吸込流を駆動するため，有効スロート径が小さい場合に相当するものと考えられる。

謝　辞

本報を完成させる上で，原研安全工学部主任研究員安達公道氏より適切な助言と御指導を頂いたことを記し，ここに謝意を表明します。

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付録 1. RELAP5コードによるROSA-III実験解析結果

(1) 大破断実験解析

3.3節で述べたように，ジェットポンプモデルは，特に破断初期に重要となるものであり，また，原研ジェットポンプモデルによる解析で本モデルが使用されたのは破断初期のみである。しかし，破断初期の解析結果は，その後の長時間LOCA解析の結果に影響を及ぼす。そこで，ここでは，原研ジェットポンプモデルを組込んだRELAP 5／MOD 1 (CY 1) コードによりRUN 926の長時間LOCA解析を行った結果について述べる。以下では，BWR／LOCA現象を理解するのに重要となる3つの物理量，圧力，水位および燃料棒表面温度に分けて示す。

図A 1.1に下部プレナムの圧力変化の比較を示す。破断後の圧力低下，主蒸気隔離弁（MS IV）閉鎖による圧力の上昇，再循環ポンプ吸込側配管露出による破断口よりの蒸気放出に伴う圧力の急減少，下部プレナムフラッシングによる圧力減少率の低下等の傾向は，計算結果と実験結果でよく一致している。計算結果の減圧率が実験結果の減圧率より大きく，圧力の絶対値が実験結果より計算結果の方が小さいのは，RELAP 5／MOD 1コードで破断口よりの蒸気の臨界流を大きめに計算するためと考えられる。

図A 1.2に炉心（高出力チャンネルと平均出力チャンネル）の水位変化の比較を示す。RELAP 5／MOD 1コードでは水位が計算されないため，計算値は，各ボリュウムのボイド率が0.96以上，または以下になった場合に，それぞれ水位が低下，または回復したとして求めたものである。下部プレナムフラッシング（LPF）以前の一時的な水位の低下—回復については，計算結果は実験結果の傾向によく一致しており，これは破断初期のジェットポンプ吐出流量の予測が正しいことによる。しかし，下部プレナムフラッシング効果減少後の水位については，高出力チャンネルの計算結果は振動的であり，実験結果との一致はあまりよくない。一方，平均出力チャンネルの計算結果は，水位低下の時刻が実験結果より遅くなってはいるが，傾向は実験結果と一致している。

図A 1.3(a)～(g)およびA 1.4(a)～(g)に，それぞれ高出力チャンネルおよび平均出力チャンネルにおける燃料棒表面温度変化の比較を示す。実験値としては，対応する全燃料棒より得られた表面温度の最大値と最小値をハッチングにより示している。各Positionは，発熱部上端よりPosition 1 : 0.050m（下端より 1.830m），Position 2 : 0.3525m（1.5275m），Position 3 : 0.5875m（1.2925m），Position 4 : 0.940m（0.940m），Position 5 : 1.2925（0.5875m），Position 6 : 1.5275m（0.3525m），Position 7 : 1.830m(0.050m）に対応する（発熱部全長は1.880mである）。燃料棒表面のドライアウトーリウェットの時刻は，対応するボリウムの水位の減少—回復と密接に関係している。3.3節で述べたように，破断初期の炉心入口流量の計算値が実験値とよく一致したため，燃料棒の一時的なドライアウトーリウェット挙動についても，高出力チャンネルの上部および平均出力チャンネルで計算結果と実験結果とはよく一致している。ただし，高出力チャンネルの中央部での両者の一致は必ずしもよくないが，これは，燃料棒の一時的なドライアウトーリウェット挙動の計算には，ジェ

ットポンプモデルの関係する炉心入口流量以外に，限界熱流束（CHF）相関式，DNB後（ドライアウト後）の熱伝達相関式等の熱伝達モデル等も大きく影響するためと考えられる。下部プレナムフラッシング効果減少後のドライアウト挙動については，高出力チャンネルの計算結果では水位変化の振動と対応して温度上昇が小さくなっているが，平均出力チャンネルの計算結果では，温度上昇時刻は遅れているものの温度上昇速度は実験結果と一致している。

以上のように，大破断LOCAでジェットポンプモデルの重要となる下部プレナムフラッシング以前の一時的な水位の低下一回復，燃料棒表面のドライアウトーリウェットについては，原研ジェットポンプモデルによる計算結果は実験結果と比較的よく一致した。また，下部プレナムフラッシング効果減少後のLOCA／ECC現象全体についても，原研ジェットポンプモデルにより基本的熱水力現象はよく模擬できることがわかった。しかし，より正確な計算には，熱伝達等のコード内モデルおよびその使用法の改良が検討される必要がある。

(2) 小破断実験解析

小破断の場合システム内の残存水量の変化が緩やかであるが，ジェットポンプ吐出流量は圧力容器内各部の残存水量の分布に影響する。この意味で，特に破断初期のモデルの評価が重要である。一方，破断初期の残存水量の分布が，その後のシステム全体の熱流体挙動，特に炉心内の燃料温度挙動に及ぼす影響も大きいので，以下に原研ジェットポンプモデルを組込んだRELAP 5／MOD 1コードによるRUN 912の長時間LOCA解析結果から，この点について検討した結果を示す。

図A 1.5に下部プレナムの圧力変化の比較を示す。破断後の圧力低下，MSIV閉鎖による圧力の上昇，安全弁作動による8.3 MPaでの圧力の保持，ADS作動後の圧力の急減少等，計算結果は実験結果とよく一致している。

図A 1.6に炉心の水位変化の比較を示す。下部プレナムフラッシング（LPF）以前の一時的な水位の低下一回復，下部プレナムフラッシング効果減少後の水位の低下一リフラッドについては，計算結果と実験結果で，それらの時刻には相異があるが，傾向はよく一致している。計算結果では，炉心の下部（Position 6および7）の露出は起こっていない。

図A 1.7(a)～(g)およびA 1.8(a)～(g)に，それぞれ高出力チャンネルおよび平均出力チャンネルにおける燃料棒表面温度変化の比較を示す。下部プレナムフラッシング効果減少後のドライアウト時刻は，計算結果の方が実験結果より遅く，また，ECCS作動後のクエンチの時刻は，計算結果の方が実験結果より早くなっている。しかし，ドライアウト後の温度上昇速度およびドライアウトーリウェット・クエンチの傾向については，計算結果は実験結果とよく一致している。

以上のように，原研ジェットポンプモデルを組込んだRELAP 5／MOD 1コードにより，小破断LOCA時の熱水力挙動を破断直後のみでなくLOCA／ECC現象全体にわたりよく計算できることが明らかとなった。

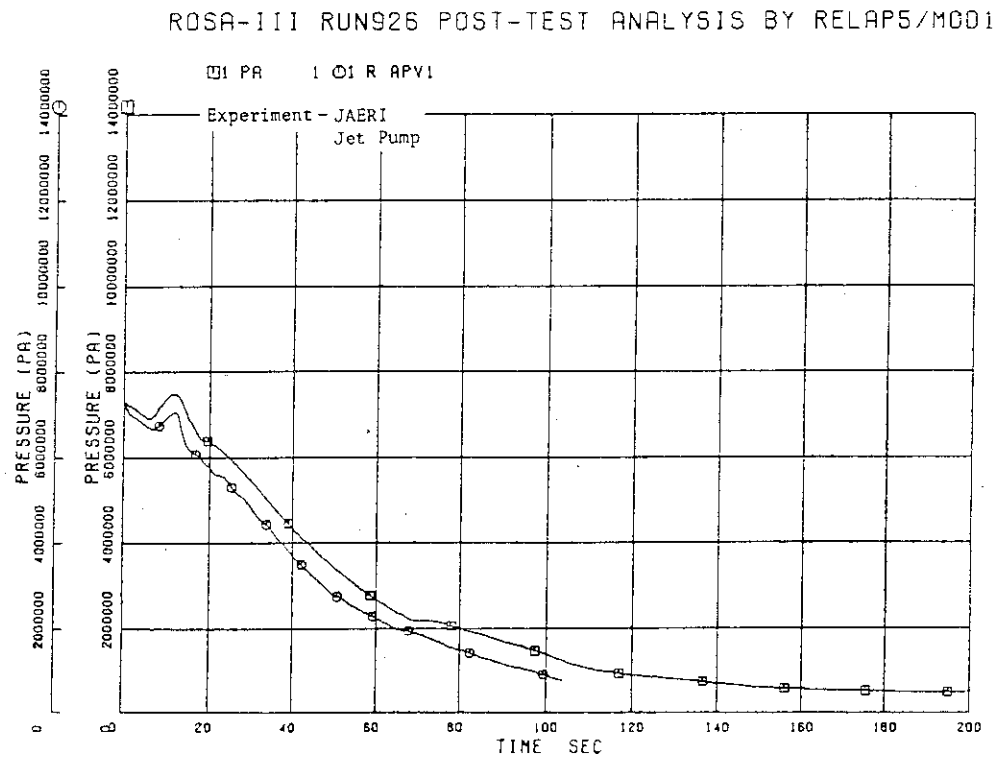

Fig. A1.1　　Lower plenum pressures (RUN926)

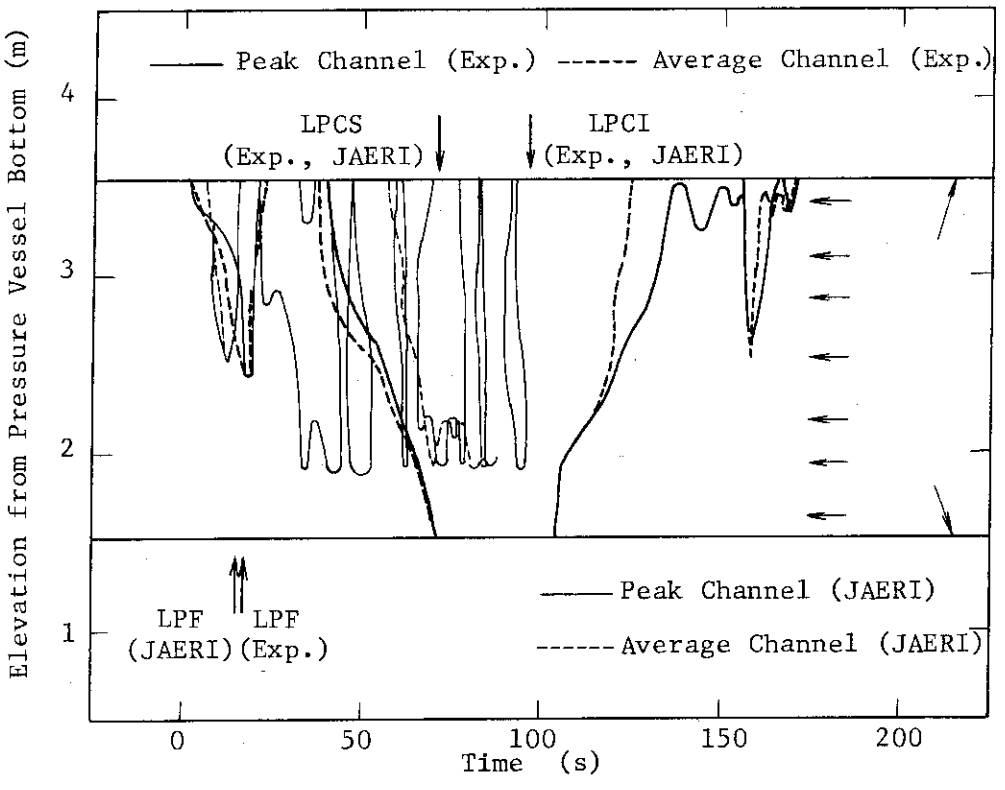

Fig. A1.2　　Mixture levels in core (RUN926)

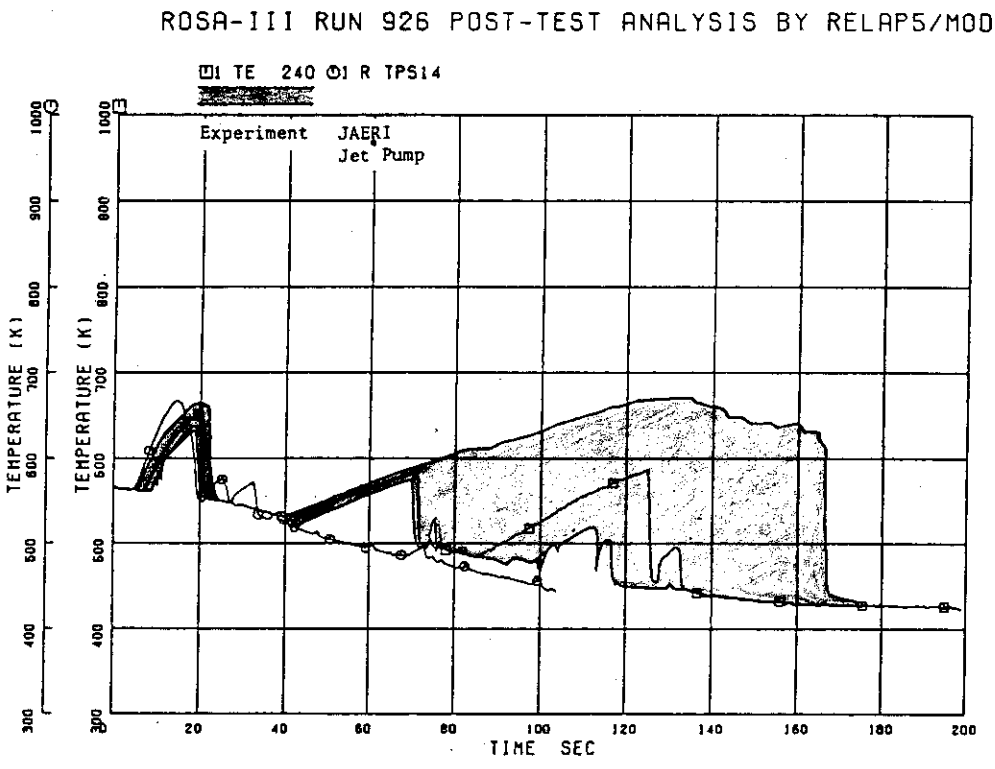

Fig. A1.3(a) Heater rod surface temperatures; Peak power channel, Position 1 (RUN926)

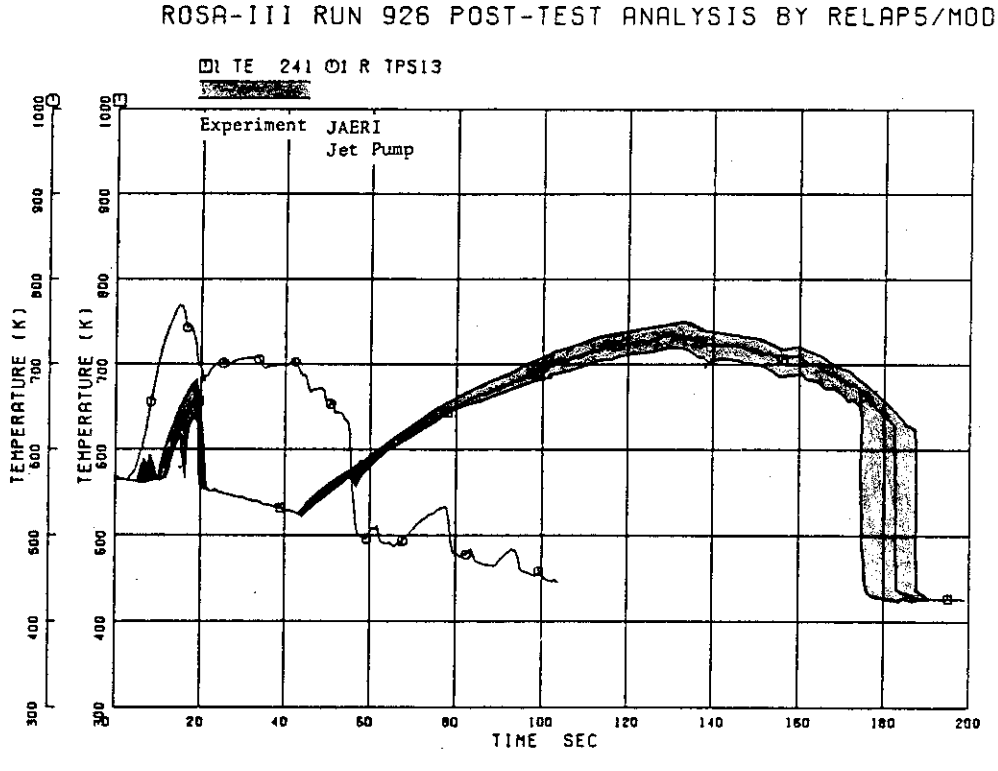

Fig. A1.3(b) Heater rod surface temperatures; Peak power channel, Position 2 (RUN926)

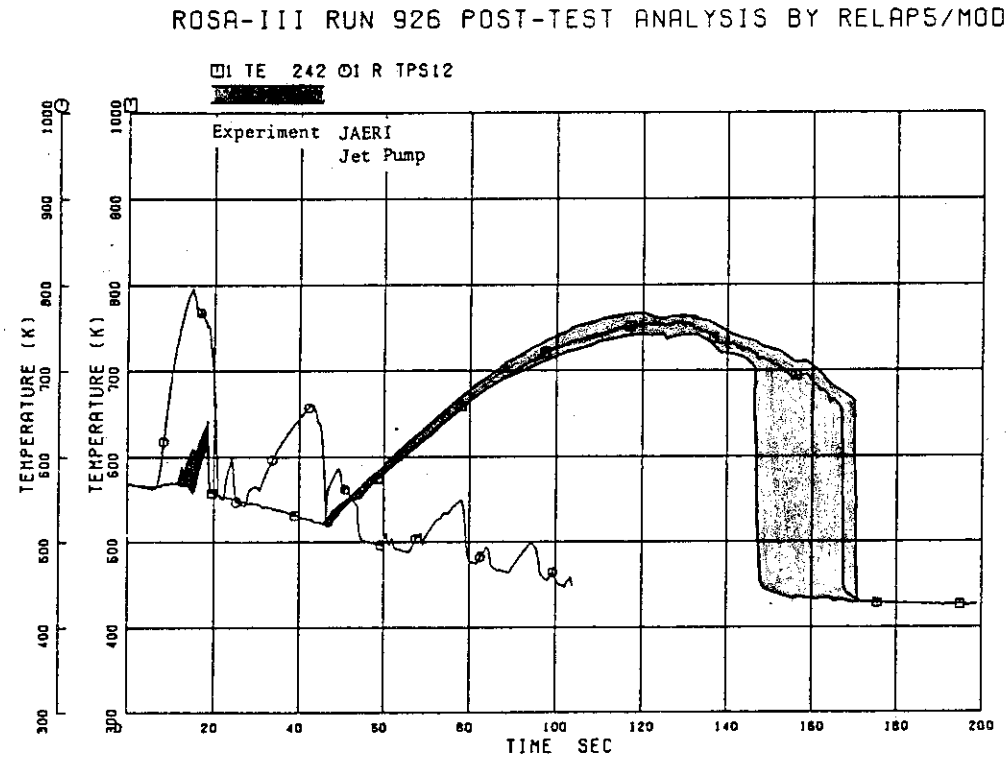

Fig. A1.3(c) Heater rod surface temperatures; Peak power channel, Position 3 (RUN926)

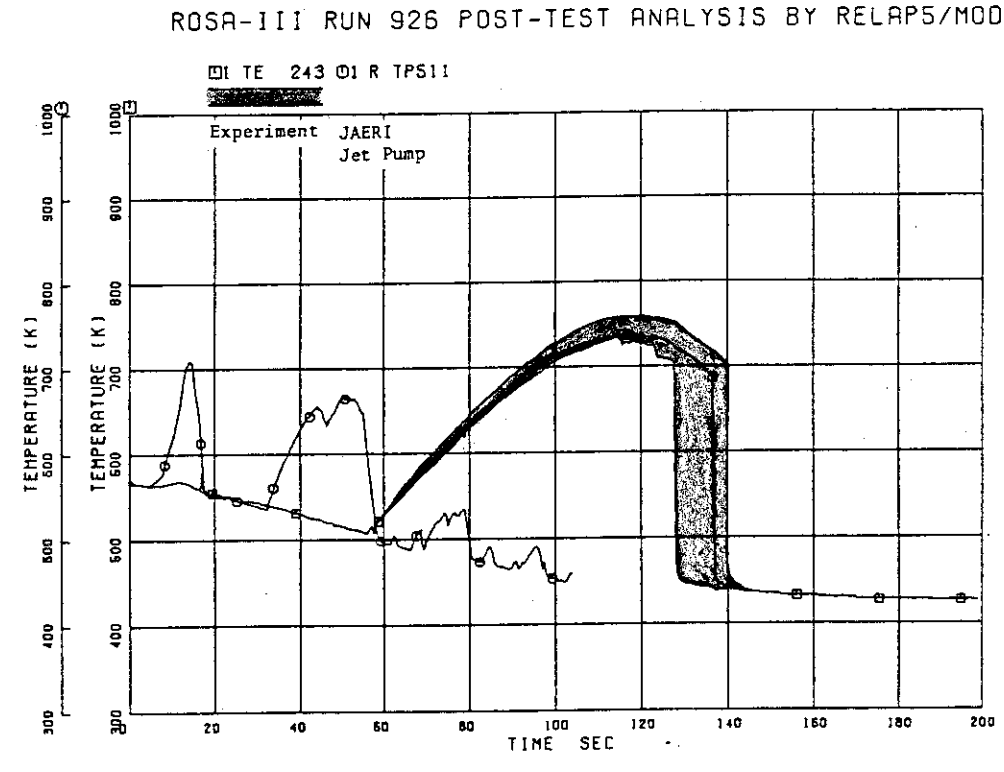

Fig. A1.3(d) Heater rod surface temperatures; Peak power channel, Position 4 (RUN926)

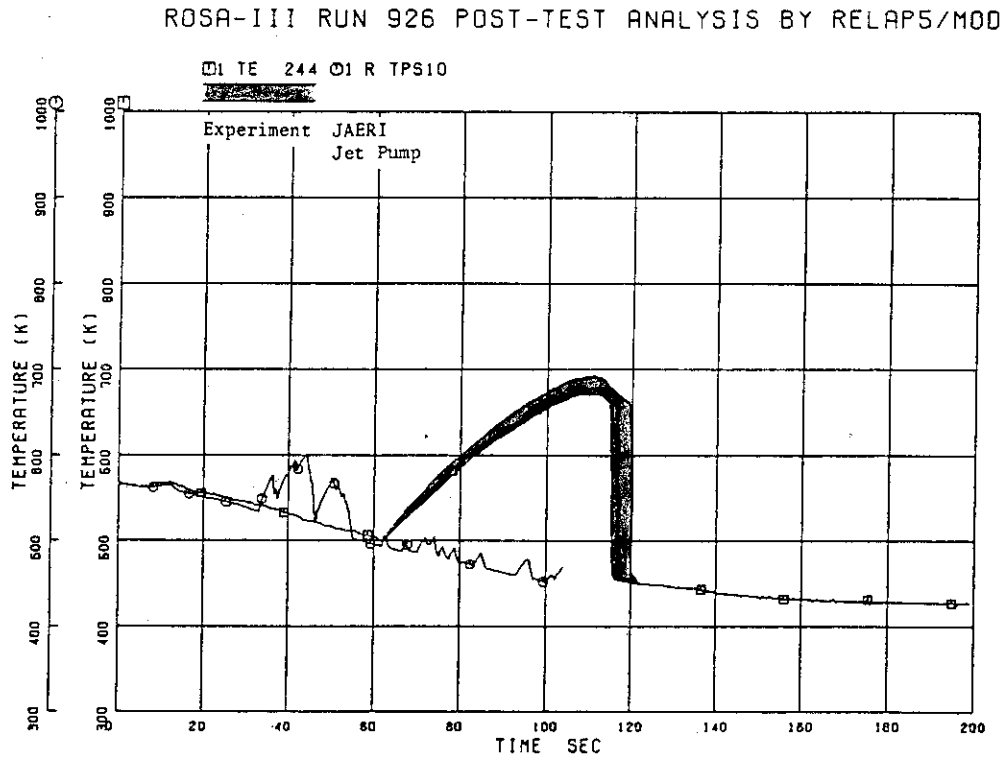

Fig. A1.3(e) Heater rod surface temperatures; Peak power channel, Position 5 (RUN926)

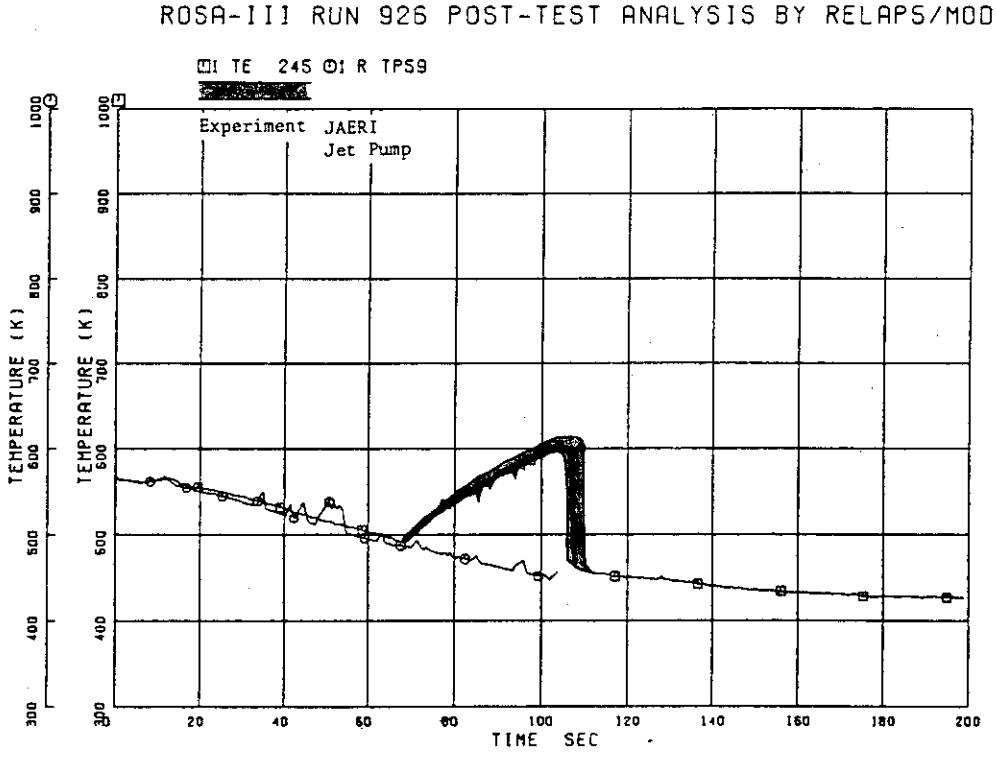

Fig. A1.3(f) Heater rod surface temperatures; Peak power channel, Position 6 (RUN926)

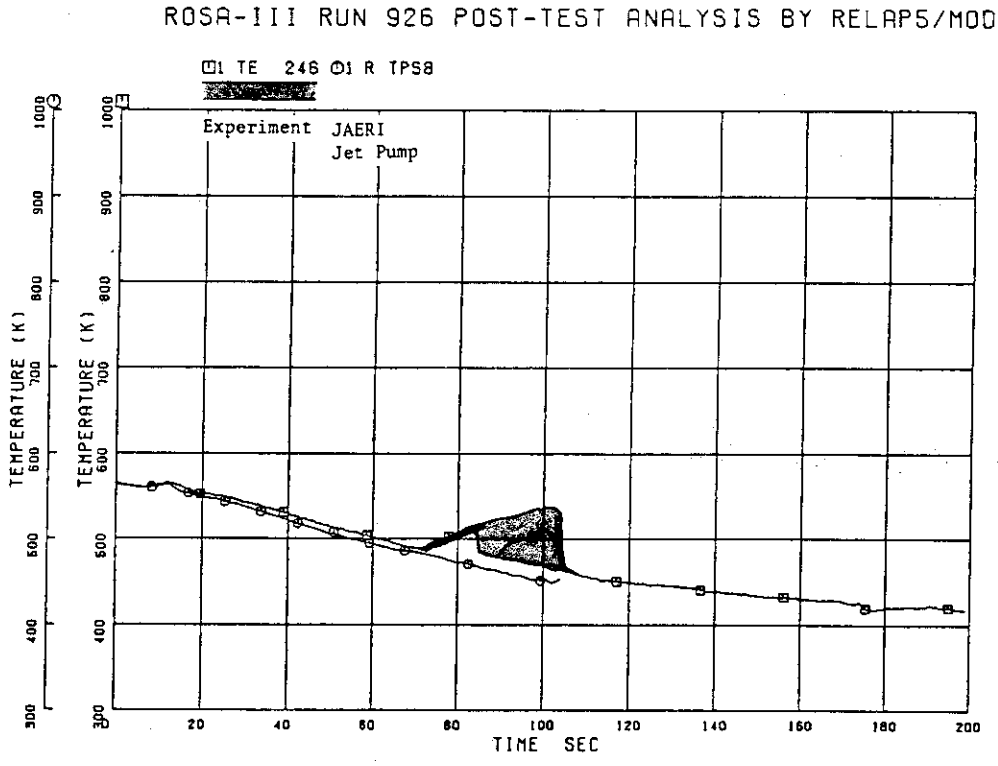

Fig. A1.3(g) Heater rod surface temperatures; Peak power channel, Position 7 (RUN926)

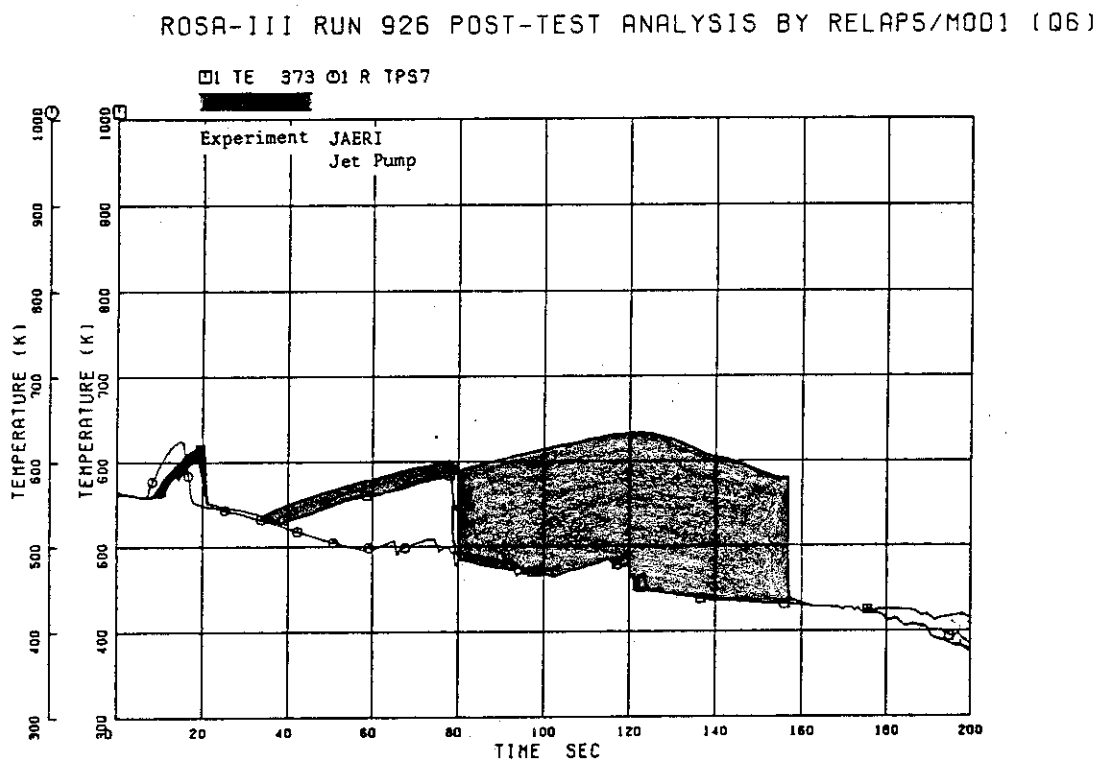

Fig. A1.4(a) Heater rod surface temperatures; Average power channel, Position 1 (RUN926)

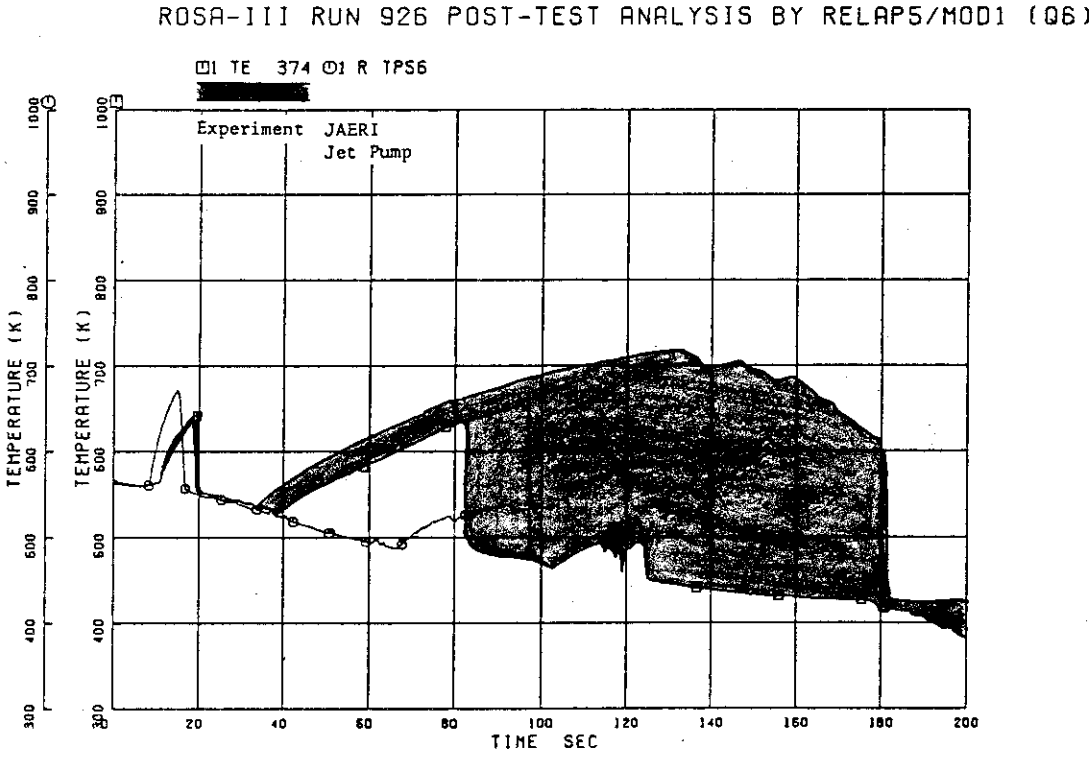

Fig. A1.4(b) Heater rod surface temperatures; Average poerr channel, Position 2 (RUN926)

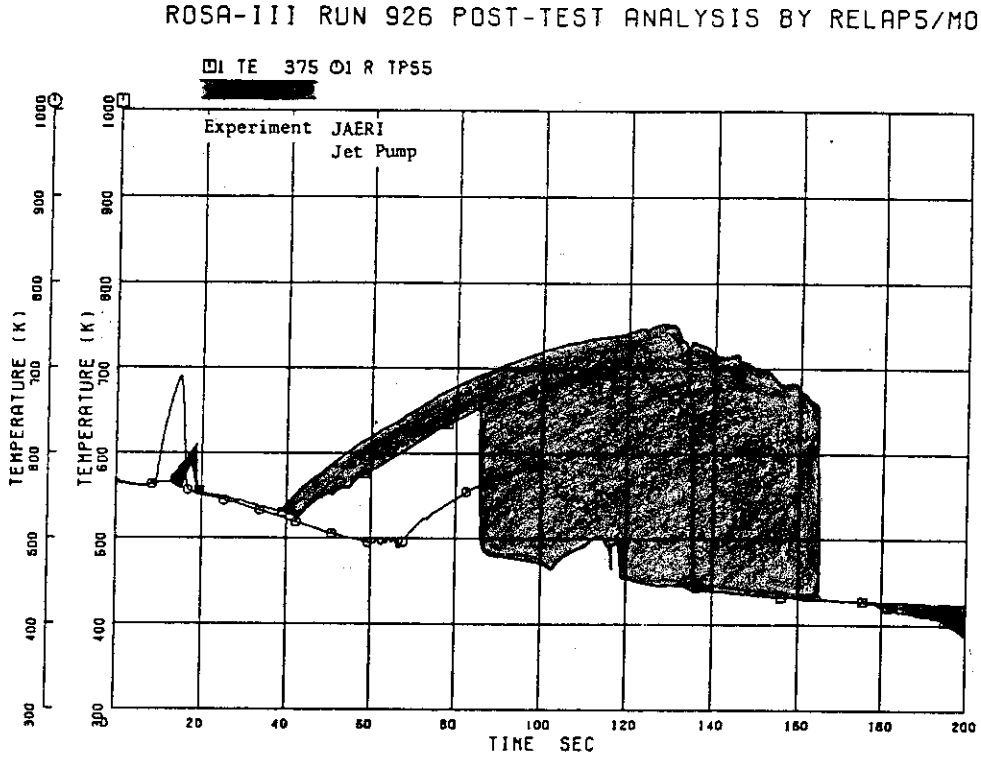

Fig. A1.4(c) Heater rod surface temperatures; Average power channel, Position 3 (RUN926)

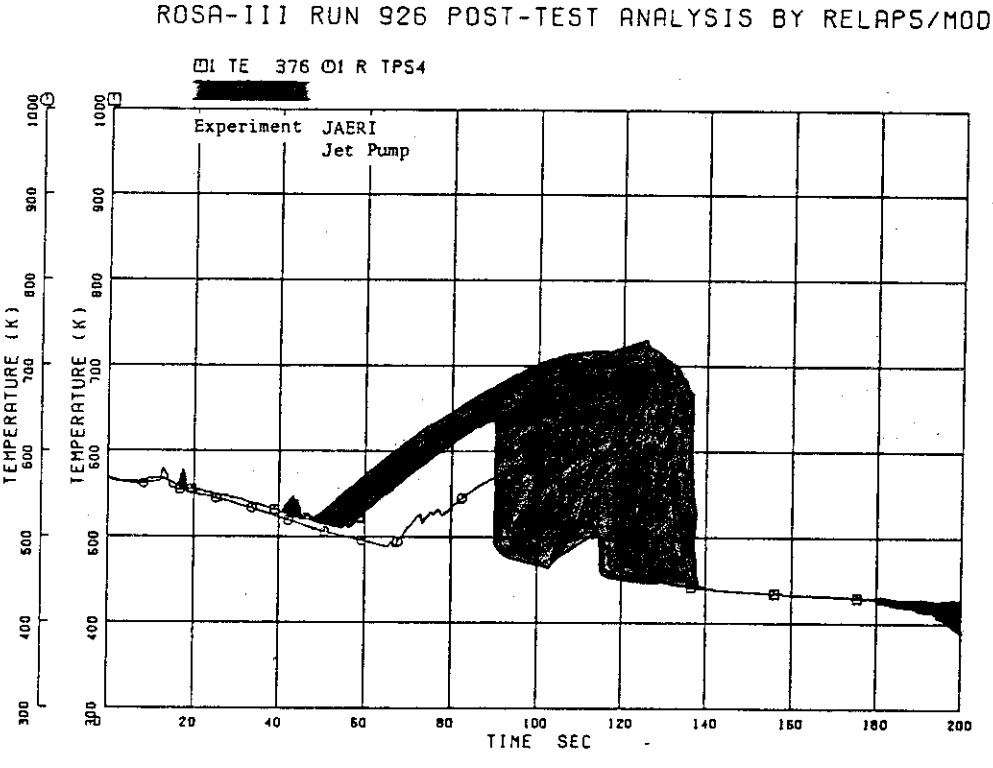

Fig. A1.4(d) Heater rod surface temperatures; Average power channel, Position 4 (RUN926)

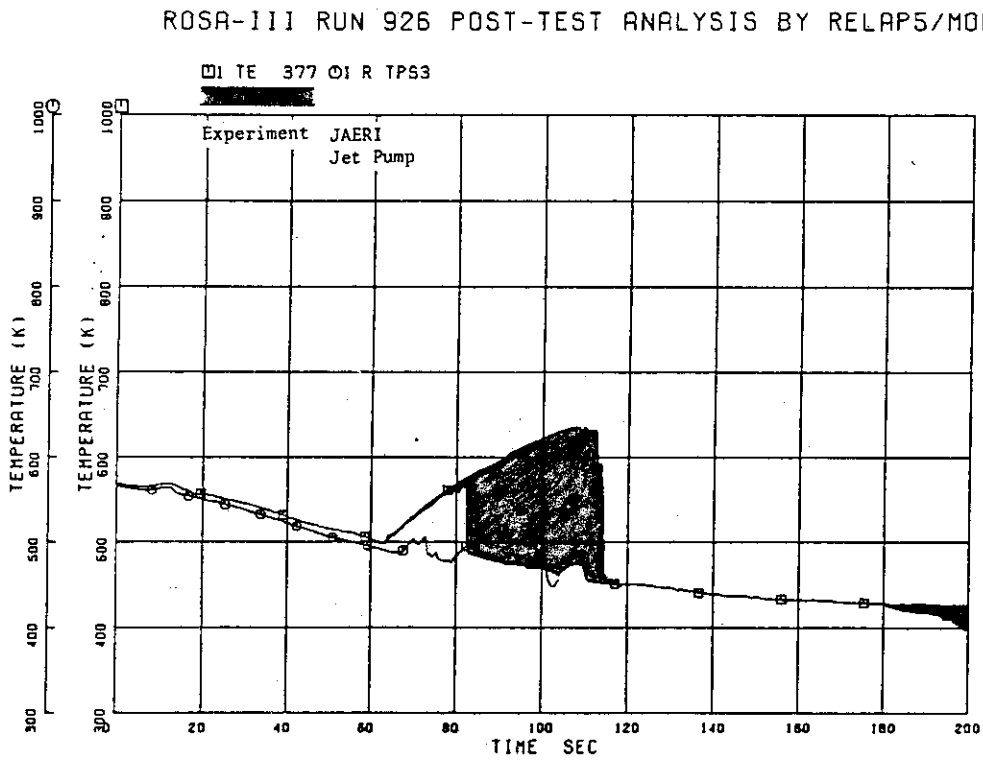

Fig. A1.4(e) Heater rod surface temperatures; Average power channel, Position 5 (RUN926)

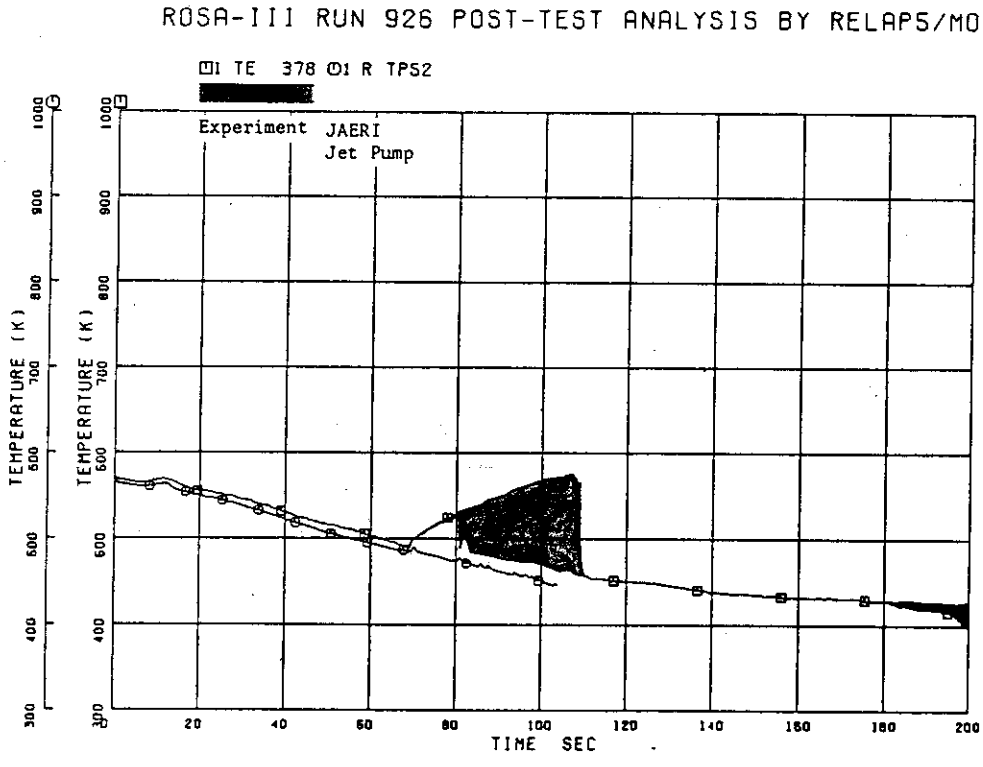

Fig. A1.4(f) Heater rod surface temperatures; Average power channel, Position 6 (RUN926)

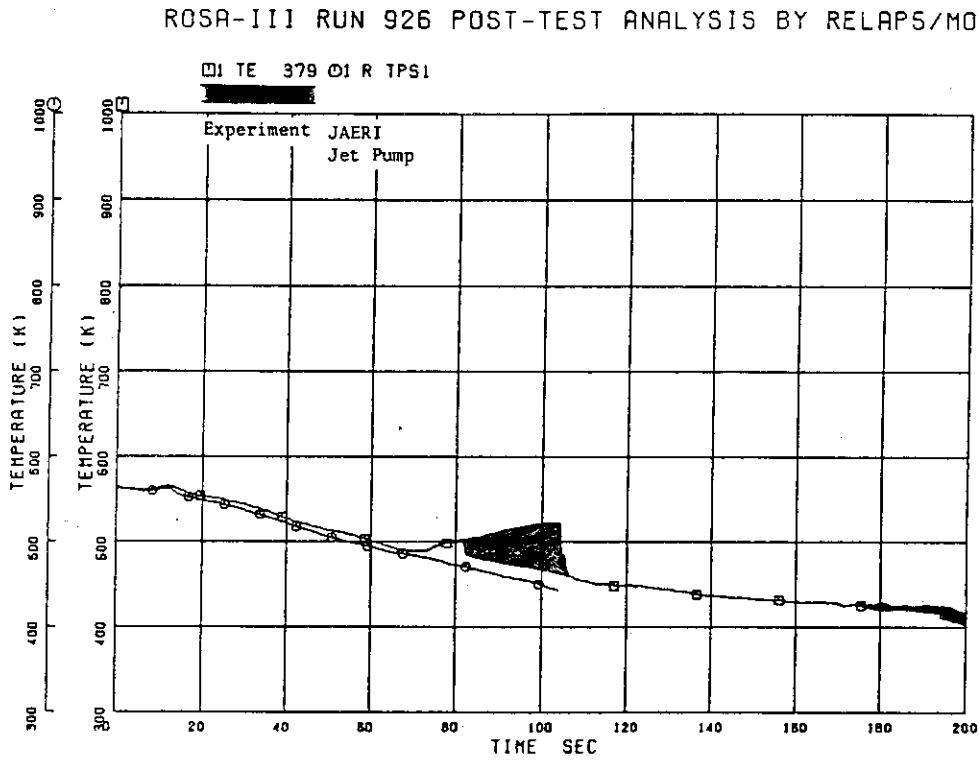

Fig. A1.4(g) Heater rod surface temperatures; Average power channel, Position 7 (RUN926)

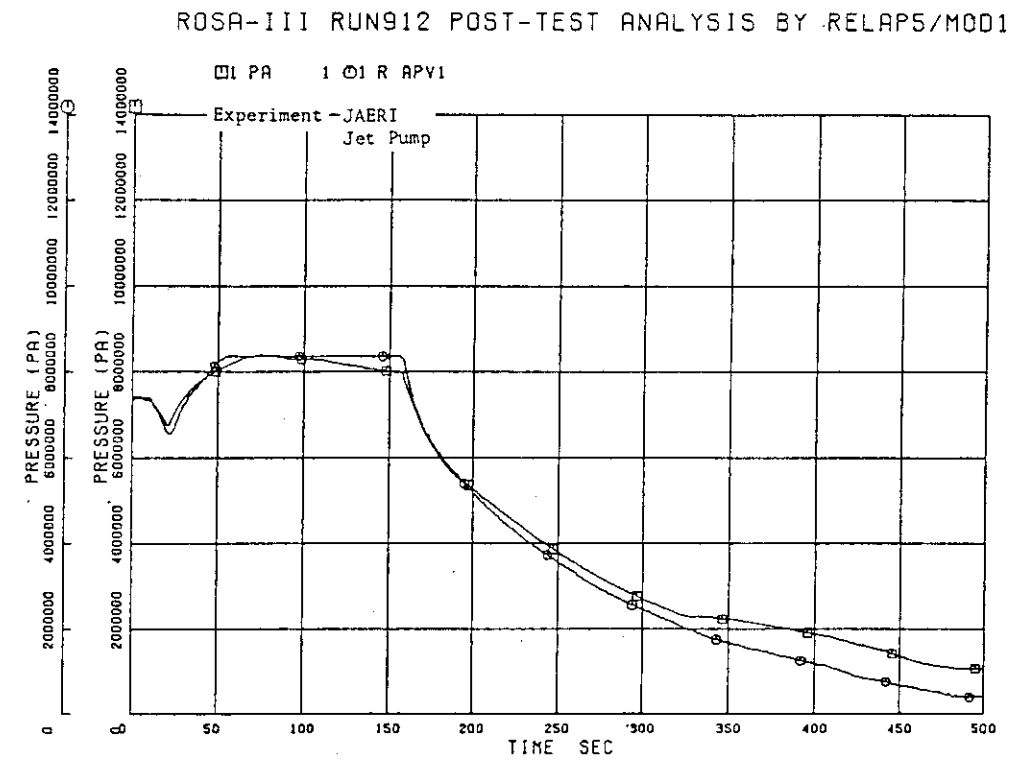

Fig. A1.5　　Lower plenum pressures (RUN912)

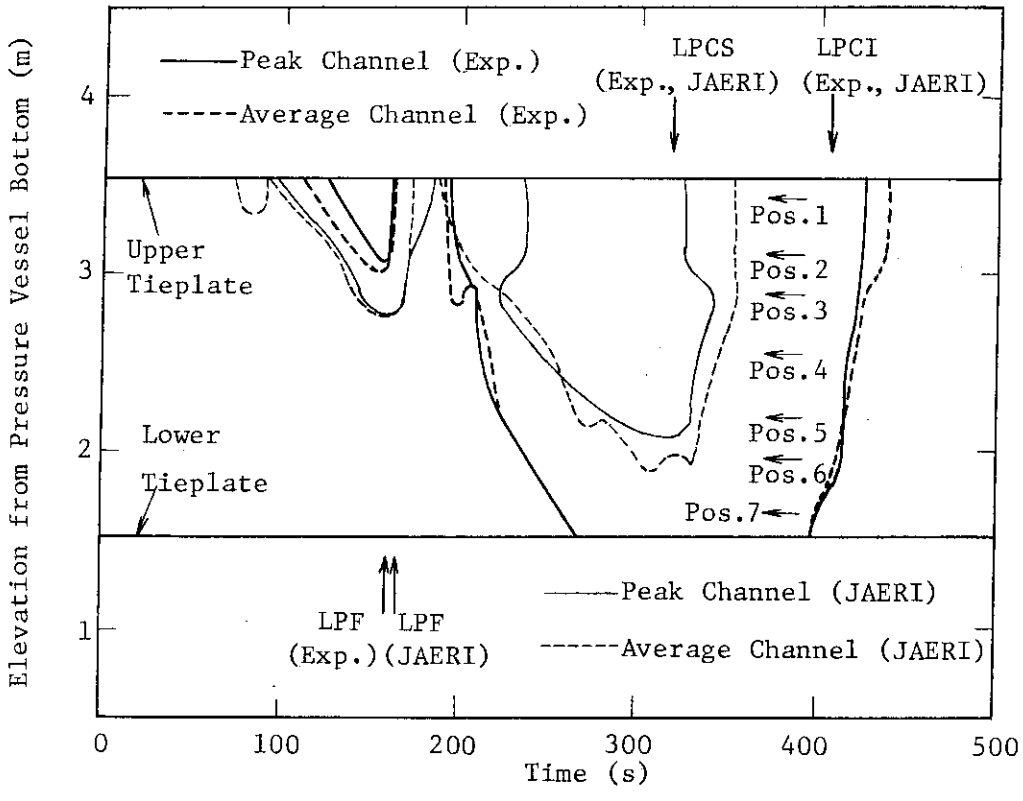

Fig. A1.6　　Mixture levels in core (RUN912)

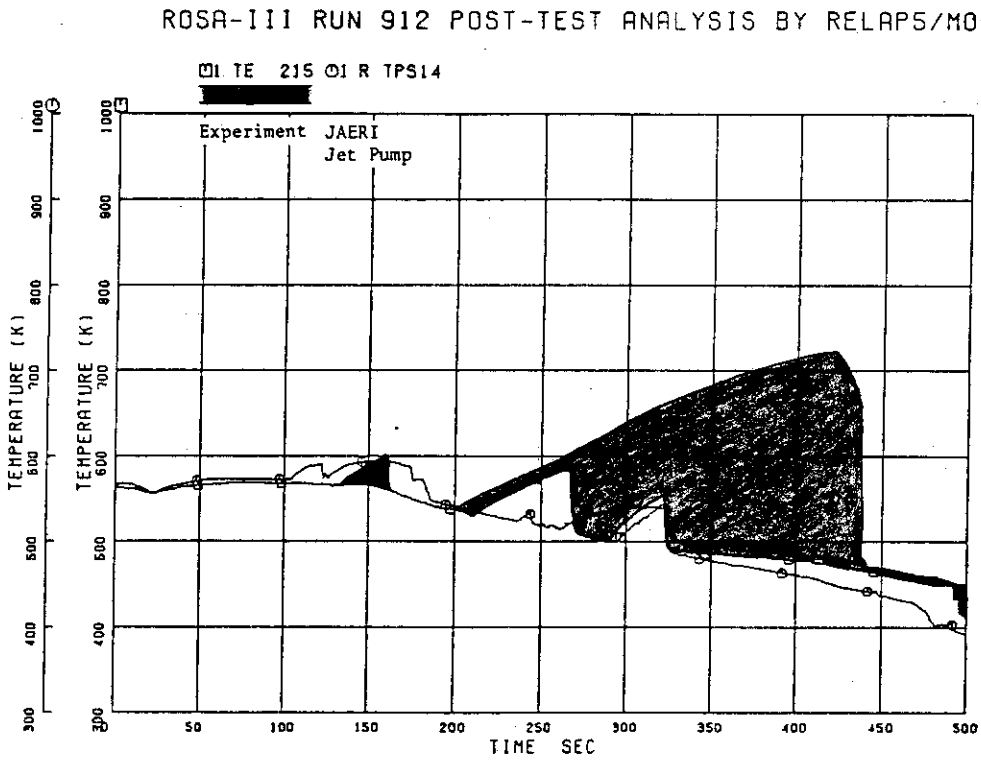

Fig. A1.7(a) Heater rod surface temperatures; Peak power channel, Position 1 (RUN912)

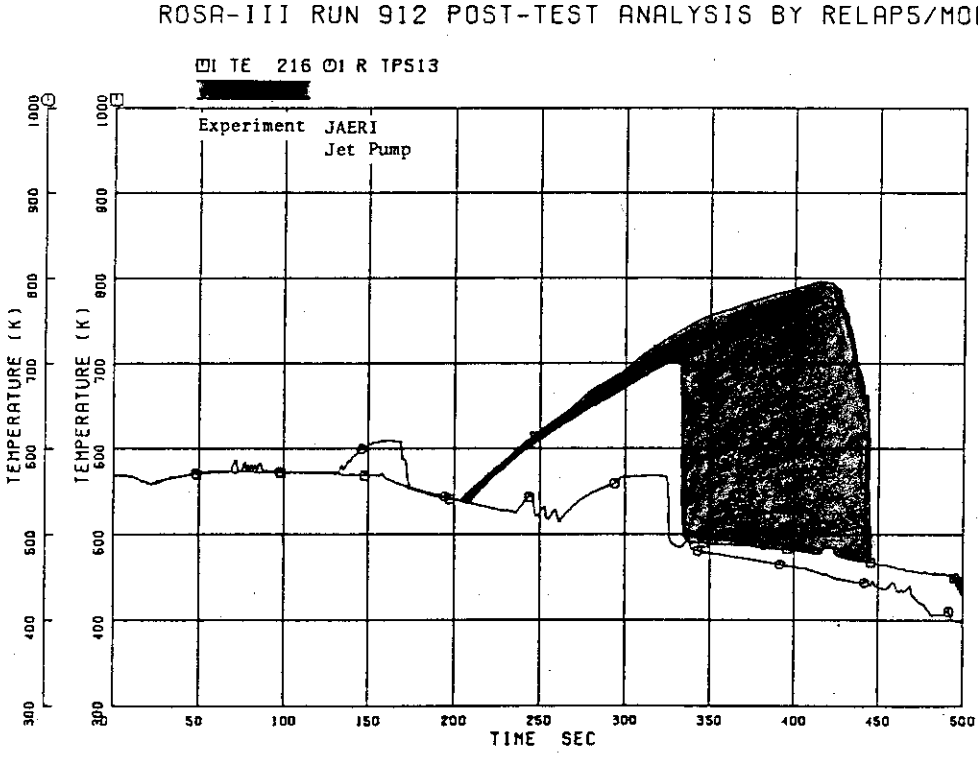

Fig. A1.7(b) Heater rod surface temperatures; Peak power channel, Position 2 (RUN912)

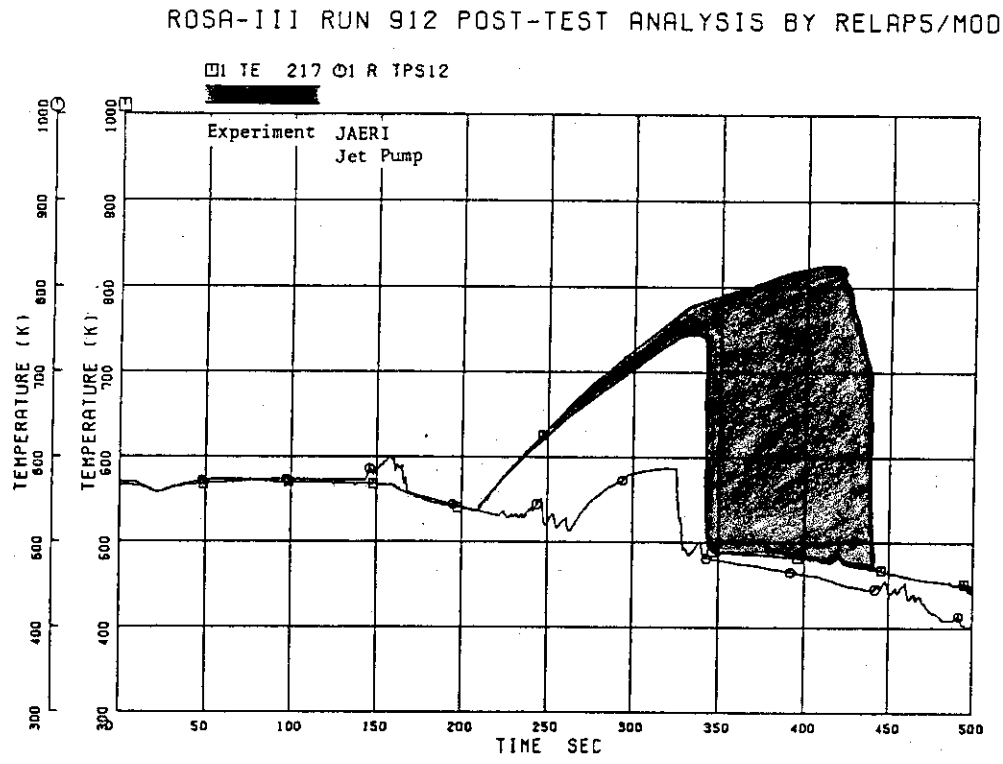

Fig. A1.7(c) Heater rod surface temperatures; Peak power channel, Position 3 (RUN912)

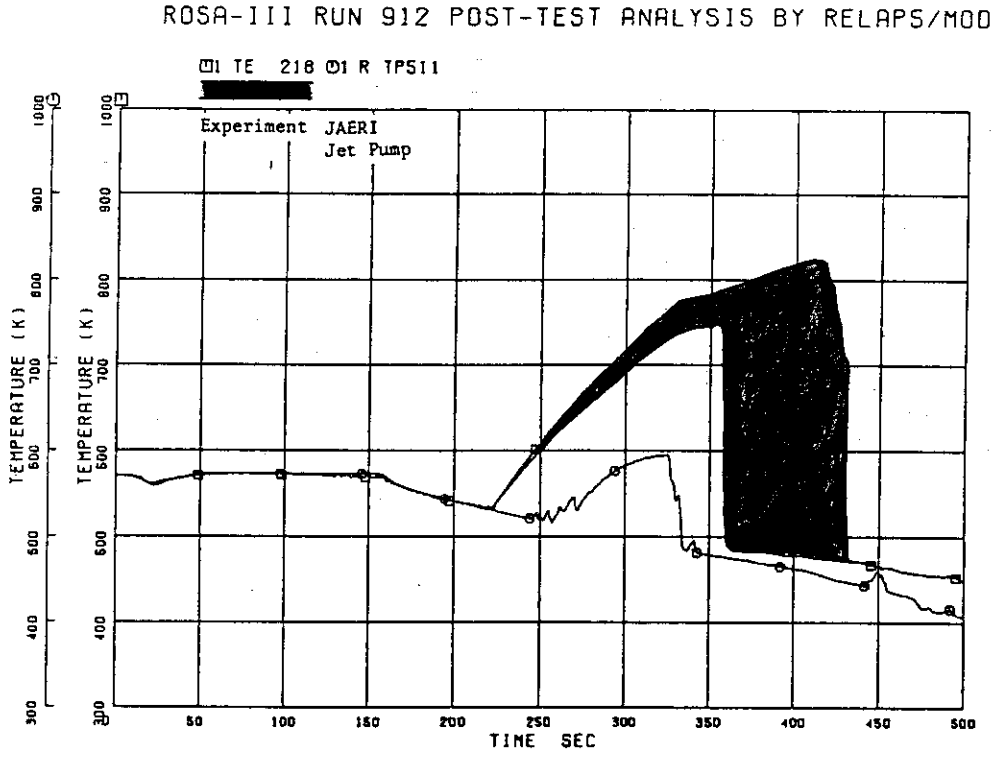

Fig. A1.7(d) Heater rod surface temperatures; Peak power channel, Position 4 (RUN912)

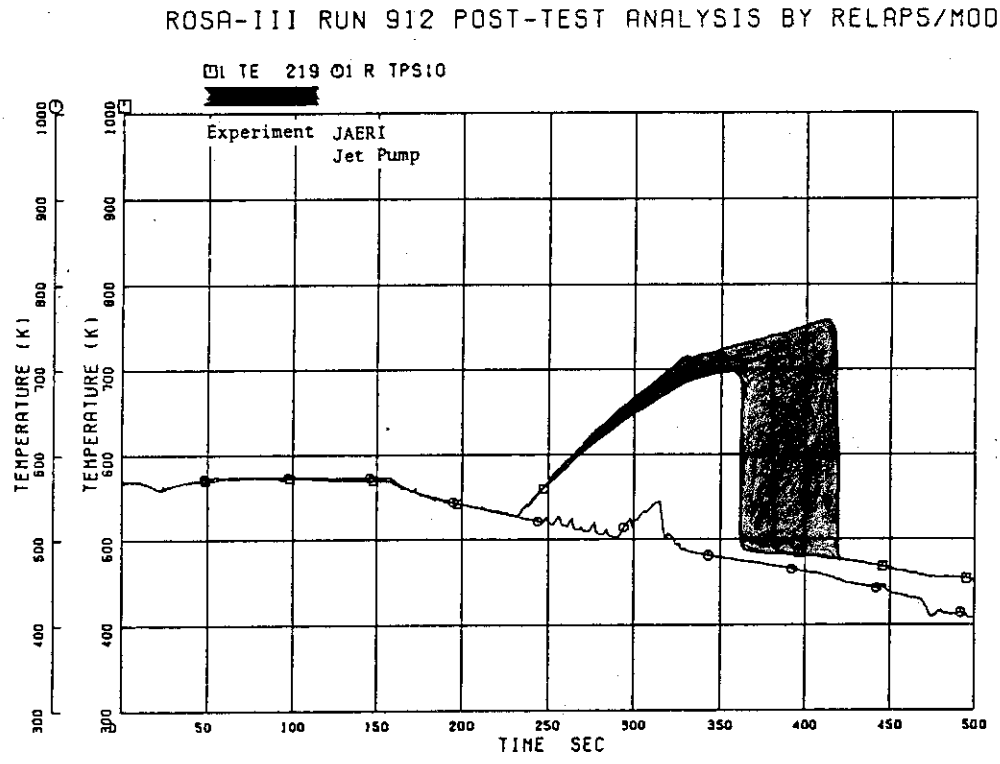

Fig. A1.7(e) Heater rod surface temperatures; Peak power channel, Position 5 (RUN912)

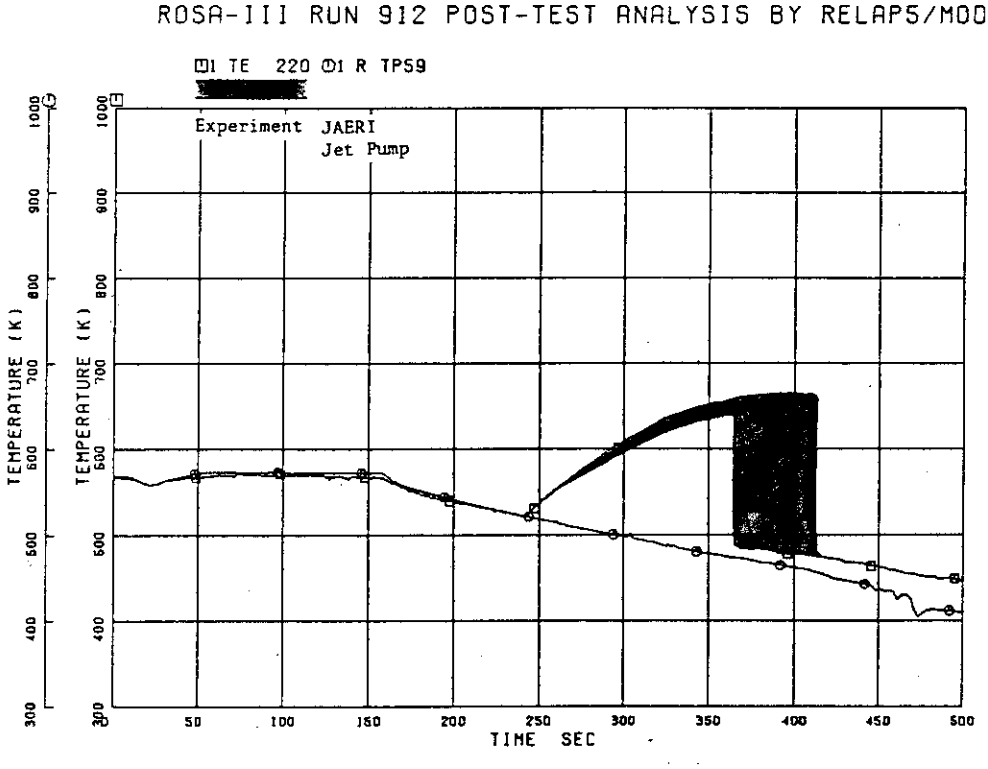

Fig. A1.7(f) Heater rod surface temperatures; Peak power channel, Position 6 (RUN912)

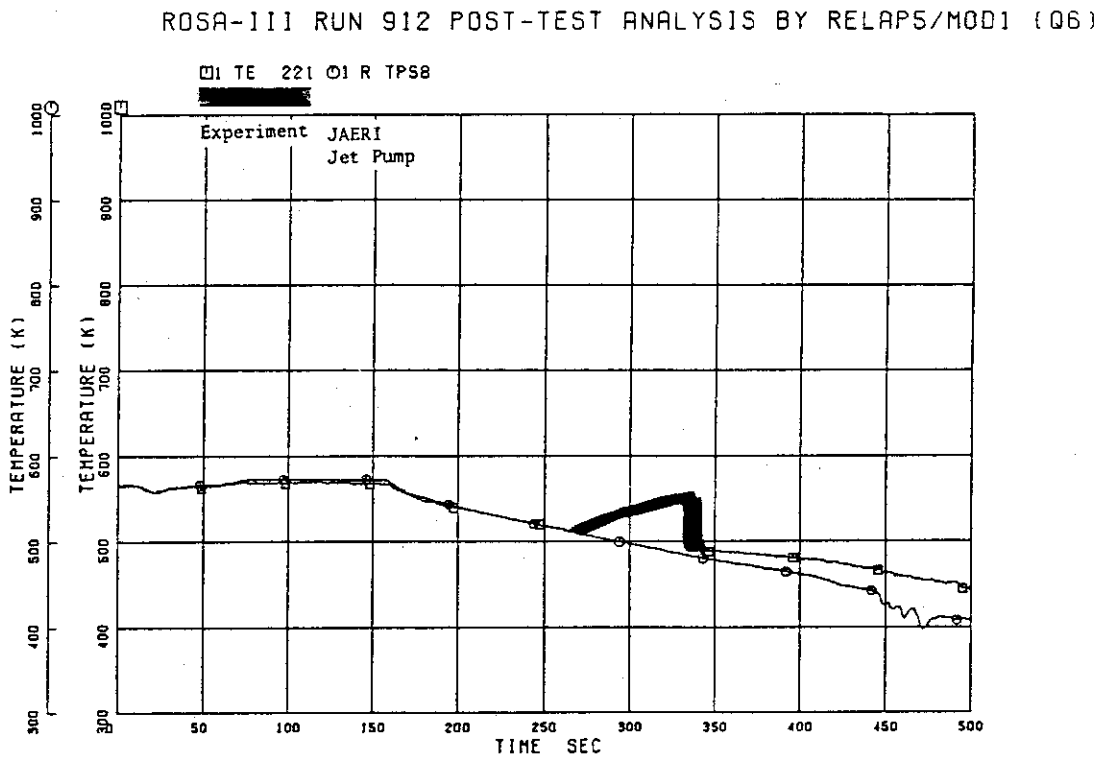

Fig. A1.7(g) Heater rod surface temperatures; Peak power channel, Position 7 (RUN912)

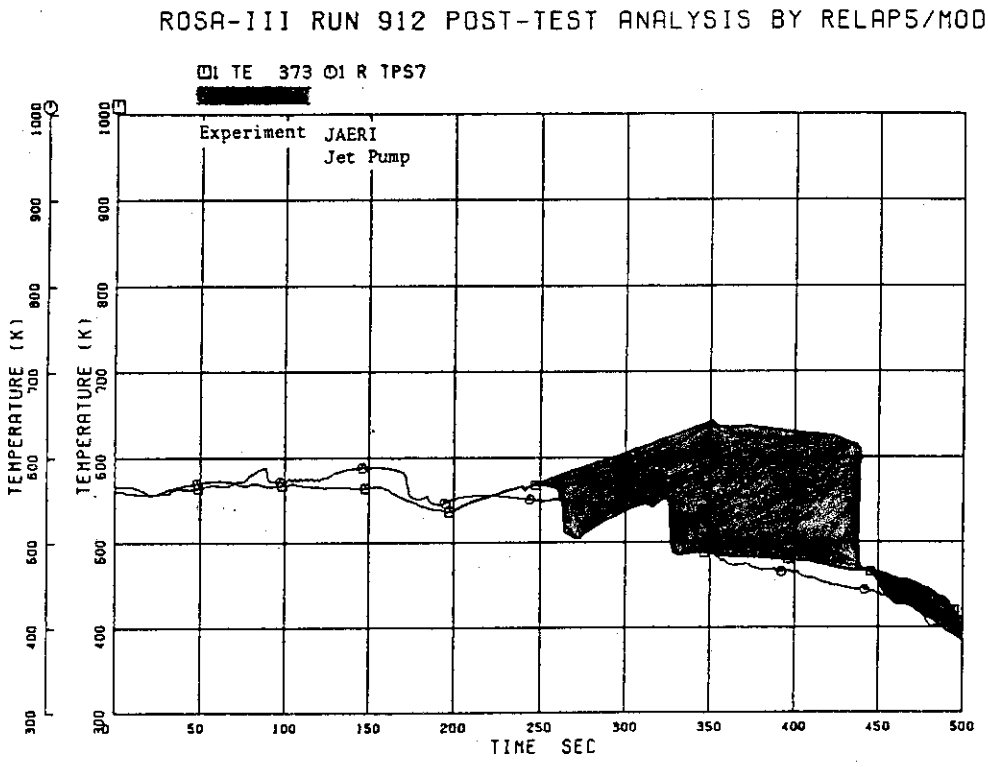

Fig. A1.8(a) Heater rod surface temperatures; Average power channel Position 1 (RUN912)

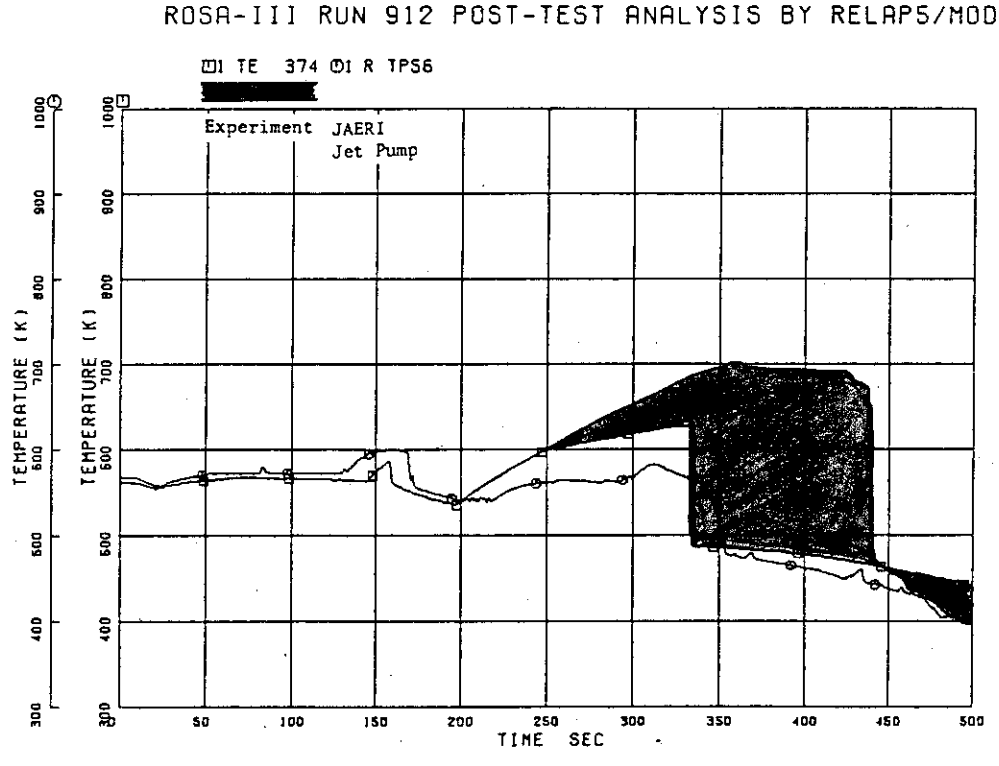

Fig. A1.8(b) Heater rod surface temperatures; Average power channel, Position 2 (RUN912)

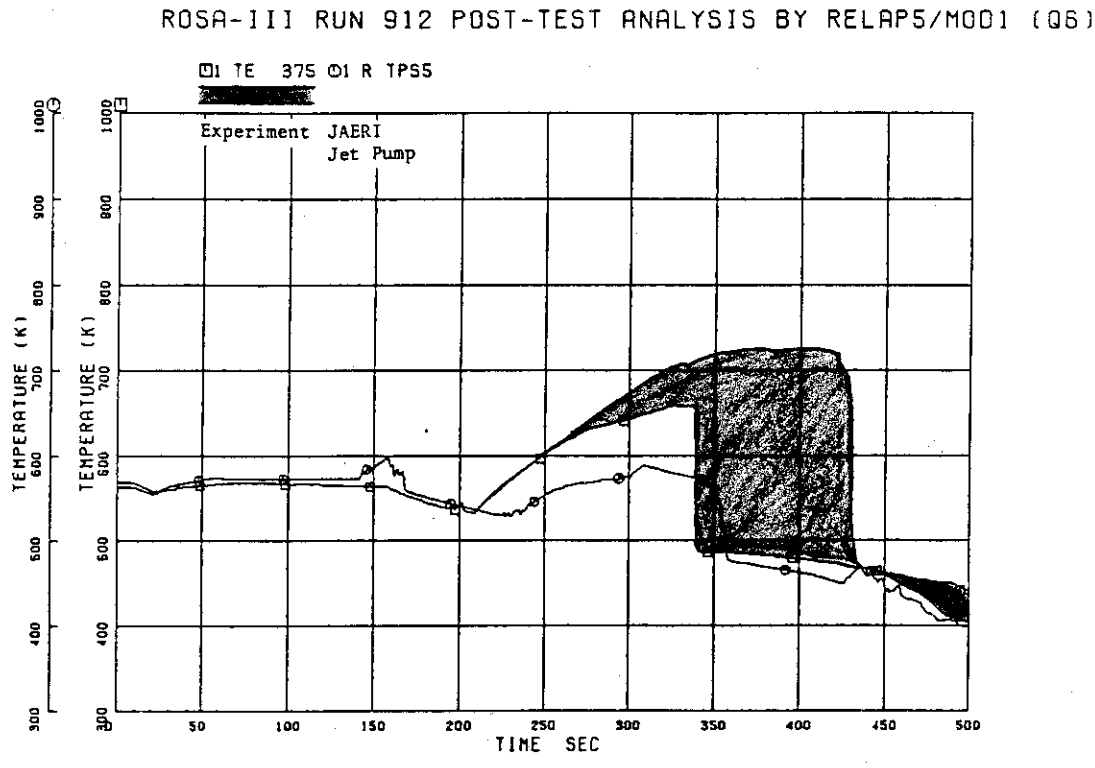

Fig. A1.8(c) Heater rod surface temperatures; Average power channel, Position 3 (RUN912)

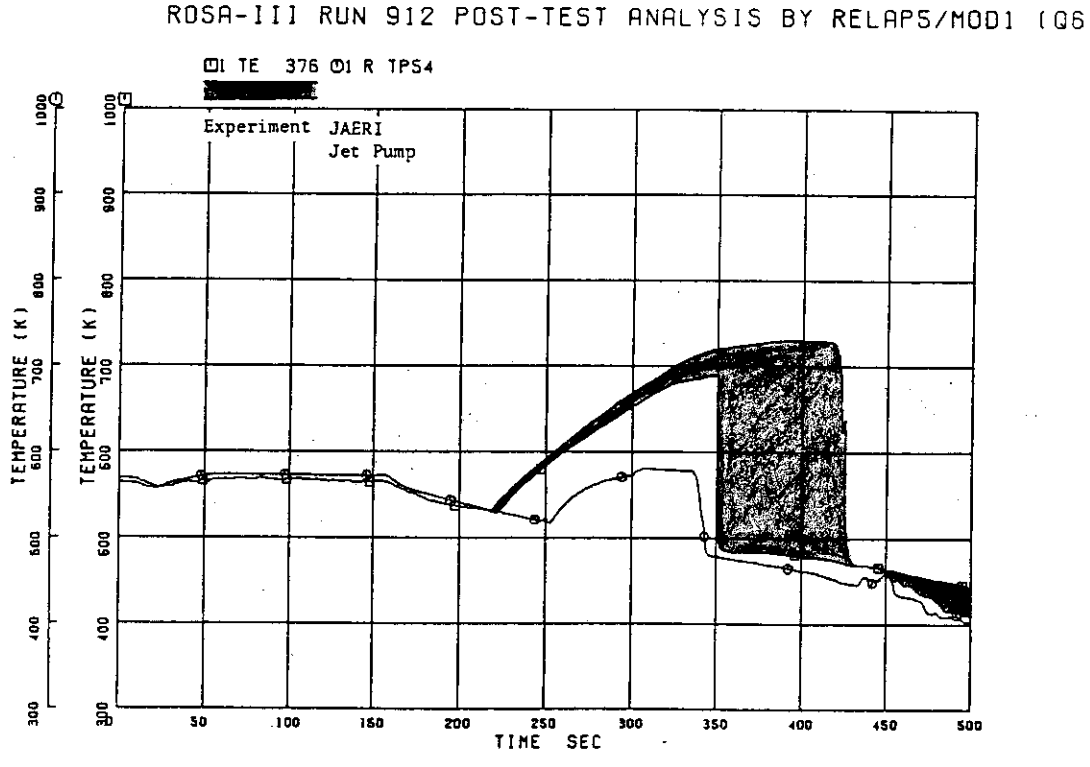

Fig. A1.8(d) Heater rod surface temperatures; Average power channel, Position 4 (RUN912)

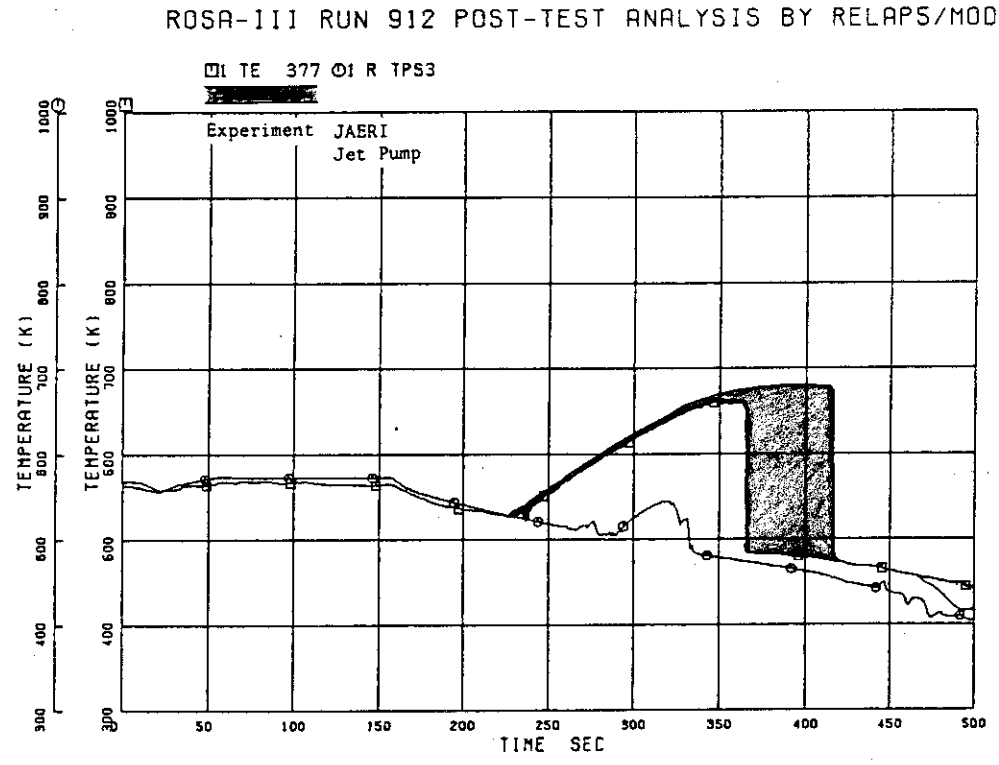

Fig. A1.8(e) Heater rod surface temperatures; Average power channel, Position 5 (RUN912)

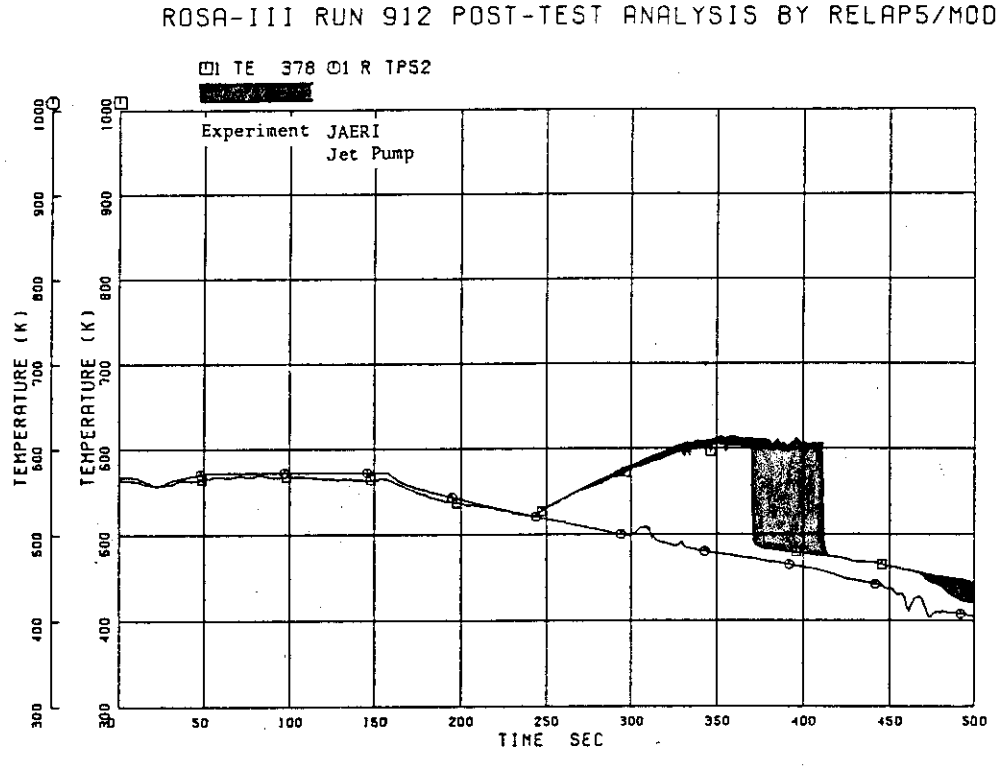

Fig. A1.8(f) Heater rod surface temperatures; Average power channel, Position 6 (RUN912)

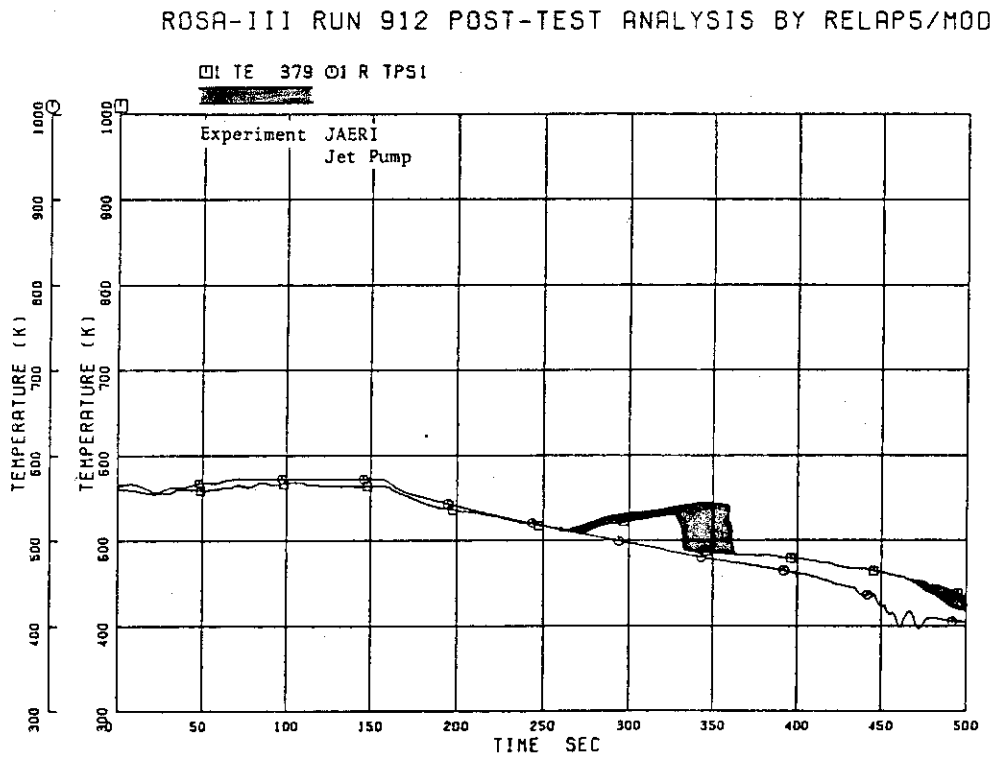

Fig. A1.8(g) Heater rod surface temperatures; Average power channel, Position 7 (RUN912)

付録 2.A　原研ジェットポンプモデルの改良点

改良および機能拡張を行った5点は以下の通りである。

(1) 複数個のジェットポンプ入力

(2) 解の安定化

(3) 吐出流量計算の修正

(4) リスタート機能の改良

(5) プロッター機能の改良

これらについての説明を以下に示す。

(1) 複数個のジェットポンプ入力

ジェットポンプ・コンポーネント"JETPUMP"において，最大4種類のジェットポンプを扱えるようにし，新たにCOMMON／JPDATA／を設け，サブルーチンJETPで必要となるデータを確保した。なお，1種類のジェットポンプ・コンポーネントで，複数のジェットポンプを代表させることができる。例えば，BWRの1ループ当り12基のジェットポンプを1つのジェットポンプ・コンポーネントで代表させる場合には，各部流路径（d_i），長さ（ℓ_i）および摩擦係数（λ_i）に1基当りの値を入力し，12基分の流れを解くことを入力すればよい。

COMMON／JPDATA／NJP，NOCOM(4)，DIA(7，4)，RLENG(5，4) RAMDA(6，4)，DUMMYY

NJP ……'JETPUMP'コンポーネントのカウンター

NOCOM……コンポーネント番号

DIA ……管の直径データ（D_0～D_6）

RLENG ……管の長さデータ（L_0～L_4）

RAMDA……管摩擦係数（λ_N，λ，λ_I，λ_{DIF}，λ_S，λ_W）

DUMMYY…ダミー

次にこれらのデータの受け渡しを関連したサブルーチン間で可能になるようにした。関連するサブルーチンと改良に伴う変更点をまとめると次のようになる。

サブルーチン名	変更点
GNINIT	……COMMON／JPDATA／の追加， NJP＝0の追加
MAIN	……COMMON／JPDATA／の追加
RBRNCH	……COMMON／JPDATA／の追加， JETPUMPコンポーネント入力を複数個に拡張

VEXPLT ……COMMON／JPDATA／の追加，
（JAERI ジェットポンプ処理ルーチン）
コンポーネント番号によって，該当するデータをCOMMON／JPDATA／から／J PUMP／へコピーする。

更に，2番目のJETPUMPコンポーネントのデータが正しく読み込まれるようにするため，DATA文で1に初期セットしている変数を，サブルーチンINP 2を呼ぶ前に強制的に1にセットした。

RBRNCH ……L 3F(6)，L 3G(6)，L 3F(6)のそれぞれにSub. INP 2 を呼ぶ前に1をセット

(2) 解の安定化

サブルーチンJETPでは吸込側流量（W_s）と駆動側圧力（$P_1 = P_{drive}$）を求めているが，これらが，RELAP 5による解（サブルーチン JETPを呼ぶ前）と，サブルーチン JETPによる解の間で変化が大きすぎると，RELAP 5コードの解の安定性に悪影響を及ぼし，ついには計算が停止してしまうことがある。

そこで1タイムステップ当りの変化量を小さくするように制限を設けた。なお，入力条件によっては解を得る上で判別式（HANB）が負となる場合があるが，この時にはW_sとP_{drive} 共に入力時の値を用い，吐出流量（W_{dis}）は吸込流量と駆動流量の和（$W_s + W_{drive}$）とした。

変化量の制限
吸込側流量　$-DW \times W_{SI} < W_S < DW \times W_{SI}$
駆動側圧力　$-DP \times P_{1I} < P_1 < DP \times P_{1I}$
W_S ：吸込側流量（Sub. JETP での解）
W_{SI} ：〃　（入力値：RELAP 5の解）
DW ：〃　の制限係数
P_1 ：駆動側圧力（Sub. JETP での解）
P_{1I} ：〃　（入力値：RELAP 5 の解）
D_P ：〃　の制限係数

ここで，W_SとP_1が上記制限内の時はサブルーチン JETP の解を使用し，制限を超えた場合は上限値又は下限値を用いる。制限係数は，D_w，D_P 共に 0.2％（0.002）を用いた。サブルーチンと変更点は以下のようになる。

サブルーチン	変更点
VEXPLT	……W_{dis} のRELAP 5への反映
JETP	……変化量の制限

(3) 非定常計算時の吐出流量の改良

原研ジェットポンプモデルは，吸込側コンポーネントで気泡が生じると使用されず，RELAP 5のBRANCHコンポーネントに切り換えられる。一方，吐出側逆流に関するコンポーネントの切り換え判定条件がなかったため，逆流後にも発泡直前のサブルーチンJETPの計算値が毎ステップたされてしまい吐出側流量増大を招いた。そこで駆動流または吸込流逆流時の判定条件を吐出側ジャンクションにも設けた。改良したサブルーチンはVEXPLTである。

(4) リスタート機能の改良について

RELAP 5コードにはリスタート計算の機能があるが，データ領域（COMMON領域も含める）はDynamic Storageを制御することにより実現している。原研ジェットポンプモデルの組込みにあたり，新たにCOMMON／JPDATA／が設けられたので，このCOMMONをDynamic Storageに登録してリスタート機能が可能となるようにした。改良したサブルーチンはGNINITである。

(5) プロッター出力の改良

RELAP 5のFACOM版ではプロッター用ファイルを出力しており，サブルーチンDTSTEPで処理している。原研ジェットポンプモデルを組み込む際，サブルーチンDTSTEPをCDC版において修正されたままの状態になっていたので，ステートメントを追加し，プロッター用ファイルを出力できるようにした。改良したサブルーチンはDTSTEPである。

(6) 以上の改良により原研ジェットポンプモデルを組み込んだRELAP 5／MOD 1／CY 1 コードは実験解析が可能となった。なお，この改良されたサブルーチンをRELAP 5／MOD 1／CY 18にも適用し，同様に使用可能とした。

付録 2.B　ジェットポンプモデル関連プログラムリスト

RELAP 5／MOD 1／CY 1にJAERI ジェットポンプモデルを組込まれた後に改良があったSubroutine に関して，その改良および修正箇所とその内容を実際のプログラムリストに記述したものである。

```
FACOM OSIV/F4 FORTRAN IV (HE)  V04L18            DATE 83.07.06  TIME 13.40.24                                    PAGE    1

SPECIFIED OPTIONS: NONAME,FLAG(I),BYNAME,NOSTMT,NOSTATIS,ISN(6),NOMAP,ELM(*)

                *DECK DTSTEP
  ISN 00001             SUBROUTINE DTSTEP                                                              ########
                *CALL DECLARE                                                                          ########
                C.....................................RELAP5/MOD1 IS IMPLEMENTED ON A FACOM M-200 COMPUTERS#
  ISN 00002             IMPLICIT REAL*8(A-H,O-Z)                                                          AT  #
                C.....................................DECLARE FUNCTION(FOR PACKWORD) TYPE.....  JAPAN#
  ISN 00003             REAL*8   OAND,OOR,ONOT,SHIFT,OMASK,XOR,OADD,OBIT,SHIFTO,SHIFTI             ATOMIC#
  ISN 00004             INTEGER  IMTD,IOANO,ISHIFT,IDIB                                            ENERGY#
  ISN 00005             LOGICAL  LLT,LLE,LEQ,LNE,LGT,LGE                                          RESEARCH
                C.....................................................................INSTITUTE
                *CEND                                                                               DEVL END
                *CALL COMCTL
                C
  ISN 00006             COMMON /COMCTL/ COMOAT(30),FILID(30),FILSIZ(30),FILNOX(30),SAFE1
  ISN 00007             REAL*8          COMOAT                                                    PACKWORD
  ISN 00008             INTEGER FILSIZ,FILNOX
  ISN 00009             LOGICAL NEWRST
  ISN 00010             EQUIVALENCE (SAFE1,NEWRST)
                *CEND                                                                               DEVL END
                *CALL CONTRL
                C
  ISN 00011             COMMON /CONTRL/ DTHY,DTHT,DTN,DT,PRINT,TIMEHY,TIMEHT,ERRMAX,
                       * TMASS,TMASSO,EMASS,EMASSO,AFLAG,SUCCES,DONE,NCOUNT,NSTSP,NREPET,
                       * HELP,CPUREM(2),SAFE2
                C####  INTEGER PRINT,DONE,HELP,SUCCES                                               ########
  ISN 00012             INTEGER        DONE,HELP,SUCCES                                           INTEGER
  ISN 00013             REAL*8  PRINT                                                             PACKWORD
  ISN 00014             LOGICAL AFLAG,RENOD
  ISN 00015             EQUIVALENCE (SAFE2,RENOD)
                *CEND                                                                               DEVL END
                *CALL FAST
                C                                                                                   LCM VERS
  ISN 00016             COMMON /FAST/ FA(100)                                                      ION;DEFI
  ISN 00017             INTEGER IA(2,100)                                                          NE SCOPE
  ISN 00018             EQUIVALENCE (FA(1),IA(1))                                                  O#######
  ISN 00019             REAL*8 LFA(100)                                                            #REAL*8#
  ISN 00020             INTEGER LIA(2,100)
  ISN 00021             EQUIVALENCE (LFA(1),LIA(1),FA(1))
                *CEND                                                                               DEVL END
                *CALL GENRL
                C
                C####  COMMON /GENRL/ CTITLE(10),FAIL,IROUTE,NCASE,PTITLE(7),                      ########
  ISN 00022             COMMON /GENRL/ CTITLE(12),FAIL,IROUTE,NCASE,PTITLE(9),                     CHARACTR
                       * UNITI,UNITO,SAFE3
                C####  INTEGER CTITLE,PTITLE                                                       ########
  ISN 00023             REAL*8  CTITLE,PTITLE                                                     CHARACTR
  ISN 00024             REAL*8                          IROUTE                                    PACKWORD
  ISN 00025             LOGICAL FAIL,UNITI,UNITO
                *CEND                                                                               DEVL END
                *CALL JUNDAT
                C
                C  JUNCTION BLOCK
  ISN 00026             REAL*8AJUN(1),FIJ(1),FORMFJ(1),FORMGJ(1),FIJO(1),                          #REAL*8#
                       * RHOFJ(1),RHOGJ(1),UFJ(1),UGJ(1),VELFJ(1),
                       * VELGJ (1), VELJ  (1), VELFJO(1), VELGJO(1), VELJO (1), VOIOFJ(1),
                       * VOIOGJ(1), FJUNF (1), FJUNR (1), DIAMJ (1), ATHROT(1), VOIDO (1),
```

```
FACOM OSIV/F4 FORTRAN IV (HE)  V04L18     DTSTEP  DATE 83.07.06  TIME 13.40.24                            PAGE    2

                       *  VOIOT(1),ARAT(2),FAAJ(1),MFLOWJ(1),CCAJ(1)
                C####  INTEGER NJUNS(1),NJSKP(1),IJ1(1),IJ2(1),IMREG(1),JC(2),JUNNO(1),          ########
                C#####* JUNFTL(1)                                                                  ########
  ISN 00027             INTEGER NJUNS(2,1)                                                        INTEGER
  ISN 00028             INTEGER          NJSKP(2,1),                                 JUNNO(2,1)INTEGER
  ISN 00029             REAL*8                    IJ1(1),IJ2(1),IMREG(1),JC(2),                   PACKWORD
                       * JUNFTL(1)                                                                  PACKWORD
                C
  ISN 00030              EQUIVALENCE    ( NJUNS (1),FA( 1) )                                      ###IA-FA#
  ISN 00031              EQUIVALENCE    ( NJSKP (1),FA( 2) )                                      ###IA-FA#
  ISN 00032              EQUIVALENCE    ( IJ1   (1),FA( 3) )                                      ###IA-FA#
  ISN 00033              EQUIVALENCE    ( IJ2   (1),FA( 4) )                                      ###IA-FA#
  ISN 00034              EQUIVALENCE    ( AJUN  (1),FA( 5) )
  ISN 00035              EQUIVALENCE    ( FIJ   (1),FA( 6) )
  ISN 00036              EQUIVALENCE    ( FJUNF (1),FA( 7) )
  ISN 00037              EQUIVALENCE    ( FJUNR (1),FA( 8) )
  ISN 00038              EQUIVALENCE    ( FORMFJ(1),FA( 9) )
  ISN 00039              EQUIVALENCE    ( FORMGJ(1),FA(10) )
  ISN 00040             EQUIVALENCE (IMREG(1),FA(11))                                              ###IA-FA#
  ISN 00041             EQUIVALENCE (FIJO(1),FA(12))
  ISN 00042              EQUIVALENCE    ( RHOFJ (1),FA(13) )
  ISN 00043              EQUIVALENCE    ( RHOGJ (1),FA(14) )
  ISN 00044              EQUIVALENCE    ( UFJ   (1),FA(15) )
  ISN 00045              EQUIVALENCE    ( UGJ   (1),FA(16) )
  ISN 00046              EQUIVALENCE    ( VELFJ (1),FA(17) )
  ISN 00047              EQUIVALENCE    ( VELGJ (1),FA(18) )
  ISN 00048              EQUIVALENCE    ( VELJ  (1),FA(19) )
  ISN 00049              EQUIVALENCE    ( VELFJO(1),FA(20) )
  ISN 00050              EQUIVALENCE    ( VELGJO(1),FA(21) )
  ISN 00051              EQUIVALENCE    ( VELJO (1),FA(22) )
  ISN 00052              EQUIVALENCE    ( VOIOFJ(1),FA(23) )
  ISN 00053              EQUIVALENCE    ( VOIOGJ(1),FA(24) )
  ISN 00054              EQUIVALENCE    ( DIAMJ (1),FA(25) )
  ISN 00055              EQUIVALENCE    ( JC    (1),FA(26) )                                      ###IA-FA#
                C        JC USES TWO WORDS.
  ISN 00056              EQUIVALENCE    ( JUNNO (1),FA(28) )                                      ###IA-FA#
  ISN 00057              EQUIVALENCE    ( ATHROT(1),FA(29) )
  ISN 00058              EQUIVALENCE    ( VOIDO (1),FA(30) )
  ISN 00059              EQUIVALENCE    ( VOIOT (1),FA(31) )
  ISN 00060              EQUIVALENCE    ( ARAT  (1),FA(32) )
                C  ARAT USES TWO WORDS
  ISN 00061              EQUIVALENCE    ( FAAJ  (1),FA(34) )
  ISN 00062             EQUIVALENCE (MFLOWJ(1),FA(35))
  ISN 00063             EQUIVALENCE (JUNFTL(1),FA(37))                                             ###IA-FA#
                *CEND                                                                               DEVL END
                *CALL STATC
                C
                C####  INTEGER STSRDC(1),STSSKP(1),STSJPT(1),STSATP(1),STSREQ(1),                 ########
                C#   * STSLTE(1),STSSCL(1),STSRCL(1),STSRXL(1),STSREX(1),                            #
                C#####* STSRTE(1),STSRPE(1),STSJCK(1)                                              ########
  ISN 00064             INTEGER            STSSKP(2,1)        ,STSATP(2,1)                      INTEGER
  ISN 00065             INTEGER                      STSJPT(2,1)        ,STSREQ(2,1)              INTEGER
  ISN 00066             REAL*8  STSRDC(1),                                                        PACKWORD
                       * STSLTE(1),STSSCL(1),STSRCL(1),STSRXL(1),STSREX(1),                      PACKWORD
                       * STSRTE(1),STSRPE(1),STSJCK(1)                                           PACKWORD
  ISN 00067             REAL*8STSCPU(1),STSDTM(1),STSDTX(1),STSDTA(1)                             #REAL*8#
  ISN 00068             EQUIVALENCE (STSRDC(1),LFA(1)),(STSSKP(1),LFA(2)),                        #LIA-LFA
                       * (STSJPT(1),LFA(3)),(STSATP(1),LFA(4)),(STSREQ(1),LFA(5)),               #LIA-LFA
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                     * (ST$CPU(1),LFA(6)),(ST$DTM(1),LFA(7)),(ST$DTX(1),LFA(8)),
                     * (ST$OTA(1),LFA(9)),(ST$LTE(1),LFA(10)),(ST$$CL(1),LFA(11)),      #LIA-LFA
                     * (ST$RCL(1),LFA(12)),(ST$RXL(1),LFA(13)),(ST$REX(1),LFA(14)),     #LIA-LFA
                     * (ST$RTE(1),LFA(15)),(ST$RPE(1),LFA(16)),(ST$JCK(1),LFA(17)       #LIA-LFA
                *CEND                                                                   DEVL END
                *CALL TIMEC
                C
                C  TRANSIENT TIMING COMMON.
ISN 00069            COMMON /TIMEC/ TIME1(19),NENTRY(19)
                *CEND                                                                   DEVL END
                *CALL TRNHLP
                C
ISN 00070            COMMON /TRNHLP/ IC,IV,IVE,IVSKP,IJ,IJE,IJSKP,IXIP,IXV,IXPC,
                     * IXIRHR,IXIRM,IXCOFP,IXCOFE,IXCOFX,IXSOE,IXSOP,IXSOPE,IXVP,
                     * NVR,NVRP,NNI,NNI2,GERR,GERRS,MTYPE,SFLAG,INT,ENTE,LNTSOL
ISN 00071            LOGICAL SFLAG
ISN 00072            EQUIVALENCE (IXIPR,FILNDX(7))
                *CEND                                                                   DEVL END
                *CALL TRPBLK
                C
                C  TRIP BLOCK
                C####  INTEGER NTRP(1),NTRPST(1),NTRCV1(1),NTRCV2(1),NTRNV1(1),        ########
                C##### NTRNV2(1),NTRPC1(1),NTRPC2(1),NTRTR1(1),NTRTR2(1)               ########
ISN 00073            REAL*8          NTRCV1(1),NTRCV2(1)                            CHARACTR
ISN 00074            REAL*8  NTRP(1),NTRPST(1),          NTRNV1(1),                 PACKWORD
                     * NTRNV2(1),NTRPC1(1),NTRPC2(1),NTRTR1(1),NTRTR2(1)            PACKWORD
ISN 00075            REAL*8TRPTIM(1),TRPCON(1)                                      #REAL*8#
ISN 00076            EQUIVALENCE (NTRP(1),LFA(1)),(NTRPST(1),LFA(2)),               #LIA-LFA
                     * (TRPTIM(1),LFA(3)),(NTRCV1(1),LFA(4)),(NTRCV2(1),LFA(5)),    #LIA-LFA
                     * (NTRNV1(1),LFA(6)),(NTRNV2(1),LFA(7)),(NTRPC1(1),LFA(8)),    #LIA-LFA
                     * (NTRPC2(1),LFA(9)),(TRPCON(1),LFA(10))                       #LIA-LFA
ISN 00077            EQUIVALENCE (NTRTR1(1),LFA(4)),(NTRTR2(1),LFA(5))              #LIA-LFA
                *CEND                                                                   DEVL END
                *CALL TSTPCT
                C
ISN 00078            REAL*8TSPEND(1),DTMIN(1),DTMAX(1)                              #REAL*8#
                C####  INTEGER CURCTL(1),TSPPAC(1)                                   ########
ISN 00079            REAL*8  CURCTL(1),TSPPAC(1)                                    PACKWORD
ISN 00080            EQUIVALENCE (CURCTL(1),FA(1)),(TSPEND(1),FA(2)),               ##IA-FA#
                     * (DTMIN(1),FA(3)),(DTMAX(1),FA(4)),(TSPPAC(1),FA(5))          ##IA-FA#
                *CEND                                                                   DEVL END
                *CALL VOLDAT
                C
                C  VOLUME BLOCK
ISN 00081            REAL*8(ANV(1),DMOP(1),DMDRU(1),DMDX(1),DDTM(1),DROP(1),        #REAL*8#
                     * DRDRU(1),DRDX(1),
                     * P     (1), PO    (1), Q     (1), QUALE (1), QUALS (1), QUALSO(1),
                     * RHO   (1), RHOF  (1), RHOG  (1), RHOM  (1), RHOO  (1), U     (1),
                     * UF    (1), UG    (1), UO    (1), V     (1), VELF  (1), VELG  (1),
                     * VNEV  (1), VOIDF (1), VOIDG (1), TEMP  (1), ROUGHV(1), AVOL  (1),
                     * TEMPF(1),TEMPG(1),DZ(1),DL(1),SOUNDE(1),
                     * FVALF (1), FVALG (1), SATT  (1), SATVF (1), SATVG (1),
                     * SATHF(1), SATHG(1), SATCPF(1), SATCPG(1), CPSPH(1),
                     * FAAV(1),VISCF(1),VISCG(1),SIGMA(1),QUALA(1),QUALAO(1),
                     * DRDA(1),DMDA(1),BORON(1),BORONO(1),DDTMO(1)
                C####  INTEGER NVOLS(1),NVSKP(11),VCTRL(1),VOLNO(1),IMAP(1)          ########
ISN 00082            INTEGER NVOLS(2,1)                                             INTEGER
ISN 00083            INTEGER          NVSKP(2,11),       VOLNO(2,1)                 INTEGER
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ISN 00084            REAL*8                      VCTRL(1),       IMAP(1)           PACKWORD
                C
ISN 00085             EQUIVALENCE    ( NVOLS (1),FA( 1) )                          ##IA-FA#
ISN 00086             EQUIVALENCE    ( NVSKP (1),FA( 2) )                          ##IA-FA#
ISN 00087             EQUIVALENCE    ( ROUGHV(1),FA( 3) )
ISN 00088             EQUIVALENCE    ( DIANV (1),FA( 4) )
ISN 00089             EQUIVALENCE    ( DMOP  (1),FA( 5) )
ISN 00090             EQUIVALENCE    ( DMDRU (1),FA( 6) )
ISN 00091             EQUIVALENCE    ( DMDX  (1),FA( 7) )
ISN 00092             EQUIVALENCE    ( DDTM  (1),FA( 8) )
ISN 00093             EQUIVALENCE    ( SOUNDE(1),FA( 9) )
ISN 00094             EQUIVALENCE    ( VCTRL (1),FA(10) )                          ##IA-FA#
ISN 00095             EQUIVALENCE    ( DROP  (1),FA(11) )
ISN 00096             EQUIVALENCE    ( DRDRU (1),FA(12) )
ISN 00097             EQUIVALENCE    ( DRDX  (1),FA(13) )
ISN 00098             EQUIVALENCE    ( VOLNO (1),FA(14) )                          ##IA-FA#
ISN 00099             EQUIVALENCE    ( P     (1),FA(15) )
ISN 00100             EQUIVALENCE    ( QUALS (1),FA(16) )
ISN 00101             EQUIVALENCE    ( U     (1),FA(17) )
ISN 00102             EQUIVALENCE    ( TEMP  (1),FA(18) )
ISN 00103             EQUIVALENCE    ( RHO   (1),FA(19) )
ISN 00104             EQUIVALENCE    ( PO    (1),FA(20) )
ISN 00105             EQUIVALENCE    ( QUALSO(1),FA(21) )
ISN 00106             EQUIVALENCE    ( UO    (1),FA(22) )
ISN 00107             EQUIVALENCE    ( RHOO  (1),FA(23) )
ISN 00108             EQUIVALENCE    ( RHOM  (1),FA(24) )
ISN 00109             EQUIVALENCE    ( QUALE (1),FA(25) )
ISN 00110             EQUIVALENCE    ( RHOF  (1),FA(26) )
ISN 00111             EQUIVALENCE    ( RHOG  (1),FA(27) )
ISN 00112             EQUIVALENCE    ( UF    (1),FA(28) )
ISN 00113             EQUIVALENCE    ( UG    (1),FA(29) )
ISN 00114             EQUIVALENCE    ( V     (1),FA(30) )
ISN 00115             EQUIVALENCE    ( VNEV  (1),FA(31) )
ISN 00116             EQUIVALENCE    ( VELF  (1),FA(32) )
ISN 00117             EQUIVALENCE    ( VELG  (1),FA(33) )
ISN 00118             EQUIVALENCE    ( VOIDF (1),FA(34) )
ISN 00119             EQUIVALENCE    ( VOIDG (1),FA(35) )
ISN 00120             EQUIVALENCE    ( AVOL  (1),FA(36) )
ISN 00121             EQUIVALENCE    ( TEMPF (1),FA(37) )
ISN 00122             EQUIVALENCE    ( TEMPG (1),FA(38) )
ISN 00123             EQUIVALENCE    ( DZ    (1),FA(39) )
ISN 00124             EQUIVALENCE    ( DL    (1),FA(40) )
ISN 00125             EQUIVALENCE    ( Q     (1),FA(41) )
ISN 00126            EQUIVALENCE (IMAP(1),FA(42))                                   ##IA-FA#
ISN 00127             EQUIVALENCE    ( FVALF (1), FA(43) )
ISN 00128             EQUIVALENCE    ( FVALG (1), FA(44) )
ISN 00129             EQUIVALENCE    ( SATT  (1),FA(45) )
ISN 00130             EQUIVALENCE    ( SATVF (1),FA(46) )
ISN 00131             EQUIVALENCE    ( SATVG (1),FA(47) )
ISN 00132             EQUIVALENCE    ( SATHF (1),FA(48) )
ISN 00133             EQUIVALENCE    ( SATHG (1),FA(49) )
ISN 00134             EQUIVALENCE    ( SATCPF(1),FA(50) )
ISN 00135             EQUIVALENCE    ( SATCPG(1),FA(51) )
ISN 00136             EQUIVALENCE    ( CPSPH (1),FA(52) )
ISN 00137             EQUIVALENCE     ( FAAV  (1),FA(53),)
ISN 00138             EQUIVALENCE    ( VISCF (1),FA(54) )
ISN 00139             EQUIVALENCE    ( VISCG (1),FA(55) )
ISN 00140             EQUIVALENCE    ( SIGMA (1),FA(56) )
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   ISN 00141            EQUIVALENCE    ( QUALA (1), FA(57) )
   ISN 00142            EQUIVALENCE    ( QUALAO(1), FA(58) )
   ISN 00143            EQUIVALENCE    ( DROA  (1), FA(59) )
   ISN 00144            EQUIVALENCE    ( DMOA  (1), FA(60) )
   ISN 00145            EQUIVALENCE    (BORON(1)  , FA(61)  )
   ISN 00146            EQUIVALENCE    (BORONO(1) , FA(62)  )
   ISN 00147            EQUIVALENCE    (DOTMO(1)  , FA(63) )
                  C  ADDITIONAL VARIBLES FOR TIME DEPENDENT VOLUMES.
   ISN 00148           REAL*8DP(1), DPO(1)                                            #REAL*8#
   ISN 00149           EQUIVALENCE  (DP(1),DMOX(1)), (DPO(1),DOTM(1))
                  *CEND                                                               DEVL END
                  C
   ISN 00150          DIMENSION JECF(2),DTNM(2)
   ISN 00151           INTEGER OUTPT
   ISN 00152           REAL*8  IECF,IPLT                                              PACKWORD
   ISN 00153           LOGICAL SKIP,LAST
                  C
                  C  DATA STATEMENTS
   ISN 00154          DATA NCORAN/2/
   ISN 00155           DATA SKIP/.FALSE./
                  C&       DATA OUTPT/6LOUTPUT/
   ISN 00156           DATA OUTPT/6      /                                            &JA
   ISN 00157           DATA NANY/100/
   ISN 00158           DATA BIT / Z 00000000 40008001 /                               ###
                  C
   ISN 00159           AFLAG = .FALSE.
   ISN 00160           LAST = .FALSE.
                  C¥       IECF = 0
   ISN 00161           IECF = DBIT(0)                                                 ¥JA
                  C¥       IPLT = 0
   ISN 00162           IPLT = DBIT(0)                                                 ¥JA
                  C
   ISN 00163          IF ( SKIP )  GO TO  10
   ISN 00164          I          =  FILNDX(2)
                  C  CHECK FOR RESTART
                  C¥       IF (CURCTL(FILNDX(2)) .EQ. 0) GO TO 5
   ISN 00165           IF (LEQ(CURCTL(FILNDX(2)),DBIT(0))) GO TO 5                    ¥JA
                  C  RESTART
                  C¥       ICARD = .NOT.MASK(45) .AND. SHIFT(CURCTL(FILNDX(2)),15)
   ISN 00166           ICARD = IDAND(DNOT(DMASK(45)),SHIFT(CURCTL(FILNDX(2)),15))     ¥JA
   ISN 00167           I = I + ICARD - 1
                  C¥       IECF = SHIFT(MASK(2),59)
   ISN 00168           IECF = SHIFT(DMASK(2),59)                                      ¥JA
   ISN 00169           SKIP = .TRUE.
   ISN 00170           GO TO 7
                  C  NEW PROBLEM
   ISN 00171        5  ICARD = 1
                  C¥       CURCTL(FILNDX(2)) = (.NOT.MASK(15).AND.TSPPAC(I)) .OR.
                  C¥     * SHIFT(ICARD,45)
   ISN 00172           CURCTL(FILNDX(2)) = DOR(DAND(DNOT(DMASK(15)),TSPPAC(I)),SHIFTI(IC¥JA
                        *ARD,45))                                                     ¥JA
   ISN 00173           AFLAG = .TRUE.
                  C¥       IECF = MASK(4)
   ISN 00174           IECF = DMASK(4)                                                ¥JA
                  C¥       IPLT = MASK(4)
   ISN 00175           IPLT = DMASK(4)                                                ¥JA
   ISN 00176        7 DTHY      =  DTMAX(I)
   ISN 00177          DTMT      =  DTMAX(I)


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   ISN 00178          DTLIMT    =  DTMIN(I)
   ISN 00179           IF (NREPET .NE. 0) GO TO 4
   ISN 00180          NREPET    =  1
   ISN 00181           NSTSP = NSTSP - 1
                  C¥       CURCTL(FILNDX(2)) = CURCTL(FILNDX(2)) + 0000100001000018
   ISN 00182           CURCTL(FILNDX(2)) = DADD(CURCTL(FILNDX(2)), BIT )              ###
   ISN 00183       4   IF (SKIP) GO TO 10
   ISN 00184           SKIP = .TRUE.
   ISN 00185           DT = DTHY
                  C¥ 10    ICARD = .NOT.MASK(45) .AND. SHIFT(CURCTL(FILNDX(2)),15)
   ISN 00186      10   ICARD = IDAND(DNOT(DMASK(45)),SHIFT(CURCTL(FILNDX(2)),15))     ¥JA
   ISN 00187           I = FILNDX(2) + ICARD
                  C¥       J = .NOT.MASK(54) .AND. SHIFT(TSPPAC(I-1),15)
   ISN 00188           J = IDAND(DNOT(DMASK(54)),SHIFT(TSPPAC(I-1),15))               ¥JA
   ISN 00189           RENOD = J .NE. 0
   ISN 00190           DTREM = REMTIM(DTREM)
   ISN 00191           IF (DTREM .GT. CPUREM(1)) GO TO 22
   ISN 00192           DONE = -4
   ISN 00193           GO TO 15
   ISN 00194      22   IF (HELP) 11,12,13
   ISN 00195      11   IF (HELP .EQ. (-2)) GO TO 17
   ISN 00196           DONE = -3
   ISN 00197           FAIL = .TRUE.
   ISN 00198           GO TO 15
   ISN 00199      17   HELP = 0
   ISN 00200           GO TO 12
   ISN 00201      13   IF (HELP .GT. 2) GO TO 12
   ISN 00202           HELP = -HELP
   ISN 00203      38   SUCCES = MAX0(SUCCES,1)
   ISN 00204      19   TIMEHY = TIMEHY - DT
   ISN 00205           WRITE (OUTPT,2004)
   ISN 00206    2004   FORMAT ('0******** TROUBLE, LAST ADVANCEMENT BEING REPEATED WITH
                      *DEBUG PRINTOUT.')
   ISN 00207           GO TO 14
   ISN 00208      12   IF (.NOT.FAIL) GO TO 37
   ISN 00209           HELP = -1
   ISN 00210           GO TO 38
   ISN 00211      37   DTADJ = DT
   ISN 00212           IF(SUCCES.GT.1) GO TO 25
                  CX       IF (ERRMAX .GT. 2.0E-3) SUCCES = 1
   ISN 00213           IF (ERRMAX .GT. 2.0D-3) SUCCES = 1                             ###
   ISN 00214           IF (SUCCES .EQ. 0) GO TO 100
                  C  UNSUCCESSFUL, CHECK WHETHER TIME STEP SHOULD BE REPEATED WITH HALVED
                  C  TIME STEP.
   ISN 00215           IF(J.NE.0) GO TO 25
   ISN 00216           SUCCES = 0
   ISN 00217           NREPET = NREPET - 1
   ISN 00218           GO TO 101
   ISN 00219      25   NREPET = NREPET + NREPET
   ISN 00220           TIMEHY = TIMEHY - DT
                  CX       DT = 0.5*DT
   ISN 00221           DT = 0.5D0*DT                                                  ZJA
                  CX       IF (0.5*DT .LE. DTLIMT) RENOD = .TRUE.
   ISN 00222           IF (0.5D0*DT .LE. DTLIMT) RENOD = .TRUE.                       ZJA
   ISN 00223           IF (DT .LE. DTLIMT) GO TO 70
                  C       LOAD OLD-TIME VALUES FOR HALVED TIME-STEP
   ISN 00224      14   CALL MOVER
   ISN 00225           IF (J .EQ. 2) TIMEHT = TIMEHY
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                CX      STSROC(FILNDX(20)) = STSROC(FILNDX(20)) + 1
   ISN 00226            STSROC(FILNDX(20)) = DADD(STSROC(FILNDX(20)),DBIT(1))                          XJA
   ISN 00227            DO 23 K = IV,IVE,IVSKP
                CX        VCTRL(K) = SHIFT(SHIFT(MASK(5),13).AND.VCTRL(K),11) .OR.
                CX     *    (SHIFT(MASK(44),8).AND.VCTRL(K))                                           JETPMP
   ISN 00228            VCTRL(K) = DOR(SHIFT(DAND(SHIFT(DMASK(5),13),VCTRL(K)),11),DAND(XJA
                       *(SHIFT(DMASK(44),8),VCTRL(K)))                                                 JETPMP
   ISN 00229         23  CONTINUE
   ISN 00230             GO TO  450
   ISN 00231         70  DT = DT + DT
   ISN 00232             TIMEHY = TIMEHY + DT
   ISN 00233             NREPET   =  NREPET/2
   ISN 00234             IF (SUCCES -2) 71,36,34
   ISN 00235         36  WRITE (OUTPT,2001)
   ISN 00236       2001  FORMAT ('0********** WATER PROPERTY ERROR WITH MINIMUM TIME STEP, T
                        *RANSIENT BEING TERMINATED.')
   ISN 00237             GO TO 33
   ISN 00238         34  WRITE (OUTPT,2005)
   ISN 00239       2005  FORMAT ('0********** NON DIAGONAL MATRIX WITH MINIMUM TIME STEP, TR
                        *ANSIENT BEING TERMINATED.')
   ISN 00240         33  HELP = -1
   ISN 00241             GO TO 19
   ISN 00242         71  IF (NANY .LE. 0) GO TO 72
   ISN 00243             NANY = NANY - 1
   ISN 00244             WRITE (OUTPT,2002) NCOUNT,TIMEHY
   ISN 00245       2002  FORMAT ('0YYYY ADVANCEMENT'I8,' FOR TIME ='1PE14.6,' HAD EXCESSIV
                        *E ERROR AT THE MINIMUM TIME STEP.')
   ISN 00246             IF (NANY .EQ. 0) WRITE (OUTPT,2003)
   ISN 00247       2003  FORMAT (' ABOVE MESSAGE BEING SUPPRESSED AFTER 100 OCCURANCES.')
   ISN 00248         72  SUCCES = 0
                C      IF ERRMAX IS SMALL, DOUBLE HALVED TIME-STEP
   ISN 00249        100  NREPET = NREPET - 1
                CX     IF (J.GT.0 .AND. ERRMAX.GT.2.0E-4 .AND. DT.GE.DTLIMT) GO TO 150
   ISN 00250            IF (J.GT.0 .AND. ERRMAX.GT.2.00-4 .AND. DT.GE.DTLIMT) GO TO 150  XJA
   ISN 00251        101  IF (MOD(NREPET,2) .NE. 0) GO TO 150
   ISN 00252             DTADJ = DTADJ + DTADJ
   ISN 00253            NREPET   =  NREPET/2
                C
                C      STORE NEW-TIME VALUES FOR DT ADVANCEMENT
                C
   ISN 00254        150  CALL MOVER
                CX        IF (IECF .NE. 0) GO TO 122
   ISN 00255            IF (LNE(IECF,DBIT(0))) GO TO 122                                               XJA
   ISN 00256            J = FILNDX(20)
                CX     IVSKP2= STSSKP(J)
   ISN 00257            IVSKP2= STSSKP(2,J)                                                            XJA
                CX     STSDTN(J) = AMIN1(STSDTN(J),DT)
   ISN 00258            STSDTN(J) = DMIN1(STSDTN(J),DT)                                                XJA
                CX     STSDTX(J) = AMAX1(STSDTX(J),DT)
   ISN 00259            STSDTX(J) = DMAX1(STSDTX(J),DT)                                                XJA
   ISN 00260            STSDTA(J) = STSDTA(J) + DT
   ISN 00261            DO 24 K = IV,IVE,IVSKP
                CX        IF (SHIFT(VCTRL(K),47) .LT. 0) STSLTE(J) = STSLTE(J) + 1
   ISN 00262            IF (LLT(SHIFT(VCTRL(K),47),DBIT(0))) STSLTE(J) = DADD(STSLTE(J))XJA
                       *,DBIT(1))                                                                      XJA
                CX        IF (SHIFT(VCTRL(K),37) .LT. 0) STSRXL(J) = STSRXL(J) + 1
   ISN 00263            IF (LLT(SHIFT(VCTRL(K),37),DBIT(0))) STSRXL(J) = DADD(STSRXL(J))XJA
                       *,DBIT(1))                                                                      XJA
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                CX        IF (SHIFT(VCTRL(K),38) .LT. 0) STSREX(J) = STSREX(J) + 1
   ISN 00264            IF (LLT(SHIFT(VCTRL(K),38),DBIT(0))) STSREX(J) = DADD(STSREX(J))XJA
                       *,DBIT(1))                                                                      XJA
                CX        IF (SHIFT(VCTRL(K),39) .LT. 0) STSRTE(J) = STSRTE(J) + 1
   ISN 00265            IF (LLT(SHIFT(VCTRL(K),39),DBIT(0))) STSRTE(J) = DADD(STSRTE(J))XJA
                       *,DBIT(1))                                                                      XJA
                CX        IF (SHIFT(VCTRL(K),40) .LT. 0) STSRPE(J) = STSRPE(J) + 1
   ISN 00266            IF (LLT(SHIFT(VCTRL(K),40),DBIT(0))) STSRPE(J) = DADD(STSRPE(J))XJA
                       *,DBIT(1))                                                                      XJA
                CX        VCTRL(K) = SHIFT(MASK(44),8) .AND. VCTRL(K)                                 JETPMP
   ISN 00267            VCTRL(K) = DAND(SHIFT(DMASK(44),8),VCTRL(K))                                   JETPMP
   ISN 00268            J = J + IVSKP2
   ISN 00269         24  CONTINUE
                CX     K = STSJPT(FILNDX(20)) + FILNDX(20)
   ISN 00270            X = STSJPT(2,FILNDX(20)) + FILNDX(20)                                          XJA
   ISN 00271            DO 121 J = IJ,IJE,IJSKP
                CX        IF (IJ2(J) .LT. 0) STSJCK(K) = STSJCK(K) + 1
   ISN 00272            IF (LLT(IJ2(J),DBIT(0))) STSJCK(K) = DADD(STSJCK(K),DBIT(1))   XJA
   ISN 00273            X = X + 1
   ISN 00274        121  CONTINUE
                C  INITIALIZE EDIT CONTROL FLAGS.
                C*122  IECF = TSPPAC(I-1) .OR. IECF
   ISN 00275        122  IECF = DOR(TSPPAC(I-1),IECF)                                                  XJA
   ISN 00276             IF (NREPET .NE. 0) GO TO 27
                C
                C      GET NEW TIME-STEP AFTER SUCCESSFUL ADVANCEMENT TO ORIGINAL NEWTIME
                C      DO NECESSARY EDITS AND PLOT RECORDS
   ISN 00277             AFLAG     = .TRUE.
   ISN 00278             NSTSP     =  NSTSP + 1
   ISN 00279             IF (OTREM .LE. CPUREM(2)) DONE = -4
                CX        IF (FILIO(18) .EQ. 0.0) GO TO 16
   ISN 00280            IF (FILIO(18) .EQ. 0.000) GO TO 16                                             XJA
                CX     K = .NOT.MASK(43) .AND. SHIFT(NTRPST(FILNDX(18)),18)
   ISN 00281            K = IDAND(DNOT(DMASK(43)),SHIFT(NTRPST(FILNDX(18)),18))                        XJA
   ISN 00282            IF (K .EQ. 0) GO TO 16
                CX     IF (TRPTIM(K-2) .GE. 0.0) DONE = -2
   ISN 00283            IF (TRPTIM(K-2) .GE. 0.000) DONE = -2                                          XJA
                CX     K = .NOT.MASK(43) .AND. SHIFT(NTRPST(FILNDX(18)),48)
   ISN 00284            K = IDAND(DNOT(DMASK(43)),SHIFT(NTRPST(FILNDX(18)),48))                        XJA
   ISN 00285            IF (K .EQ. 0) GO TO 16
                CX     IF (TRPTIM(K-2) .GE. 0.0) DONE = -2
   ISN 00286            IF (TRPTIM(K-2) .GE. 0.000) DONE = -2                                          XJA
   ISN 00287         16  LAST = TIMEHY + DTMIN(I-1) .GT.  TSPEND(I-1)
   ISN 00288             IF (.NOT.LAST) GO TO 33
   ISN 00289             J = ICARD + 4
   ISN 00290             IF (J .LT. FILSIZ(2)) GO TO 32
   ISN 00291             LAST = .FALSE.
   ISN 00292             DONE = -1
   ISN 00293             GO TO 15
   ISN 00294         32  I = I + 4
   ISN 00295             GO TO 15
   ISN 00296         33  IF (DONE .EQ. 0) GO TO 26
                CX 15     IECF = MASK(4)
   ISN 00297         15  IECF = DMASK(4)                                                              XJA
                CX        IPLT = MASK(4)
   ISN 00298            IPLT = DMASK(4)                                                                XJA
   ISN 00299             GO TO 27
                CX 26  MIEOT = (.NOT.MASK(45).AND.SHIFT(CURCTL(FILNDX(2)),30)) - 1
```

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FACOM OSIV/F4 FORTRAN IV (HE)  V04L18      DTSTEP  DATE 83.07.06  TIME 13.40.24                              PAGE    9

   ISN 00300        26  MIEDT = IDAND(DNOT(DMASK(45)),SHIFT(CURCTL(FILNDX(2)),30))-1        ¥JA
               C¥       MJEDT = (.NOT.MASK(45).AND.SHIFT(CURCTL(FILNDX(2)),45)) - 1
   ISN 00301            MJEDT = IDAND(DNOT(DMASK(45)),SHIFT(CURCTL(FILNDX(2)),45))-1        ¥JA
               C¥       NREST = (.NOT.MASK(45).AND.CURCTL(FILNDX(2))) - 1
   ISN 00302            NREST = IDAND(DNOT(DMASK(45)),CURCTL(FILNDX(2)))-1                  ¥JA
   ISN 00303            IF (MIEDT .NE. 0) GO TO 28
               C¥       MIEDT = .NOT.MASK(45) .AND. SHIFT(TSPPAC(I-1),30)
   ISN 00304            MIEDT = IDAND(DNOT(DMASK(45)),SHIFT(TSPPAC(I-1),30))                ¥JA
               C¥       IECF = MASK(2) .OR. IECF
   ISN 00305            IECF = DOR(DMASK(2),IECF)                                           ¥JA
               C¥       IPLT = MASK(4)
   ISN 00306            IPLT = DMASK(4)                                                     ¥JA
   ISN 00307        28  IF (MJEDT .NE. 0) GO TO 29
               C¥       MJEDT = .NOT.MASK(45) .AND. SHIFT(TSPPAC(I-1),45)
   ISN 00308            MJEDT = IDAND(DNOT(DMASK(45)),SHIFT(TSPPAC(I-1),45))                ¥JA
               C¥       IECF = MASK(3) .OR. IECF
   ISN 00309            IECF = DOR(DMASK(3),IECF)                                           ¥JA
               C¥       IPLT = MASK(4)
   ISN 00310            IPLT = DMASK(4)                                                     ¥JA
   ISN 00311        29  IF (NREST .NE. 0) GO TO 30
               C¥       NREST = .NOT.MASK(45) .AND. TSPPAC(I-1)
   ISN 00312            NREST = IDAND(DNOT(DMASK(45)),TSPPAC(I-1))                          ¥JA
               C¥       IECF = MASK(4) .OR. IECF
   ISN 00313            IECF = DOR(DMASK(4),IECF)                                           ¥JA
               C¥       IECF = MASK(4)
   ISN 00314            IECF = DMASK(4)                                                     ¥JA
               C¥       IPLT = MASK(4)
   ISN 00315            IPLT = DMASK(4)                                                     ¥JA
               C¥ 30  CURCTL(FILNDX(2)) = SHIFT(ICARD,45) .OR. SHIFT(MIEDT,30) .OR.
               C¥    * SHIFT(MJEDT,15) .OR. NREST
   ISN 00316        30  CURCTL(FILNDX(2)) = DOR(DOR(DOR(SHIFTI(ICARD,45),SHIFTI(MIEDT,30)¥JA
                      *),SHIFTI(MJEDT,15)),DBIT(NREST))                                     ¥JA
               C  DO REQUESTED EDITS.
               C¥IF DEF,TIMED,2                                                             *IGNORED
   ISN 00317            CALL TIMEL (SAFE1)                                                     TIMED
   ISN 00318            TIMEI(1) = TIMEI(1) + SAFE1                                            TIMED
   ISN 00319        27  CALL TIMER (SAFE1)
   ISN 00320            STSCPU(FILNDX(20)) = STSCPU(FILNDX(20)) + SAFE1
               C¥       IECF = IECF .AND. PRINT
   ISN 00321            IECF = DAND(IECF,PRINT)                                             ¥JA
               C¥       IF (IECF .GE. 0) GOTO 40
   ISN 00322            IF (LGE(IECF,DBIT(0))) GOTO 40                                      ¥JA
               CX       IF (FILID(15) .EQ. 0.0) GO TO 41
   ISN 00323            IF (FILID(15) .EQ. 0.0D0) GO TO 41                                  XJA
               C¥       CALL PLTRECX
   ISN 00324            CALL PLTW01                                                         ¥JA
   ISN 00325            GO TO 40
   ISN 00326        41 CALL PLTREC
   ISN 00327        40 CONTINUE
               C¥       IF (SHIFT(IECF,1) .LT. 0) CALL MIREC
   ISN 00328            IF (LLT(SHIFT(IECF,1),DBIT(0))) CALL MIREC                          ¥JA
               C¥       IF (SHIFT(IECF,2) .LT. 0) CALL OUTPUT
   ISN 00329            IF (LLT(SHIFT(IECF,2),DBIT(0))) CALL OUTPUT                         ¥JA
               C¥       IF (SHIFT(IECF,3) .LT. 0) CALL RSTREC
   ISN 00330            IF (LLT(SHIFT(IECF,3),DBIT(0))) CALL RSTREC                         ¥JA
               C¥       IF (SHIFT(IPLT.AND.PRINT,3) .LT. 0) CALL PLTWRT
   ISN 00331            IF (LLT(SHIFT(DAND(IPLT,PRINT),3),DBIT(0))) CALL PLTWRT             ¥JA
   ISN 00332            IF (LLT(SHIFT(DAND(IPLT,PRINT),3),DBIT(0))) CALL PLTREC             ¥JA ← 追加
                                                                                                  プロッター file への書き込み
                                                                                                  を行う。

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               C¥       IF (LAST) CURCTL(FILNDX(2)) = (.NOT.MASK(15).AND.TSPPAC(I-1))
               C¥    * .OR. SHIFT(J,45)
   ISN 00333            IF (LAST) CURCTL(FILNDX(2)) = DOR(DAND(DNOT(DMASK(15)),TSPPAC(I-1¥JA
                      *)),SHIFTI(J,45))                                                     ¥JA
   ISN 00334            IF (DONE .EQ. 0) GO TO 18
               C¥       IF (SHIFT(IECF,1) .LT. 0) CALL MIREC
   ISN 00335            IF (LLT(SHIFT(IECF,1),DBIT(0))) CALL MIREC                          ¥JA
   ISN 00336            RETURN
   ISN 00337        18  DT = DTADJ
   ISN 00338            IF (NREPET .NE. 0) GO TO 330
   ISN 00339            DTHY = DTMAX(I-1)
   ISN 00340            IF (TIMEHY+DTHY+DTMIN(I-1) .GT. TSPEND(I-1))
                      * DTHY = TSPEND(I-1) - TIMEHY
   ISN 00341            DTHT = DTHY
   ISN 00342           DTLIMT   =  DTMIN(I-1)
   ISN 00343            DT = DTHY
   ISN 00344            NREPET = 1
               CX       DTADJ = 1.5*DTADJ
   ISN 00345            DTADJ = 1.5D0*DTADJ                                                 XJA
   ISN 00346       310  IF (DT .LE. DTADJ) GO TO 330
   ISN 00347            NREPET = NREPET + NREPET
               CX       DT = 0.5*DT
   ISN 00348            DT = 0.5D0*DT                                                       XJA
   ISN 00349           GO TO 310
               C  COMPUTE COURANT LIMIT AND REDUCE HYDRODYNAMIC TIME STEP IF NECESSARY.
   ISN 00350       330 DO 42 K =1,NCORAN
               CX 42 DTNM(K) =1.0E75
   ISN 00351        42 DTNM(K) =1.0D75                                                      XJA
               C¥       IECF=1
   ISN 00352            IECF = DBIT(1)                                                      ¥JA
   ISN 00353             J = FILNDX(20)
               CX        IVSKP2 = STSSKP(J)
   ISN 00354             IVSKP2 = STSSKP(2,J)                                               XJA
   ISN 00355             DO 20 K = IV,IVE,IVSKP
               C¥          IF (VCTRL(K) .LT. 0) GO TO 31
   ISN 00356               IF (LLT(VCTRL(K),DBIT(0))) GO TO 31                              ¥JA
               CX          DTADJ = AMAX1(ABS(VELF(K)),ABS(VELG(K)))
   ISN 00357               DTADJ = DMAX1(DABS(VELF(K)),DABS(VELG(K)))                       XJA
               CX       IF (DTADJ .LT. 1.0E-100) GO TO 31
   ISN 00358            IF (DTADJ .LT. 1.0D-76 ) GO TO 31                                   ###
   ISN 00359             DTADJ = DL(K)/DTADJ
               C¥       IF(DTADJ.GE.DTNM(IECF)) GO TO 31
   ISN 00360            IF(DTADJ.GE.DTNM(INTD(IECF))) GO TO 31                              ¥JA
               C¥       JECF(IECF)=J
   ISN 00361            JECF(INTD(IECF)) = J                                                ¥JA
               C¥       DTNM(IECF)=DTADJ
   ISN 00362            DTNM(INTD(IECF)) = DTADJ                                            ¥JA
   ISN 00363        31  J = J + IVSKP2
               C¥       IECF=IECF+1
   ISN 00364            IECF = DADD(IECF,DBIT(1))                                           ¥JA
               C¥       IF(IECF.GT.NCORAN) IECF=1
   ISN 00365            IF(LGT(IECF,DBIT(NCORAN))) IECF = DBIT(1)                           ¥JA
   ISN 00366        20  CONTINUE
               CX       DTN=0.0
   ISN 00367            DTN=0.0D0                                                           XJA
   ISN 00368            DO 52 K=1,NCORAN
               CX       IF(DTNM(K).EQ.1.0E75) GO TO 52
   ISN 00369            IF(DTNM(K).EQ.1.0D75) GO TO 52                                      XJA
```

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FACOM OSIV/F4 FORTRAN IV (HE)  V04L18     DTSTEP  DATE 83.07.06  TIME 13.40.24                                    PAGE   11

   ISN 00370          IF( DTNMCK).LE.DTN  ) GO TO 52
   ISN 00371          DTN=DTNMCK)
              CV      IECF=JECF(K)
   ISN 00372          IECF = DBIT(JECF(K))                                                          VJA
   ISN 00373       52 CONTINUE
   ISN 00374          IF(DTN) 450,450,451
              C#451   STSSCL(IECF) = STSSCL(IECF) + 1
   ISN 00375        451  STSSCL(INTO(IECF)) = DADD(STSSCL(INTO(IECF)),DBIT(1))                      ###
   ISN 00376          IF (DT .LE. DTN) GO TO 450
              CX 21   DT = 0.5*DT
   ISN 00377          21  DT = 0.500*DT                                                             VJA
   ISN 00378          NREPET = NREPET + NREPET
   ISN 00379          IF (DT .GT. DTN) GO TO 21
              C#      STSRCL(IECF) = STSRCL(IECF) + 1
   ISN 00380          STSRCL(INTO(IECF)) = DADD(STSRCL(INTO(IECF)),DBIT(1))                         ###
   ISN 00381        450 NCOUNT  =  NCOUNT + 1
   ISN 00382          TIMEHY   =  TIMEHY + DT
              CV      IF ((.NOT.MASK(54).AND.SHIFT(TSPPAC(I-1),15)) .NE. 2) RETURN
   ISN 00383          IF (IDAND(DNOT(DMASK(54)),SHIFT(TSPPAC(I-1),15)).NE.2) RETURN                 VJA
   ISN 00384          DTHT = DT
   ISN 00385          AFLAG = .TRUE.
   ISN 00386          RETURN                                                                        ###
   ISN 00387          END
```

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SPECIFIED OPTIONS: NONAME,FLAG(I),BYNAME,GOSYNT,NOSTATIS,ISN(D),NOMAP,ELM(*)

              *DECK GNINIT
   ISN 00001          SUBROUTINE GNINIT
              *CALL DECLARE                                                                        ########
              C.....................RELAP5/MOD1 IS IMPLEMENTED ON A FACOM M-200 COMPUTER#
   ISN 00002          IMPLICIT REAL*8(A-H,O-Z)                                                      AT  #
              C.............................DECLARE FUNCTION(FOR PACKWORD) TYPE....  JAPAN#
   ISN 00003          REAL*8   DAND,DOR,DNOT,SHIFT,DMASK,XOR,DADD,DBIT,SHIFTD,SHIFTI               ATOMIC#
   ISN 00004          INTEGER  INTO,IDAND,ISHIFT,I018                                              ENERGY#
   ISN 00005          LOGICAL  LLT,LLE,LEQ,LNE,LGT,LGE                                            RESEARCH
              C.....................................................................INSTITUTE
              *CEND                                                                                DEVL END
              C  SUBROUTINE PERFORMS ONCE ONLY CALCULATIONS AND GENERAL INITIALIZATION
              C  INCLUDING SETTING COMMON BLOCK LENGTH AND CLEARING THEM.
              *CALL COMCTL
              C
   ISN 00006          COMMON /COMCTL/ COMDAT(30),FIL10(30),FILSIZ(30),FILNDX(30),SAFE1
   ISN 00007          REAL*8          COMDAT                                                       PACKWORD
   ISN 00008          INTEGER FILSIZ,FILNDX
   ISN 00009          LOGICAL NEWRST
   ISN 00010          EQUIVALENCE (SAFE1,NEWRST)
              *CEND                                                                                DEVL END
              *CALL CONTRL
              C
   ISN 00011          COMMON /CONTRL/ DTHY,DTHT,DTN,DT,PRINT,TIMEHY,TIMENT,ERRMAX,
                     * TMASS,TMASSO,EMASS,EMASSO,AFLAG,SUCCES,DONE,NCOUNT,NSTSP,NREPET,
                     * HELP,CPUREM(2),SAFE2
              C####  INTEGER PRINT,DONE,HELP,SUCCES                                               ########
   ISN 00012          INTEGER       DONE,HELP,SUCCES                                             INTEGER
   ISN 00013          REAL*8  PRINT                                                              PACKWORD
   ISN 00014          LOGICAL AFLAG,RENOD
   ISN 00015          EQUIVALENCE (SAFE2,RENOD)
              *CEND                                                                                DEVL END
              *CALL FAST
              C                                                                                    LCM VERS
   ISN 00016          COMMON /FAST/ FA(100)                                                        ION;DEFI
   ISN 00017          INTEGER IA(2,100)                                                            NE SCOPE
   ISN 00018          EQUIVALENCE (FA(1),IA(1))                                                    O########
   ISN 00019          REAL*8 LFA(100)                                                              ##REAL*8#
   ISN 00020          INTEGER LIA(2,100)
   ISN 00021          EQUIVALENCE (LFA(1),LIA(1),FA(1))
              *CEND                                                                                DEVL END
              *CALL GENRL
              C
              C####  COMMON /GENRL/ CTITLE(10),FAIL,IROUTE,NCASE,PTITLE(7),                       ########
   ISN 00022          COMMON /GENRL/ CTITLE(12),FAIL,IROUTE,NCASE,PTITLE(9),                       CHARACTR
                     * UNITI,UNITO,SAFE3
              C####  INTEGER CTITLE,PTITLE                                                        ########
   ISN 00023          REAL*8  CTITLE,PTITLE                                                        CHARACTR
   ISN 00024          REAL*8                          IROUTE                                       PACKWORD
   ISN 00025          LOGICAL FAIL,UNITI,UNITO
              *CEND                                                                                DEVL END
              *CALL MAXMEM
              C
              C  MAXIMUM STORAGE.
   ISN 00026          COMMON /MAXMEM/ MAXSCM,MAXLCM
              *CEND                                                                                DEVL END
```

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FACOM OSIV/F4 FORTRAN IV (HE)  V04L18     GNINIT  DATE 83.07.06  TIME 13.40.26                                    PAGE   14

 ISN 00027          COMMON/JPDATA/NJP,NOCOM(4),DIA(7,4),RLENG(5,4),RAMDA(6,4),DUMYYY  JETPMP  追加 ジェットポンプデータ共通領域
                C#IF DEF,SCOPE3,3                                                    *IGNORED       Store後3. Sub.JETPにも
                C                                                                    *IGNORED       COMMON /JPDMY/ を入れる必要あり.
                C       COMMON /LCMEND/ LCMCOM                                       *IGNORED
                C       LEVEL 2,LCMCOM                                               *IGNORED
                C  LOCAL VARIABLE DEFINITION
 ISN 00028          INTEGER ISYS1(6),ISYS2(6)
                C  FUNCTION DEFINITION
                C#      REAL NEXTID
 ISN 00029          REAL*8 NEXTID                                                   XJA
                C  DATA STATEMENTS
 ISN 00030          DATA ISYS1/0,0,0,100,-1,-1/, ISYS2/0,0,0,5,-1,-1/
                C  ZERO SET TEH NUMBER OF JETPUMP COMPONENTS                         JETPMP  追加 ジェットポンプコンポーネント
 ISN 00031          NJP=0                                                           JETPMP       の数をゼロセット.
                C
                CX      IF (IROUTE .NE. -1) GO TO 10
 ISN 00032          IF (LNE(IROUTE,OBIT(-1))) GO TO 10                              XJA
                C  PERFORM FUNCTIONS NEEDED CALLED ONLY ONCE
 ISN 00033          CALL TIMSET(IV)
                C  SET PROGRAM TITLE
 ISN 00034          CALL HEADER (1,61,PTITLE)
                C  SET SUBROUTINE ERROR HANDLING
                C#      CALL SYSTEMC (30,ISYS1)
                C#      CALL SYSTEMC (115,ISYS2)
                C  SET MEMORY SIZE
 ISN 00035          MAXSCM = 0
 ISN 00036          MAXLCM = 0
 ISN 00037          CALL FTBMEM (MAXSCM,MAXLCM)
                C  INITIALIZE DYNAMIC STORAGE SUBROUTINES
 ISN 00038          CALL INITAL (2)
                C  SET FILES TO PROTECT CODING AND COMMON IN SCM AND LCM
                CX      CALL FTBRSV (1.0,1,-1,I)
 ISN 00039          CALL FTBRSV (1.000,1,-1,I)                                      XJA
                C#IF DEF,SCOPE2,2                                                   *IGNORED
                C       I = LOCF(LCMCOM) - LOCF(LFA(1))                             *IGNORED
                C       IF (I .GT. 0) CALL FTBRSV (-1.0,1,-2,IV)                    *IGNORED
                C#IF DEF,SCOPE1                                                     *IGNORED
                C#F DEF,SCOPE3,1                                                    *IGNORED
                C       CALL FTBRSV (-1.0,400,-2,IV)                                *IGNORED
                C#ENDIF                                                             *IGNORED
                C  DELETE FILES EXCEPT FOR PROTECT FILES AND DATA FILE ON DISK
                CX 10  IF (ISFDES(2.0) .EQ. 1) CALL DELETE (2.0)
 ISN 00040      10  IF (ISFDES(2.000) .EQ. 1) CALL DELETE (2.000)                  XJA
 ISN 00041          IL = NEXTID(3)
 ISN 00042          IF (IL .LT. 3) GO TO 12
 ISN 00043          DO 11 I = 3,IL
 ISN 00044            FID = I
 ISN 00045            IF (ISFDES(FID) .NE. 0) CALL DELETE (FID)
 ISN 00046            FID = -FID
 ISN 00047            IF (ISFDES(FID) .NE. 0) CALL DELETE (FID)
 ISN 00048      11  CONTINUE
                C
                C  SET FIXED COMMON BLOCK CONTROLS AND DYNAMIC STORAGE CONTROLS.  SET
                C  MOST FIXED COMMON BLOCKS TO INDEFINITE.  FOR FIXED COMMON CONTROLS,
                C  FIRST OCTAL DIGIT CONTAINS FLAG, 0 = WRITE ONLY ON FIRST WRITE ON
                C  RESTART TAPE OR START OF NEW TAPE, 1 = ALWAYS WRITE.  NEXT 9 OCTAL
                C  DIGITS CONTAIN LENGTH OF BLOCK.  NEXT 9 OCTAL DIGITS CONTAIN FIRST
                C  WORD ADDRESS OF BLOCK.  LAST OCTAL DIGIT CONTAINS SCM/LCM FLAG,
```

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                C  0 IF SCM, 4 IF LCM.
 ISN 00049          12  I = 0
                C  /COMCTL/
 ISN 00050          I = I + 1
                C#      COMDAT(I) = SHIFT(120,30) .OR. SHIFT(LOCF(COMDAT(1)),3)
 ISN 00051          COMDAT(I) = DOR(SHIFTI( 90,30),SHIFTI(LOCF(COMDAT(1)),3))       ###
                C#      DO 20 IV = 1,90
 ISN 00052          DO 20 IV = 1,60                                                 ###
                CX        FILID(IV) = 0.0
 ISN 00053          FILID(IV) = 0.000                                               XJA
 ISN 00054      20  CONTINUE
                C  /GENRL/
 ISN 00055          I = I + 1
                C#      COMDAT(I) = SHIFT(22,30) .OR. SHIFT(LOCF(CTITLE(1)),3)
 ISN 00056          COMDAT(I) = DOR(SHIFTI(25,30),SHIFTI(LOCF(CTITLE(1)),3))        ###
                C  /CONTRL/
 ISN 00057          I = I + 1
                C#      COMDAT(I) = SHIFT(1,57) .OR. SHIFT(21,30) .OR.
                C#    * SHIFT(LOCF(DTHY),3)
 ISN 00058          COMDAT(I) = DOR(DOR(SHIFTI(1,57),SHIFTI(18,30)),SHIFTI(LOCF(DTHY)###
                  *,3))                                                             ###
                C    ADDED FOR RESTART COMMON /JPDATA/                              JETPUMP
 ISN 00059          I=I+1                                                           JETPUMP  追加 Dynamic storage に
 ISN 00060          COMDAT(I)=DOR(SHIFTI(75,30),SHIFTI(LOCF(NJP),3))                JETPUMP       COMMON /JPDATA/ を登録.
                C  END OF COMMON BLOCKS                                                      これにより Restart が可能
 ISN 00061          I = I + 1                                                               になる.
                CX      COMDAT(I) = 0
 ISN 00062          COMDAT(I) = DBIT(0)                                             XJA
 ISN 00063          RETURN
```

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SPECIFIED OPTIONS: NONAME,FLAG(I),BYNAME,GOSTMT,NOSTATIS,ISN(0),NOMAP,ELM(*)

                *DECK RELAP5
                C###   PROGRAM RELAP5 (INPUT,OUTPUT,RSTIN,RSTPLT,TAPE5=INPUT,                    SCOPE1
                C### * TAPE6=OUTPUT,DEBUG=OUTPUT,PLOTFL,STM2XT)                                  SCOPE1
                CVIF DEF,SCOPE2,1                                                               *IGNORED
                C     * TAPE6=OUTPUT,DEBUG=OUTPUT,PLFILE,PLOTFL)                                *IGNORED
                CVIF DEF,SCOPE1,1                                                               *IGNORED
                *CALL DECLARE                                                                   ########
                C.....................................RELAP5/MOD1 IS IMPLEMENTED ON A FACOM M-200 COMPUTER#
   ISN 00001            IMPLICIT REAL*8(A-H,O-Z)                                                 AT   #
                C.....................................DECLARE FUNCTION(FOR PACKWORD) TYPE....   JAPAN#
   ISN 00002            REAL*8   DAND,DOR,DNOT,SHIFT,OMASK,XOR,DADD,DBIT,SHIFTD,SHIFTJ          ATOMIC#
   ISN 00003            INTEGER  INTD,IDAND,ISHIFT,IDIB                                         ENERGY#
   ISN 00004            LOGICAL  LLT,LLE,LEQ,LNE,LGT,LGE                                        RESEARCH
                C.....................................................................INSTITUTE
                *CEND                                                                           DEVL END
                C
                C  RELAP5, A COMPUTER PROGRAM TO SIMULATE A NUCLEAR REACTOR LOSS OF
                C  COOLANT ACCIDENT.
                C  PROGRAM SOLVES COUPLED TWO PHASE HYDRODYNAMICS, HEAT CONDUCTION,
                C  HEAT TRANSFER, AND REACTOR KINETICS EQUATIONS.
   ISN 00005            COMMON/JPDATA/NJP,NOCOM(4),DIA(7,4),RLENG(5,4),RAMDA(6,4),DUMYYY        JETPMP ←追加 ジェットポンプデータ最大4個
   ISN 00006            COMMON/JPUMP/DIAJP(7),RLJP(5),RAMJP(6),DUMXXX                           JETPMP       Share文, Sub. JETP には
                *CALL COMCTL                                                                                 COMMON /JPUMP/ を今まで通り入れる
                C
   ISN 00007             COMMON /COMCTL/ COMDAT(30),FILID(30),FILSIZ(30),FILNDX(30),SAFE1
   ISN 00008             REAL*8          COMDAT                                             PACKWORD
   ISN 00009             INTEGER FILSIZ,FILNDX
   ISN 00010             LOGICAL NEWRST
   ISN 00011             EQUIVALENCE (SAFE1,NEWRST)
                *CEND                                                                           DEVL END
                *CALL COMCTLC
                C
                C  COMDAT  LENGTH, LOCATION, AND SET FLAG FOR FIXED COMMON IN PACKED
                C  FORM.
                C  FILID   FTB FILID FOR DYNAMIC STORAGE FILES
                C  FILSIZ  LENGTH OF DYNAMIC FILE, POSITIVE IF IN SCM, NEGATIVE IF IN
                C  LCM.
                C  SAFE1   NOT  WRITTEN ON RESTART FILE, PROVIDED TO ALLOW LENGTH
                C          CHECKING WHEN READING FROM RESTART FILE.  USED FOR
                C          TIMER ARGUMENT WHEN TIMING TRANSIENT SUBROUTINE
                C          EXECUTION TIMES.
                C  NEWRST  TRUE IF A RESTART PROBLEM, USED DURING INPUT PROCESSING.
                C  FILNDX  INDEX OF DYNAMIC FILE IN FAST OR FTBLCM BLOCK.
                C  FILID(1)  INPUT DATA AND WORK SCRATCH SPACE
                C  FILID(2)  TIME STEP CONTROL BLOCK
                C  FILID(3)  COMPONENT DESCRIPTION BLOCK
                C  FILID(4)  HYDRODYNAMIC VOLUMES BLOCK
                C  FILID(5)  HYDRODYNAMIC JUNCTIONS BLOCK
                C  FILID(6)  WATER PROPERTY TABLE
                C  FILID(7)  HYDRODYNAMIC SOLUTION WORK SPACE
                C  FILID(8)  HEAT STRUCTURE GEOMETRY AND TEMPERATURE BLOCK
                C  FILID(9)  HEAT STRUCTURE MATERIAL PROPERTY STORAGE
                C  FILID(10) TABLE OF INLET AND OUTLET JUNCTIONS FOR EACH VOLUME
                C  FILID(11) GENERAL TABLE STORAGE
                C  FILID(12) MINOR EDIT FILE
                C  FILID(13) TIME DEPENDENT VOLUMES AND JUNCTIONS POINTERS


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                C  FILID(14) CATALOG INFORMATION FOR RESTART-PLOT FILE.
                C  FILID(15) PLOT HEADING AND CONTROL INFORMATION
                C  FILID(16) MINOR EDIT CONTROL, SAVE AREA, AND LABELS
                C  FILID(17) PLOT RECORD BUFFER.
                C  FILID(18) TRIP BLOCK.
                C  FILID(19) INTERNAL PLOT FILE CONTROL INFORMATION.
                C  FILID(20) FILE FOR STATISTICS DURING ADVANCEMENT.
                C  FILID(21) REACTOR KINETICS DATA.
                C  FILID(22) 2D PLOT REQUESTS AND SPECIFICATIONS
                C  FILID(23) PLOT COMPARISON DATA TABLES
                C  FILID(24) 3D PLOT REQUESTS AND SPECIFICATIONS
                C  FILID(25) PLOT RECORD BUFFER FOR INTERNAL PLOTS
                C  FILID(26) PLOT DATA FOR THE INTERNAL PLOT ROUTINES
                C  FILID(27)  CONTROL SYSTEM BLOCK
                *CEND                                                                           DEVL END
                *CALL CONTRL
                C
   ISN 00012            COMMON /CONTRL/ DTHY,DTHT,DTN,DT,PRINT,TIMEHY,TIMEHT,ERRMAX,
                       * TMASS,TMASSO,EMASS,EMASSO,AFLAG,SUCCES,DONE,NCOUNT,NSTSP,NREPET,
                       * HELP,CPUREM(2),SAFE2
                C####  INTEGER PRINT,DONE,HELP,SUCCES                                           ########
   ISN 00013            INTEGER        DONE,HELP,SUCCES                                         INTEGER
   ISN 00014            REAL*8  PRINT                                                           PACKWORD
   ISN 00015            LOGICAL AFLAG,RENOD
   ISN 00016            EQUIVALENCE (SAFE2,RENOD)
                *CEND                                                                           DEVL END
                *CALL CONTRX
                C
                C  DTHY    HYDRODYNAMIC TIME STEP REQUESTED BY USER.
                C  DTHT    HEAT STRUCTURE TIME STEP, CURRENTLY THE SAME AS DTHY.
                C  DTN     TIME STEP LIMIT DUE TO MATERIAL TRANSPORT STABILITY LIMIT
                C          (COURANT LIMIT).
                C  PRINT   PLOT ENABLE BIT (1 BIT), MINOR EDIT ENABLE BIT (1 BIT),
                C          MAJOR EDIT ENABLE BIT (1 BIT), RESTART ENABLE BIT (1 BIT),
                C          COMPLETE RESTART SWITCH (1 BIT), RESTART/PLOT FILE
                C          DISPOSITION CODE (4 BITS), NUMBER OF PLOT RECORDS (21 BITS),
                C          RESTART BLOCK NUMBER (30 BITS).
                C  TIMEHY  PROBLEM TIME FOR HYDRODYNAMIC ADVANCEMENTS.
                C  TIMEHT  PROBLEM TIME FOR HEAT STRUCTURE ADVANCEMENTS.
                C  ERRMAX  ERROR ESTIMATE USED IN TIME STEP CONTROL.
                C  TMASS   TOTAL MASS OF WATER IN SYSTEM CURRENTLY.
                C  TMASSO  TOTAL MASS OF WATER IN SYSTEM AT TIME = 0.0.
                C  EMASS   CURRENT MASS ERROR.
                C  AFLAG   IS SET TRUE WHEN HEAT STRUCTURES ARE TO BE ADVANCED.
                C  SUCCES  0 IF NO NEED TO REPEAT ADVANCEMENT WITH REDUCED TIME STEP, 1
                C          IF EXCESSIVE TRUNCATION ERROR, 2 IF WATER PROPERTY ERROR, 3
                C          IF NON-DIAGONAL MATRIX.
                C  DONE    ZERO IF ADVANCEMENTS ARE TO CONTINUE, NONZERO IF ADVANCEMENTS
                C          ARE TO BE TERMINATED.
                C  NCOUNT  COUNT OF NUMBER OF ADVANCEMENTS, SUCCESSFUL OR OTHERWISE.
                C  NSTSP   NUMBER OF STANDARD ADVANCEMENTS,
                C  NREPET  NUMBER OF HYDRODYNAMIC ADVANCEMENTS AT CURRENT DT TO FINISH
                C          A REQUESTED TIME STEP OF DTHY.
                C  HELP    USED TO CONTROL DEBUG EDITING AND TERMINATION.
                C  CPUREM  CONTAINS CPU REMAINING TIMES VALUES FROM INPUT.
                C  SAFE2   SAME PURPOSE AS SAFE1.
                C  RENOD   TRUE IF NEW PROBLEM OR RENODALIZATION CHANGES, USED DURING
                C          INPUT.
```

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                *CEND                                                                                          DEVL END
                *CALL CMPDAC
                C
                C  ACCUMULATOR COMPONENT VARIABLES
                C
                C  TANK VARIABLES
                C
ISN 00017             REAL*8        DIALN(1),LNELV(1),THICK(1),LNLEN(1),TTANK(1),                          #REAL*8#
                     *              TTANKO(1),THCND(1),HTCAP(1),RHOT(1),HTXR(1),QTANK(1),
                C
                C  HYDRODYNAMIC VARIABLES
                C
                     *      VDM(1),VDMO(1),VLIQ(1),VLIQO(1),RHON(1),RHONO(1),
                     *      TVAPO(1),CVN1T(1),VMASSO(1),BETAV(1),DPD(1),DPDDP(1)
                C#### INTEGER  ACCON(1)                                                                        ########
ISN 00018             REAL*8   ACCON(1)                                                                       PACKWORD
                C
ISN 00019             EQUIVALENCE  ( DIALN  (1), FA ( 6))
ISN 00020             EQUIVALENCE  ( LNELV  (1), FA ( 7))
ISN 00021             EQUIVALENCE  ( THICK  (1), FA ( 8))
ISN 00022             EQUIVALENCE  ( LNLEN  (1), FA ( 9))
ISN 00023             EQUIVALENCE  ( TTANK  (1), FA (10))
ISN 00024             EQUIVALENCE  ( TTANKO (1), FA (11))
ISN 00025             EQUIVALENCE  ( THCND  (1), FA (12))
ISN 00026             EQUIVALENCE  ( HTCAP  (1), FA (13))
ISN 00027             EQUIVALENCE  ( RHOT   (1), FA (14))
ISN 00028             EQUIVALENCE  ( HTXR   (1), FA (15))
ISN 00029             EQUIVALENCE  ( QTANK  (1), FA (16))
ISN 00030             EQUIVALENCE  ( VDM    (1), FA (17))
ISN 00031             EQUIVALENCE  ( VDMO   (1), FA (18))
ISN 00032             EQUIVALENCE  ( VLIQ   (1), FA (19))
ISN 00033             EQUIVALENCE  ( VLIQO  (1), FA (20))
ISN 00034             EQUIVALENCE  ( RHON   (1), FA (21))
ISN 00035             EQUIVALENCE  ( RHONO  (1), FA (22))
ISN 00036             EQUIVALENCE  ( TVAPO  (1), FA (23))
ISN 00037             EQUIVALENCE  ( CVN1T  (1), FA (24))
ISN 00038             EQUIVALENCE  ( VMASSO (1), FA (25))
ISN 00039             EQUIVALENCE  ( BETAV  (1), FA (26))
ISN 00040             EQUIVALENCE  ( DPD    (1), FA (27))
ISN 00041             EQUIVALENCE  ( DPDDP  (1), FA (28))
ISN 00042             EQUIVALENCE  ( ACCON  (1), FA (29))                                                     ##IA-FA#
                C
                *CEND                                                                                          DEVL END
                *CALL CMPDACC
                C
                C  DAIL    SURGE LINE DIAMETER.
                C  LNELV   SURGE LINE ELEVATION.
                C  THICK   TANK WALL THICKNESS.
                C  LNLEN   SURGE LINE LENGTH.
                C  TTANK   TANK WALL TEMPERATURE.
                C  TTANKO  TANK WALL TEMPERATURE, OLD TIME.
                C  THCND   NITROGEN THERMAL CONDUCTIVITY.
                C  HTCAP   TANK WALL SPECIFIC HEAT CAPACITY.
                C  RHOT    TANK WALL DENSITY.
                C  HTXR    HEAT TRANSFER FLAG.
                C  QTANK   HEAT TRANSFER TO NITROGEN FROM ALL SOURCES.
                C  VDM     DOME VOLUME (NITROGEN).
                C  VDMO    DOME VOLUME (NITROGEN), OLD TIME.
```

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FACOM OS1V/F4 FORTRAN IV (HE)  V04L18       MAIN  DATE 83.07.06  TIME 13.40.29                                  PAGE   49
                C  VLIQ    LIQUID VOLUME IN TANK AND SURGE LINE.
                C  VLIQO   LIQUID VOLUME IN TANK AND SURGE LINE, OLD TIME.
                C  RHON    NITROGEN DENSITY.
                C  RHONO   NITROGEN DENSITY, OLD TIME.
                C  TVAPO   NITROGEN TEMPERATURE, OLD TIME(TEMPG IS NEW TIME TEMERATURE).
                C  CVN1T   NITROGEN SPECIFIC HEAT CAPACITY.
                C  VMASSO  STEAM MASS, OLD TIME.
                C  BETAV   STEAM COEFFICIENT OF CUBICAL EXPANSION.
                C  DPD     VARIABLE USED IN SOLUTION MATRIX (RIGHT HAND SIDE).
                C  DPDDP   VARIABLE USED IN SOLUTION MATRIX (LEFT HAND SIDE).
                C  ACCON   ACCUMULATOR FLAG
                C          CONVERTTED TO ACTIVE VOLUME (1 BIT), UNUSED (39 BITS),
                C          CONVERTED TO ACTIVE VOLUME (1 BIT), UNUSED (39 BITS),
                C          DOWNSTREAM VOLUME INDEX (18 BITS).
                C                                                                                              DEVL END
                *CEND
                *CALL CMPDAT
                C
                C  DEFINITIONS COMMON TO ALL COMPONENTS
                C####  INTEGER NCMPS(1),CMPNUM(1),CMPNAM(1),CMPTYP(1),NVC(1),NJC(1)                            ########
                C                                                    ,NVC(1),NJC(1)                            PACKWORD
ISN 00043       C      REAL*8  NCMPS(1),CMPNUM(1)                                                              CHARACTR
ISN 00044       C      REAL*8                  CMPNAM(1),CMPTYP(1)                                             ##IA-FA#
ISN 00045       C      EQUIVALENCE (NCMPS(1),FA(1)),(CMPNUM(1),FA(1)),                                         ##IA-FA#
                C     * (CMPNAM(1),FA(2)),(CMPTYP(1),FA(3)),(NVC(1),FA(4)),                                    ##IA-FA#
                C     * (NJC(1),FA(5))
                C  DEFINITIONS FOR TIME DEPENDENT VOLUMES AND JUNCTIONS                                        ########
                C####  INTEGER NCTTRP(1),NCTALF(1),NCTDPV(1),NCTPC(1),NCTBLE(1)                                 CHARACTR
ISN 00046       C      REAL*8          NCTALF(1)                                                               INTEGER
ISN 00047       C      INTEGER                 NCTDPV(2,1)                                                     PACKWORD
ISN 00048       C      REAL*8  NCTTRP(1),                      NCTPC(1),NCTBLE(1)                              #REAL*8#
ISN 00049       C      REAL*8CMPTBL(1)                                                                         ##IA-FA#
ISN 00050       C      EQUIVALENCE (NCTTRP(1),FA(6)),(NCTALF(1),FA(7)),                                        ##IA-FA#
                C     * (NCTDPV(1),FA(8)),(NCTPC(1),FA(9)),(NCTBLE(1),FA(10)),
                C     * (CMPTBL(1),FA(11))                                                                     DEVL END
                *CEND
                *CALL CMPDATC
                C
                C  NCMPS   NUMBER OF COMPONENTS
                C  CMPNUM  INPUT FLAG (1 BIT), TYPE NUMBER OF COMPONENT
                C          (11 BITS), NUMBER OF WORDS IN THIS COMPONENT BLOCK
                C          (18 BITS), AND THE COMPONENT NUMBER (30 BITS).
                C  CMPNAM  COMPONENT NAME (ALPHANUMERIC)
                C  CMPTYP  COMPONENT TYPE (ALPHANUMERIC)
                C  NVC     INDEX TO FIRST VOLUME (18 BITS), FIRST VOLUME NUMBER (12
                C          BITS), NUMBER OF VOLUMES IN COMPONENT (12 BITS)
                C  NJC     INDEX TO FIRST JUNCTION (18 BITS), FIRST JUNCTION NUMBER (12
                C          BITS), NUMBER OF JUNCTIONS IN COMPONENT (12 BITS)
                C  NCTTRP  TRIP NUMBER (12 BITS), UNUSED (12 BITS), TRIP LOCATION
                C          RELATIVE TO TRIP BLOCK (18 BITS), TRIP LOCATION RELATIVE TO
                C          DYNAMIC BLOCK (18 BITS).
                C  NCTALF  ALPHANUMERIC PART OF VARIABLE REQUEST CODE.
                C  NCTDPV  NUMERIC PART OF VARIABLE REQUEST CODE.
                C  NCTPC   PACKED CODE FOR VARIABLE REQUEST, SCM-LCM FLAG (1 BIT),
                C          UNUSED  (11 BITS), 0 IF COMMON, NONZERO IS NUMBER OF
                C          CONTROL BLOCK (12 BITS), LOCATION OF OFFSET IN BLOCK
                C          (18 BITS), INDEX OF ITEM RELATIVE TO SCM OR LCM DYNAMIC
                C          BLOCK (18 BITS).
                C  NCTBLE  TABLE TYPE (15 BITS), NUMBER OF ITEMS/ENTRY (15 BITS),
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FACOM OSIV/F4 FORTRAN IV (HE)  V04L18        MAIN  DATE 83.07.06  TIME 13.40.29                                  PAGE   50
                C          TOTAL NUMBER OF ITEMS (15 BITS), CURRENT SUBSCRIPT (15 BITS)
                C  CMPTBL  TABLE ENTRIES
                *CEND                                                                                    DEVL END
                *CALL CMPDTV
                C  DEFINITIONS FOR VALVE COMPONENT
                C####  INTEGER  VLVNM(1)                                                                 ########
   ISN 00051           REAL*8   VLVNM(1)                                                                 CHARACTR
   ISN 00052           REAL*8PCV   (1), ALEAK (1), ATLAST(1)                                             #REAL*8#
   ISN 00053           EQUIVALENCE     ( VLVNM (1),FA( 6)), ( ATLAST(1),FA( 8)),
                      *                ( PCV   (1),FA( 9)), ( ALEAK (1),FA(10))
                C  DEFINITIONS FOR CHECK VALVE
                C####  INTEGER  VLVTYP(1)                                                                ########
   ISN 00054           REAL*8   VLVTYP(1)                                                                PACKWORD
   ISN 00055           EQUIVALENCE     ( VLVTYP(1),FA( 7) )                                              ##IA-FA#
                C  DEFINITIONS FOR TRIP VALVE
                C####  INTEGER  VLVTRP(1)                                                                ########
   ISN 00056           REAL*8   VLVTRP(1)                                                                PACKWORD
   ISN 00057           EQUIVALENCE     ( VLVTRP(1),FA( 7) )                                              ##IA-FA#
                C  DEFINITIONS FOR INERTIAL VALVE
                C####  INTEGER  VLVINR(1)                                                                ########
   ISN 00058           REAL*8   VLVINR(1)                                                                PACKWORD
   ISN 00059           EQUIVALENCE     ( VLVINR(1),FA( 7) )                                              ##IA-FA#
   ISN 00060           REAL*8THETA (1), THETAO(1), MINTHT(1), MAXTHT(1), MOMENT(1),                      #REAL*8#
                      *       OMEGA (1), OMEGAO(1), LNGVLV(1), RDSVLV(1), VLFMAS(1)
   ISN 00061           EQUIVALENCE     ( THETA (1),FA(11)), ( THETAO(1),FA(12)),
                      *                ( MINTHT(1),FA(13)), ( MAXTHT(1),FA(14)),
                      *                ( MOMENT(1),FA(15)), ( OMEGA (1),FA(16)),
                      *                ( OMEGAO(1),FA(17)), ( LNGVLV(1),FA(18)),
                      *                ( RDSVLV(1),FA(19)), ( VLFMAS(1),FA(20))
                C  DEFINITIONS FOR MOTOR VALVE
                C####  INTEGER  OPNTRP(1), CLSTRP(1), TBLNUM(1), NCVTBL(1)                               ########
   ISN 00062           REAL*8   OPNTRP(1), CLSTRP(1), TBLNUM(1), NCVTBL(1)                               PACKWORD
   ISN 00063           REAL*8 VLVSLP(1), VLSTM(1), VLSTMO(1), CVTBL(1)                                   #REAL*8#
   ISN 00064           EQUIVALENCE     ( OPNTRP(1),FA( 7)), ( CLSTRP(1),FA( 9)),                         ##IA-FA#
                      *                ( TBLNUM(1),FA(10)),                                              ##IA-FA#
                      *                ( VLVSLP (1),FA(11)), ( VLSTM  (1),FA(12)),
                      *                ( VLSTMO (1),FA(13)), ( NCVTBL (1),FA(14)),                       ##IA-FA#
                      *                ( CVTBL  (1),FA(15))
                *CEND                                                                                    DEVL END
                *CALL CMPDTVC
                C
                C  DEFINITIONS TO ALL VALVES
                C
                C  VLVNM   VALVE NAME.
                C  ATLAST  NORMALIZED FULL OPEN VALVE AREA.
                C
                C  DEFINITIONS TO CHECK VALVES
                C
                C  VLVTYP  VALVE FLAGS
                C  PCV     BACK PRESSURE TO CLOSE VALVE.
                C  ALEAK   NORMALIZED AREA OF VALVE LEAKAGE.
                C
                C  DEFINITIONS TO TRIP VALVES
                C
                C  VLVTRP  TRIP NUMBER.
                C
                C  DEFINITIONS TO INERTIAL VALVE
                C
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FACOM OSIV/F4 FORTRAN IV (HE)  V04L18        MAIN  DATE 83.07.06  TIME 13.40.29                                  PAGE   51
                C  THETA   VALVE DISK ANGULAR POSITION.
                C  THETAO  VALVE DISK ANGULAR POSITION, OLD TIME.
                C  MINTHT  MINIMUM VALVE DISK ANGULAR POSITION.
                C  MAXTHT  MAXIMUM VALVE DISK ANGULAR POSITION.
                C  MOMENT  MASS MOMENT OF INERTIA OF VALVE DISK.
                C  OMEGA   VALVE DISK ANGULAR VELOCITY.
                C  OMEGAO  VALVE DISK ANGULAR VELOCITY, OLD TIME.
                C  LNGVLV  LENGTH OF VALVE DISK MOMENT ARM.
                C  RDSVLV  VALVE DISK RADIUS.
                C  THRTVL  NOT USED.
                C
                C  DEFINITIONS TO MOTOR VALVE
                C
                C  OPNTRP  OPEN TRIP NUMBER.
                C  CLSTRP  CLOSE TRIP NUMBER.
                C  VLVSLP  RATE OF CHANGE OF NORMALIZED STEM POSITION.
                C  VLSTM   NORMALIZED STEM POSITION.
                C  VLSTMO  NORMALIZED STEM POSITION, OLD TIME.
                C  VLVTBL  TABLE NUMBER OF "NORMAREA" TABLE.
                C  NCVTBL  VARIABLE USED FOR TABLE INTERPOLATION AS FOLLOWS
                C          UNUSED (15 BITS), NUMBER OF ITEMS/ENTRY (15 BITS),
                C          TOTAL NUMBER OF ITEMS (15 BITS), CURRENT SUBSCRIPT
                C          (15 BITS).
                C  CVTBL   TABLE ENTERIES (SETS OF THREE STARTING WITH
                C          NORMALIZED STEM POSITION, FJUNF, FJUNR).
                C
                C  DEFINITIONS TO SERVO VALVE
                C
                C  OPNTRP  CONTROL VARIABLE NUMBER.
                C  CLSTRP  USED FOR CONTROL VARIABLE INFORMATION.
                C  VLSTM   NORMALIZED STEM POSITION, CONTROLLED BY CONTROL
                C          VARIABLE.
                C  VLVTBL  TABLE NUMBER OF "NORMAREA" TABLE.
                C
                *CEND                                                                                    DEVL END
                *CALL CONVARC
                C
                C  CONTROL VARIABLE BLOCK.
                C####  INTEGER CNVNUM(1),CNVPNM(1),CNVTYP(1),CNVNAM(1),CNVALF(1),                        ########
                C#####* CNVINT(1),CNVPCK(1),CNVCTL(1),CNVGEN(1),CNVTRP(1)                                 ########
   ISN 00065           INTEGER                                                                           INTEGER
                      * CNVINT(2,1)                                                                      INTEGER
   ISN 00066           REAL*8                        CNVTYP(1),CNVNAM(1),CNVALF(1)                       CHARACTR
   ISN 00067           REAL*8  CNVNUM(1),CNVPNM(1),                                                      PACKWORD
                      *            CNVPCK(1),CNVCTL(1),CNVGEN(1),CNVTRP(1)                             PACKWORD
   ISN 00068           REAL*8CNVARN(1),CNVARO(1),CNVSCL(1),CNVMIN(1),CNVMAX(1),                          #REAL*8#
                      * CNVSAN(1),CNVOLD(1)
   ISN 00069           EQUIVALENCE (CNVNUM(1),FA(1)),(CNVPNM(1),FA(2)),                                  ##IA-FA#
                      * (CNVTYP(1),FA(3)),(CNVNAM(1),FA(4)),(CNVMIN(1),FA(5)),                          ##IA-FA#
                      * (CNVMAX(1),FA(6)),(CNVARN(1),FA(7)),(CNVARO(1),FA(8)),
                      * (CNVSCL(1),FA(9)),(CNVALF(1),FA(10)),(CNVTRP(1),FA(10)),                        ##IA-FA#
                      * (CNVINT(1),FA(11)),(CNVPCK(1),FA(12)),(CNVCTL(1),FA(13)),                       ##IA-FA#
                      * (CNVSAN(1),FA(14)),(CNVOLD(1),FA(14)),(CNVGEN(1),FA(14))                        ##IA-FA#
                *CEND                                                                                    DEVL END
                *CALL CONVARX
                C
                C  CNVNUM  NUMBER OF CONTROL COMPONENTS.
                C  CNVPNM  INITIALIZATION FLAG (1 BIT), NONLINEAR FLAG (1 BIT),
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FACOM OS4V/F4 FORTRAN IV (HE)  V04L18       MAIN  DATE 83.07.06  TIME 13.40.29                                    PAGE   52
                C           MAXIMUM LIMIT FLAG (1 BIT), AT MAXIMUM (1 BIT), MINIMUM
                C           LIMIT FLAG (1 BIT), AT MINIMUM (1 BIT), CONTROL VARIABLE
                C           POSITION (12 BITS), TYPE OF STANDARD FUNCTION (6 BITS),
                C           NUMBER OF TERMS OR FACTORS (6 BITS), TYPE NUMBER (6 BITS),
                C           NUMBER OF WORDS IN COMPONENT (12 BITS), COMPONENT NUMBER
                C           (12 BITS).
                C  CNVTYP   CONTROL COMPONENT TYPE (ALPHANUMERIC).
                C  CNVNAM   CONTROL COMPONENT ALPHANUMERIC NAME.
                C  CNVMIN   MINIMUM VALUE PERMITTED COMPONENT.
                C  CNVMAX   MAXIMUM VALUE PERMITTED COMPONENT.
                C  CNVARN   NEW VALUE OF CONTROL VARIABLE.
                C  CNVARO   OLD VALUE OF CONTROL VARIABLE.
                C  CNVSCL   SCALE FACTOR.
                C  CNVALF   ALPHANUMERIC PART OF VARIABLE REQUEST CODE.
                C  CNVINT   INTEGER PART OF VARIABLE REQUEST CODE.
                C  CNVPCK   PACKED CODE FROM VARIABLE REQUEST CODE, SCM-LCM FLAG (1
                C           BIT), UNUSED (11 BITS), 0 IF COMMON, NONZERO IS NUMBER OF
                C           CONTROL BLOCK (12 BITS), OFFSET IN BLOCK (18 BITS),
                C           LOCATION OF ITEM RELATIVE TO SCM OR LCM DYNAMIC BLOCK
                C           (18 BITS).
                C  CNVCTL   ZERO IF NOT A CONTROL VARIABLE, IF A CONTROL VARIABLE, UNUSED
                C           (30 BITS), CONTROL VARIABLE POSITION NUMBER (12 BITS),
                C           MATRIX POSITION NUMBER (18 BITS).
                C  CNVSAN   "A" FACTOR IN SUM OR PID CONTROL COMPONENTS.
                C  CNVOLD   OLD VALUES NEEDED IN DIFFEREN OR PID COMPONENT BLOCKS.
                C  CNVGEN   UNUSED (18 BITS), INDEX FOR GENERAL TABLE (18 BITS),
                C           ACTUAL TABLE NUMBER (12 BITS), INPUT TABLE NUMBER (12 BITS).
                C  CNVTRP   TRIP NUMBER (12 BITS), UNUSED (12 BITS), TRIP LOCATION
                C           RELATIVE TO TRIP BLOCK (18 BITS), TRIP LOCATION RELATIVE
                C           TO DYNAMIC BLOCK (18 BITS).
                *CEND                                                                  DEVL END
                *CALL FAST
                C                                                                      LCM VERS
      ISN 00070         COMMON /FAST/ FA(100)                                          ION;DEFI
      ISN 00071         INTEGER IA(2,100)                                              NE SCOPE
      ISN 00072         EQUIVALENCE (FA(1),IA(1))                                      O########
      ISN 00073         REAL*8 LFA(100)                                                #REAL*8#
      ISN 00074         INTEGER LIA(2,100)
      ISN 00075         EQUIVALENCE (LFA(1),LIA(1),FA(1))
                *CEND                                                                  DEVL END
                *CALL FASTC
                C
                C  ARRAYS DEFINE DYNAMIC POOL AREA.  FA AND IA ARE EQUIVALENT FLOATING
                C  AND INTEGER AREAS IN SCM.  LFA AND LIA ARE EQUIVALENT FLOATING
                C  AND INTEGER AREAS IN LCM.
                *CEND                                                                  DEVL END
                *CALL GENRL
                C
                C####  COMMON /GENRL/ CTITLE(10),FAIL,IROUTE,NCASE,PTITLE(7),          ########
      ISN 00076         COMMON /GENRL/ CTITLE(12),FAIL,IROUTE,NCASE,PTITLE(9),         CHARACTR
                     * UNITI,UNITO,SAFE3
                C####  INTEGER CTITLE,PTITLE                                          ########
      ISN 00077         REAL*8  CTITLE,PTITLE                                          CHARACTR
      ISN 00078         REAL*8                IROUTE                                   PACKWORD
      ISN 00079         LOGICAL FAIL,UNITI,UNITO
                *CEND                                                                  DEVL END
                *CALL GENRLC
                C

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                C  CTITLE   CONTAINS TITLE CARD OF CASE (8 WORDS), BLANK WORD, AND DATE
                C           (1 WORD).
                C  FAIL     SET TO TRUE IF ERROR ENCOUNTERED
                C  IROUTE   INDICATES TYPE OF PROBLEM, CONTROL BETWEEN RELAP5 AND INPUT
                C  NCASE    CASE NUMBER, NEGATIVE IF LAST CASE OF A SERIES
                C  PTITLE   CONTAINS PROGRAM VERSION IDENTIFICATION AND TITLE.
                C  UNITI    UNITS FOR INPUT, SI IF TRUE, BRITISH IF FALSE.
                C  UNITO    UNITS FOR OUTPUT, SI IF TRUE, BRITISH IF FALSE.
                C  SAFE3    SAME PURPOSE AS SAFE1.
                *CEND                                                                  DEVL END
                *CALL GENTBLL
                C
                C  GENERAL TABLE STORAGE (FOR LCM)
                C####  INTEGER NGTBLS(1),GTBPTR(1),GTTRP(1),GTINFO(1)                  ########
      ISN 00080         INTEGER NGTBLS(2,1)                                            INTEGER
      ISN 00081         REAL*8            GTBPTR(1),GTTRP(1),GTINFO(1)                 PACKWORD
      ISN 00082         REAL*8GTARG(1),GTVAL(1),GTBL(1)                                #REAL*8#
      ISN 00083         EQUIVALENCE (NGTBLS(1),LFA(1)),(GTBPTR(1),LFA(1)),             #LIA-LFA
                     * (GTTRP(1),LFA(1)),(GTARG(1),LFA(2)),(GTVAL(1),LFA(3)),          #LIA-LFA
                     * (GTINFO(1),LFA(4)),(GTBL(1),LFA(5))                            #LIA-LFA
                *CEND                                                                  DEVL END
                *CALL GENTBLX
                C
                C  NGTBLS  NUMBER OF GENERAL TABLES.
                C  GTBPTR  TABLE ERROR FLAG (1 BIT), NOT USED (29 BITS),
                C          TABLE NUMBER (12 BITS), TABLE OFFSET (18 BITS).
                C  GTTRP   TRIP NUMBER (12 BITS), UNUSED (12 BITS), TRIP LOCATION
                C          RELATIVE TO TRIP BLOCK (18 BITS), TRIP LOCATION RELATIVE TO
                C          DYNAMIC BLOCK (18 BITS).
                C  GTARG   ARGUMENT FOR LAST TABLE LOOKUP.
                C  GTVAL   RESULT FROM LAST TABLE LOOKUP.
                C  GTINFO  TABLE TYPE (15 BITS), NUMBER OF ITEMS/ENTRY (15 BITS),
                C          TOTAL NUMBER OF ITEMS (15 BITS), CURRENT SUBSCRIPT (15 BITS).
                C  GTBL    TABLE VALUES.
                *CEND                                                                  DEVL END
                *CALL HTSRCM
                C
                C  HEAT STRUCTURES ARRAYS BLOCK
                C    FOR DIRECTOR ARRAY
                C####  INTEGER HHTSTR(1),IHTPTR(1)                                    ########
      ISN 00084         INTEGER HHTSTR(2,1)                                            INTEGER
      ISN 00085         REAL*8            IHTPTR(1)                                    PACKWORD
      ISN 00086         EQUIVALENCE (HHTSTR(1),FA(1)),(IHTPTR(1),FA(2))                ##IA-FA#
                C    FOR STORAGE ARRAY
                C####  INTEGER INXFT(1),INXIT(1),INXGOM(1),INXSRC(1),INXBC(1),IHCOLS(1),########
                C##### HIBNDO(1),HIBNDN(1),HTIHCO(1),HTIHCN(1)                        ########
      ISN 00087         INTEGER                                          IHCOLS(2,1) INTEGER
      ISN 00088         REAL*8  INXFT(1),INXIT(1),INXGOM(1),INXSRC(1),INXBC(1),        PACKWORD
                     * HIBNDO(1),HIBNDN(1),HTIHCO(1),HTIHCN(1)                         PACKWORD
      ISN 00089         REAL*8HTFCTR(1),HTSRFO(1),HTSRFN(1),HTRNRO(1),HTRNRN(1),       #REAL*8#
                     * HTRNSO(1),HTRNSN(1),HTFTRO(1),HTFTRN(1),HTPOWO(1),
                     * HTPOWN(1),HTTOTS(1),HTIMED(1),HTDT(1),HTHOMO(1),HTHOMN(1),
                     * HTCHEO(1),HTDHEN(1),HTCHNO(1),HTCHNN(1),HTCHFO(1),HTCHFN(1),
                     * HTVATP(1),HTVADM(1),HTDTMO(1),HTDTMN(1),HTTMP(1)
      ISN 00090         EQUIVALENCE (INXFT(1),FA(1)),(INXIT(1),FA(2)),(INXGOM(1),FA(3)), ##IA-FA#
                     * (INXSRC(1),FA(4)),(INXBC(1),FA(5)),(IHCOLS(1),FA(6))           ##IA-FA#
      ISN 00091         EQUIVALENCE (HTFCTR(1),FA(7)),(HTSRFO(1),FA(8)),
                     * (HTSRFN(1),FA(9)),(HTRNRO(1),FA(10)),(HTRNRN(1),FA(11)),
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                     * (HTRNSO(1),FA(12)),(HTRNSN(1),FA(13)),(HTBNDO(1),FA(14)),          ##IA-FA#
                     * (HTBNDN(1),FA(15)),(HTFTRO(1),FA(16)),(HTFTRN(1),FA(17)),          ##IA-FA#
                     * (HTPOWO(1),FA(18)),(HTPOWN(1),FA(19)),(HTTOTS(1),FA(20)),
                     * (HTIMEO(1),FA(21)),(HTDT(1),FA(22)),(HTINCO(1),FA(23)),            ##IA-FA#
                     * (HTINCN(1),FA(24)),(HTHDMO(1),FA(25)),(HTHDMN(1),FA(26)),          ##IA-FA#
                     * (HTDHEO(1),FA(27)),(HTDHEN(1),FA(28)),(HTCHNO(1),FA(29)),
                     * (HTCHNN(1),FA(30)),(HTCHFO(1),FA(31)),(HTCHFN(1),FA(32)),
                     * (HTVATP(1),FA(33)),(HTVADM(1),FA(34)),(HTDTMO(1),FA(35)),
                     * (HTDTMN(1),FA(36)),(HTTMP(1),FA(1))
                    C####  INTEGER HTCMP(1)                                              ########
   ISN 00092              REAL*8  HTCMP(1)                                              PACKWORD
   ISN 00093              REAL*8AREAD(1),AREAN(1),HTSRC(1),HTAVWT(1),                   #REAL*8#
                        * HTSRWT(1),HTRVWT(1),HTLVWT(1)
   ISN 00094              EQUIVALENCE (AREAD(1),FA(1)),(AREAN(1),FA(2)),(HTSRC(1),FA(3)),
                        * (HTAVWT(1),FA(4)),(HTCMP(1),FA(5)),(HTSRWT(1),FA(6)),          ##IA-FA#
                        * (HTRVWT(1),FA(7)),(HTLVWT(1),FA(8))
                    *CEND                                                             DEVL END
                    *CALL HTSRCMC
                    C
                    C  NHTSTR  NUMBER OF HEAT STRUCTURES.
                    C  IHTPTR  PACKED WORD FOR EACH HEAT STRUCTURE CONTAINING HEAT
                    C          STRUCTURE NUMBER (30 BITS), STEADY STATE FLAG (1 BIT),
                    C          INPUT ERROR FLAG (1 BIT), INITIALIZATION FLAG (1BIT), UNUSED
                    C          (9 BITS), OFFSET FOR  FOR THIS HEAT STRUCTURE (18 BITS).
                    C  THE FOLLOWING ARE FOR EACH STRUCTURE.
                    C  INXFT   UNUSED (18 BITS), LEFT GENERAL TABLE NUMBER OR SUBROUTINE
                    C          NUMBER (12 BITS), LEFT REDUCED BOUNDARY TYPE (12 BITS),
                    C          INDEX TO TEMPERATURES AT END OF TIME STEP (18 BITS).
                    C  INXIT   UNUSED (18 BITS), RIGHT GENERAL TABLE NUMBER OR SUBROUTINE
                    C          NUMBER (12 BITS), RIGHT REDUCED BOUNDARY TYPE (12 BITS),
                    C          INDEX TO TEMPERATURES AT BEGINNING OF TIME STEP (18 BITS).
                    C  INXGOM  GEOMETRY REFERRAL FLAG (1 BIT), UNUSED (23 BITS), REFERRAL
                    C          NUMBER (18 BITS), INDEX (18 BITS).
                    C  INXSRC  GENERAL TABLE POSITION NUMBER (18 BITS), GENERAL TABLE
                    C          NUMBER (12 BITS), SOURCE TYPE (12 BITS), GEOMETRY TYPE
                    C          (18 BITS).
                    C  INXBC   RIGHT INPUT BOUNDARY TYPE (15 BITS), LEFT INPUT BOUNDARY TYPE
                    C          (15 BITS), INDEX TO BOUNDARY CONDITIONS (30 BITS).
                    C  IHCOLS  NUMBER OF MESH POINTS.
                    C  HTFCTR  SOURCE MULTIPLIER
                    C  AREAD   SURFACE WEIGHT AT LEFT BOUNDARY.
                    C  AREAN   SURFACE WEIGHT AT RIGHT BOUNDARY.
                    C  HTSRFO AREA AT LEFT BOUNDARY.
                    C  HTSRFN AREA AT RIGHT BOUNDARY.
                    C  HTRNRO HEAT TRANSFER RATE AT LEFT BOUNDARY (NEW).
                    C  HTRNRN HEAT TRANSFER RATE AT RIGHT BOUNDARY (NEW).
                    C  HTRNSO HEAT TRANSFER RATE AT LEFT BOUNDARY (OLD).
                    C  HTRNSN HEAT TRANSFER RATE AT RIGHT BOUNDARY (OLD).
                    C  HTBNDO LEFT BOUNDARY VOLUME.  BOUNDARY VOLUME INDEX (18 BITS),
                    C         BOUNDARY VOLUME NUMBER (12 BITS), BOUNDARY VOLUME CODE
                    C         AS INPUT (30 BITS).
                    C  HTBNDN RIGHT BOUNDARY VOLUME.  SAME FORMAT AS FOR HTBNDO.
                    C  HTFTRO LEFT DIRECT SOURCE FACTOR.
                    C  HTFTRN RIGHT DIRECT SOURCE FACTOR.
                    C  HTPOWO OLD POWER VALUE.
                    C  HTPOWN NEW POWER VALUE.
                    C  HTTOTS INTEGRAL OF THE SOURCE DISTRIBUTION OVER SPACE.
                    C  HTIMEO TIME AT BEGINNING OF ADVANCEMENT.


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                    C  HTDT    TIME INCREMENT.
                    C  HTINCO  LEFT SIDE INDICATIORS.  UNUSED (42 BITS), HEAT TRANSFER MODE
                    C          (6 BITS), CHF TYPE (6 BITS), FILM BOILING TYPE (6 BITS).
                    C  HTINCN RIGHT SIDE INDICATORS.  SAME FORMAT AS HTINCO.
                    C  HTHDMO LEFT SIDE HYDRAULIC DIAMETER.
                    C  HTHDMN RIGHT SIDE HYDRAULIC DIAMETER.
                    C  HTDHEO LEFT SIDE HEATED EQUIVALENT DIAMETER.
                    C  HTDHEN RIGHT SIDE HEATED EQUIVALENT DIAMETER.
                    C  HTCHNO LEFT SIDE CHANNEL LENGTH.
                    C  HTCHNN RIGHT SIDE CHANNEL LENGTH.
                    C  HTCHFO LEFT SIDE CRITICAL HEAT FLUX.
                    C  HTCHFN RIGHT SIDE CRITICAL HEAT FLUX.
                    C  HTDTMO  LEFT SIDE OLD (TWALL - TWATER).
                    C  HTDTMN  RIGHT SIDE OLD (TWALL - TWATER).
                    C  HTTMP   TEMPERATURE IN HEAT STRUCTURE.
                    *CEND                                                             DEVL END
                    *CALL HYSOL
                    C
                    C  HYDRODYNAMIC SOLUTION ARRAY BLOCK
                    C####  INTEGER IP(1),IPR(1),IRNR(1),IRN(1)                        ########
   ISN 00095              INTEGER IP(2,1),     IRNR(2,1)                             INTEGER
   ISN 00096              INTEGER                    IRN(2,1)                        INTEGER
   ISN 00097              REAL*8         IPR(1)                                     PACKWORD
   ISN 00098              REAL*8CDEFP(1),CDEFX(1),W(1),SOURCP(1),SOURCE(1),SOURCM(1),  #REAL*8#
                        * SOURCQ(1),VFDP(1),VGDP(1),PCEF(1),PCEG(1),PCMF(1),PCMG(1)
                        *  ,PCMA(1),SOURCA(1)
                    C####  EQUIVALENCE (IA(1),IP(1),IPR(1),IRNR(1),IRN(1)),           ########
   ISN 00099              EQUIVALENCE (IA(1),IP(1),       IRNR(1),IRN(1))            INTEGER
   ISN 00100              EQUIVALENCE (FA(1),      IPR(1)                ),          PACKWORD
                        * (FA(1),CDEFP(1),CDEFX(1),SOURCP(1),SOURCE(1),W(1),VFDP(1),
                        *  PCEF(1)),
                        * (FA(2),SOURCM(1),VGDP(1),PCEG(1)),(FA(3),SOURCQ(1),PCMF(1)),
                        *  ( FA(4), PCMG(1), SOURCA(1)),
                        *  ( FA(5), PCMA(1))
                    *CEND                                                             DEVL END
                    *CALL HYSOLC
                    C
                    C  IP      CONTROL ARRAY FOR SPARSE MATRIX INVERSION ROUTINE
                    C  IPR     ARRAY CONTAINING POSITION OF FIRST NONZERO OF EACH ROW
                    C  IRNR    ARRAY HOLDING POSITION OF NONZEROS FOR SOLUTION MATRIX
                    C  IRN     SIMILAR TO IRNR FOR PREVIOUSLY INVERTED MATRIX
                    C  SOURCP  RIGHT HAND SIDE
                    C  CDEFP   ARRAY HOLDING NONZERO VALUES OF MATRIX
                    C  CDEFX   SAME AS CDEFP, INVOLVED IN REPEATED SOLUTIONS USING SAME
                    C.         SOLUTION SCALING AND ORDER
                    C  PV      SOLUTION VECTOR (DELTA PRESSURES)
                    C  W       SCRATCH ARRAY USED IN LOADING AND MATRIX MULTIPLY ROUTINES
                    *CEND                                                             DEVL END
                    *CALL INVTBL
                    C####  INTEGER INVCNT(1),INVJUN(1)                                ########
   ISN 00101              INTEGER INVCNT(2,1)                                        INTEGER
   ISN 00102              REAL*8          INVJUN(1)                                  PACKWORD
   ISN 00103             REAL*8XNVJUN(1)                                             #REAL*8#
   ISN 00104              EQUIVALENCE (INVCNT(1),FA(1)),(INVJUN(1),FA(1))            ##IA-FA#
   ISN 00105             EQUIVALENCE (INVJUN(1), XNVJUN(1))
                    *CEND                                                             DEVL END
                    *CALL INVTBLC
                    C  INVCNTNUMBERR OF INLET OR OUTLET JUNCTIONS FOR VOLUME
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                C  INVJUN  JUNCTION NUMBER (INTERNAL NUMBER,-NOT INPUT NUMBER)
                *CEND                                                                                  DEVL END
                *CALL JUNDAT
                C
                C  JUNCTION BLOCK
   ISN 00106            REAL*8AJUN(1),FIJ(1),FORMFJ(1),FORMGJ(1),FIJO(1),                              #REAL*8#
                       * RHOFJ(1),RHOGJ(1),UFJ(1),UGJ(1),VELFJ(1),
                       * VELGJ (1), VELJ  (1), VELFJO(1), VELGJO(1), VELJO (1), VOIDFJ(1),
                       * VOIDGJ(1), FJUNF (1), FJUNR (1), DIAMJ (1), ATHROT(1), VOIDD (1),
                       *  VOIDT(1),ARAT(2),FAAJ(1),MFLOWJ(1),CCAJ(1)
                C####  INTEGER NJUNS(1),NJSKP(1),IJ1(1),IJ2(1),IMREG(1),JC(2),JUNNO(1), ########
                C#####* JUNFTL(1)                                                                      ########
   ISN 00107            INTEGER NJUNS(2,1)                                                             INTEGER
   ISN 00108            INTEGER          NJSKP(2,1),                                 JUNNO(2,1)INTEGER
   ISN 00109            REAL*8                    IJ$(1),IJ2(1),IMREG(1),JC(2),                       PACKWORD
                       * JUNFTL(1)                                                                     PACKWORD
                C
   ISN 00110             EQUIVALENCE     ( NJUN$ (1),FA( 1) )                                        #*IA-FA#
   ISN 00111             EQUIVALENCE     ( NJSKP (1),FA( 2) )                                        #*IA-FA#
   ISN 00112             EQUIVALENCE     ( IJ1   (1),FA( 3) )                                        #*IA-FA#
   ISN 00113             EQUIVALENCE     ( IJ2   (1),FA( 4) )                                        #*IA-FA#
   ISN 00114             EQUIVALENCE     ( AJUN  (1),FA( 5) )
   ISN 00115             EQUIVALENCE     ( FIJ   (1),FA( 6) )
   ISN 00116             EQUIVALENCE     ( FJUNF (1),FA( 7) )
   ISN 00117             EQUIVALENCE     ( FJUNR (1),FA( 8) )
   ISN 00118             EQUIVALENCE     ( FORMFJ(1),FA( 9) )
   ISN 00119             EQUIVALENCE     ( FORMGJ(1),FA(10) )
   ISN 00120            EQUIVALENCE (IMREG(1),FA(11))                                                #*IA-FA#
   ISN 00121            EQUIVALENCE (FIJO(1),FA(12))
   ISN 00122             EQUIVALENCE     ( RHOFJ (1),FA(13) )
   ISN 00123             EQUIVALENCE     ( RHOGJ (1),FA(14) )
   ISN 00124             EQUIVALENCE     ( UFJ   (1),FA(15) )
   ISN 00125             EQUIVALENCE     ( UGJ   (1),FA(16) )
   ISN 00126             EQUIVALENCE     ( VELFJ (1),FA(17) )
   ISN 00127             EQUIVALENCE     ( VELGJ (1),FA(18) )
   ISN 00128             EQUIVALENCE     ( VELJ  (1),FA(19) )
   ISN 00129             EQUIVALENCE     ( VELFJO(1),FA(20) )
   ISN 00130             EQUIVALENCE     ( VELGJO(1),FA(21) )
   ISN 00131             EQUIVALENCE     ( VELJO (1),FA(22) )
   ISN 00132             EQUIVALENCE     ( VOIDFJ(1),FA(23) )
   ISN 00133             EQUIVALENCE     ( VOIDGJ(1),FA(24) )
   ISN 00134             EQUIVALENCE     ( DIAMJ (1),FA(25) )
   ISN 00135             EQUIVALENCE     ( JC    (1),FA(26) )                                        #*IA-FA#
                C        JC USES TWO WORDS.
   ISN 00136             EQUIVALENCE     ( JUNNO (1),FA(28) )                                        #*IA-FA#
   ISN 00137             EQUIVALENCE     ( ATHROT(1),FA(29) )
   ISN 00138             EQUIVALENCE     ( VOIDD (1),FA(30) )
   ISN 00139             EQUIVALENCE     ( VOIDT (1),FA(31) )
   ISN 00140             EQUIVALENCE     ( ARAT  (1),FA(32) )
                C  ARAT USES TWO WORDS
   ISN 00141             EQUIVALENCE     ( FAAJ  (1),FA(34) )
   ISN 00142            EQUIVALENCE (MFLOWJ(1),FA(35))
   ISN 00143             EQUIVALENCE     ( CCAJ  (1), FA(36) )
   ISN 00144            EQUIVALENCE (JUNFTL(1),FA(37))                                               #*IA-FA#
                *CEND                                                                                  DEVL END
                *CALL JUNDATC
                C
                C  AJUN    AREA OF JUNCTION


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                C  ATHROT  RATIO OF ORIFICE AREA TO JUNCTION AREA.
                C  FIJ     INTERPHASE FRICTION
                C  FORMFJ  FORM LOSS TERM  LIQUID
                C  FORMGJ  FORM LOSS TERM VAPOR
                C  IMREG   SUBCOOLED DISCHARGE COEFFICIENT (15 BITS),TWO-PHASE DISCHARGE
                C          COEFFICIENT (15 BITS),FLOW REGIME INDEX (30 BITS).
                C  FIJO    OLD TIME VALUE OF INTERPHASE FRICTION.
                C  RHOFJ   JUNCTION DENSITY  LIQUID
                C  RHOGJ   JUNCTION DENSITY  VAPOR
                C  UFJ     JUNCTION SPECIFIC INTERNAL ENERGY  LIQUID
                C  UGJ     JUNCTION SPECIFIC INTERNAL ENERGY  VAPOR
                C  VELFJ   VELOCITY  LIQUID
                C  VELGJ   VELOCITY  VAPOR
                C  VELJ    JUNCTION VELOCITY  INTERFACE TRACKING
                C  VELFJO  VELOCITY  LIQUID PREVIOUS TIME STEP
                C  VELGJO  VELOCITY  VAPOR  PREVIOUS TIME STEP
                C  VELJO   JUNCTION VELOCITY  INTERFACE TRACKING PREVIOUS TIME STEP
                C  VOIDFJ  JUNCTION VOID-FRACTION  LIQUID
                C  VOIDGJ  JUNCTION VOID-FRACTION  VAPOR
                C  IJ1     FROM VOLUME INFORMATION.  TIME DEPENDENT FLAG (1 BIT),
                C          INDEX TO VOLUME (17 BITS), VOLUME NUMBER (12 BITS),
                C          INPUT CODE (30 BITS).
                C  IJ2     TO VOLUME INFORMATION.  CHOKING FLAG (1 BIT), REST IS THE
                C          SAME AS IJ1.
                C  JC(1)   FLAG FOR REVERSED "FROM" VOLUME CONNECTION (1 BIT),
                C          CHOKING TEST FLAG FOR JUCTION CONNECTED TO ACCUMULATOR
                C          VOLUME (1 BIT), ABRUPT AREA CHANGE FLAG (1 BIT),
                C          TWO VELOCITY, DRIFT FLUX, ONE VELOCITY FLAGS (2 BITS),
                C          PSEUDO-STEADY STATE FLAG (1 BIT), INDEXES FOR "FROM"
                C          CONNECTION SET IN TSETSL FOR PRESEQ (3 18 BIT INDEXES).
                C  JC(2)   FLAG FOR REVERSED "TO" VOLUME CONNECTION (1 BIT), FLAG FOR
                C          NO CHOKING CALCULATION (1 BIT), INPUT FLAG (1 BIT),
                C          SEPARATOR FLAG  (1 BIT), OLD TIME CHOKING FLAG (1 BIT),
                C          STRATIFIED FLOW FLAG (1 BIT), INDEXES FOR "TO"
                C          CONNECTION SET IN TSETSL FOR PRESEQ (3 18 BIT INDEXES).
                C  JUNFTL  FROM POINTER IN OUTPUT FORM WITHOUT SIGN (30 BITS), SAME FOR
                C          TO POINTER (30 BITS).
                C  MFLOWJ  MASS FLOW RATE.
                C  JUNNO   JUNCTION NUMBER FOR OUTPUT EDITING.
                C  NJSKP   JUNCTION SKIP FACTOR
                C  NJUN$   NUMBER OF JUNCTIONS.
                C  FJUNF   FORM-LOSS COEFFICIENT FOR AREA CHANGES, FOWARD
                C  FJUNR   FORM-LOSS COEFFICIENT FOR AREA CHANGES, REVERSE
                C  DIAMJ   DIAMETER OF JUNCTION
                C  VOIDD   VOID FRACTION DOWNSTREAM OF AN ABRUPT AREA-CHANGE  VAPOR
                C  VOIDT   VOID FRACTION AT THE THROAT OF AN ABRUPT AREA-CHANGE  VAPOR
                *CEND                                                                                  DEVL END
                *CALL MIEDTC
                C
                C  EQUIVALENCE BLOCKS FOR MINOR EDITS.
                C####  INTEGER NMIET(1),MIETAB(1)                                                      ########
   ISN 00145            INTEGER NMIET(2,1)                                                             INTEGER
   ISN 00146            REAL*8           MIETAB(1)                                                     PACKWORD
   ISN 00147            EQUIVALENCE (NMIET(1),FA(1)),(MIETAB(1),FA(2))                                #*IA-FA#
                C####  INTEGER MIPCK(1),MICODE(1),MILABL(1)                                            ########
   ISN 00148            REAL*8  MIPCK(1),MICODE(1)                                                     PACKWORD
   ISN 00149            REAL*8                   MILABL(1)                                             CHARACTR
   ISN 00150            REAL*8MICONV(1),MIHOLD(1)                                                      #REAL*8#
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 ISN 00151           EQUIVALENCE (MIPCK(1),LFA(1)),(MICODE(1),LFA(2)),                                  #LIA-LFA
                    * (MICONV(1),LFA(3)),(MIHOLD(1),LFA(1)),(MILABL(1),LFA(1))                          #LIA-LFA
                    *CEND                                                                               DEVL END
                    *CALL MIEDTCL
                    C  NMIET  NUMBER OF MINOR EDIT REQUESTS.
                    C  MIETAB TWO WORD SETS (ALPHANUMERIC AND INTEGER) OF MINOR EDIT
                    C         REQUESTS.
                    C  MIPCK  UNUSED (4 BITS), INCREMENT, 1 IF NO CONVERSION FACTORS, 2 IF
                    C         CONVERSION FACTORS (2 BITS), LABEL POINTER (18 BITS), SAVE
                    C         AREA POINTER (18 BITS), NUMBER OF ITEMS TO BE SAVED PER TIME
                    C         STEP (12 BITS), NUMBER OF TIME STEPS SAVED (6 BITS).
                    C  MICODE SCM-LCM FLAG (1 BIT), UNUSED (11 BITS), 0 IF COMMON, NONZERO
                    C         IS NUMBER OF CONTROL BLOCK (12 BITS), LOCATION OFFSET IN
                    C         BLOCK (18 BITS), LOCATION OF ITEM RELATIVE TO SCM OR LCM
                    C         DYNAMIC BLOCK (18 BITS).
                    *CEND                                                                               DEVL END
                    *CALL MTBLS
                    C
                    C  THERMAL PROPERTY EQUIVALENCE BLOCK.
                    C####  INTEGER NMTBLS(1),MTBPTR(1),MTBL(1)                                          ########
 ISN 00152          INTEGER NMTBLS(2,1),       MTBL(2,1)                                                INTEGER
 ISN 00153          REAL*8          MTBPTR(1)                                                           PACKWORD
 ISN 00154          REAL*8MTBLR(1)                                                                      #REAL*8#
 ISN 00155          EQUIVALENCE (NMTBLS(1),FA(1)),(MTBPTR(1),FA(1)), (MTBL(1),FA(1)),#FIA-FA#
                   * (MTBLR(1),FA(1))
                    *CEND                                                                               DEVL END
                    *CALL MTBLC
                    C
                    C  NMTBLS  NUMBER OF MATERIALS
                    C  MTBPTR  TABLE ERROR FLAG (1 BIT), NOT USED (29 BITS),
                    C          MATERIAL NUMBER (12 BITS), TABLE OFFSET (18 BITS).
                    C  MTBL    USED FOR INTEGER INFORMATION IN TABLE.
                    C  MTBLR   USED FOR REAL (FLOATING POINT) INFORMATION IN TABLE.
                    *CEND                                                                               DEVL END
                    *CALL MAXMEM
                    C
                    C  MAXIMUM STORAGE.
 ISN 00156          COMMON /MAXMEM/ MAXSCM,MAXLCM
                    *CEND                                                                               DEVL END
                    *CALL MAXMEMC
                    C
                    C  MAXSCM  MAXIMUM AMOUNT OF SCM (FAST MEMORY).
                    C  MAXLCM  MAXIMUM AMOUNT OF LCM.
                    *CEND                                                                               DEVL END
                    *CALL PUMPBLK
                    C
                    C PUMP BLOCK.
                    C
 ISN 00157          REAL*8      PMPRSP (1), PMPSPR (1), PMPRFL (1), PMPRHD (1),                         #REAL*8#
                   * PMPRTK (1), PMPINT (1), PMPRHO (1), PMPRMT (1), PMPTF1 (1),
                   * PMPTF2 (1), PMPTF3 (1), PMPTF4 (1), PMPOLD (1), PMPTHD (1),
                   * PMPTTK (1)
                    C
                    C&     REAL*8PMPSTIM(1),PMPSFSP(1),PMPSRSP(1),PMPTBL(1),PMPVTL(1)                   #REAL*8#
 ISN 00158          REAL*8PMPX07 (1),PMPX08 (1),PMPX09 (1),PMPTBL(1),PMPVTL(1)                          &JA L*8#
                    C
                    C####  INTEGER     IPUTDI (1), IPUHMI (1), IPUTMI (1), IPU2DI (1),                  ########
                    C#    * IPUMTK(1),IPUSPI(1),IPUTRP(1),IPURVI(1),IPMPTBL(1),                            #
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                    C#####* IPMVTR(1),IPMVAL(1),IPMVNM(1),IPMVPC(1),IPMVTL(1)                            ########
 ISN 00159          INTEGER   IPMVAL(2,1)                                                               INTEGER
                    C&     REAL*8      IPUTDI (1), IPUHMI (1), IPUTMI (1), IPU2DI (1),                  PACKWORD
                    C&    * IPUMTK(1),IPUSPI(1),IPUTRP(1),IPURVI(1),IPMPTBL(1),                         PACKWORD
                    C&    * IPMVTR(1),          IPMVNM(1),IPMVPC(1),IPMVTL(1)                           PACKWORD
 ISN 00160          REAL*8      IPUTDI (1), IPUHMI (1), IPUTMI (1), IPU2DI (1),                         &JA WORD
                   * IPUMTK(1),IPUSPI(1),IPUTRP(1),IPURVI(1),IPMX10 (1),                                &JA WORD
                   * IPMVTR(1),          IPMVNM(1),IPMVPC(10),IPMVTL(1)                                 &JA WORD
                    C
 ISN 00161          EQUIVALENCE  ( PMPOLD (1),FA( 6) )
 ISN 00162          EQUIVALENCE  ( PMPRSP (1),FA( 7) )
 ISN 00163          EQUIVALENCE  ( PMPSPR (1),FA( 8) )
 ISN 00164          EQUIVALENCE  ( PMPRFL (1),FA( 9) )
 ISN 00165          EQUIVALENCE  ( PMPRHD (1),FA(10) )
 ISN 00166          EQUIVALENCE  ( PMPRTK (1),FA(11) )
 ISN 00167          EQUIVALENCE  ( PMPINT (1),FA(12) )
 ISN 00168          EQUIVALENCE  ( PMPRHO (1),FA(13) )
 ISN 00169          EQUIVALENCE  ( PMPRMT (1),FA(14) )
 ISN 00170          EQUIVALENCE  ( PMPTF1 (1),FA(15) )
 ISN 00171          EQUIVALENCE  ( PMPTF2 (1),FA(16) )
 ISN 00172          EQUIVALENCE  ( PMPTF3 (1),FA(17) )
 ISN 00173          EQUIVALENCE  ( PMPTF4 (1),FA(18) )
                    C
                    C&     EQUIVALENCE  ( PMPSTIM (1),FA(19) )
 ISN 00174          EQUIVALENCE  ( PMPX07  (1),FA(19) )                                                 &JA
                    C&     EQUIVALENCE  ( PMPSFSP (1),FA(20) )
 ISN 00175          EQUIVALENCE  ( PMPX08  (1),FA(20) )                                                 &JA
                    C&     EQUIVALENCE  ( PMPSRSP (1),FA(21) )
 ISN 00176          EQUIVALENCE  ( PMPX09  (1),FA(21) )                                                 &JA
                    C
 ISN 00177          EQUIVALENCE  ( IPUTRP (1),FA(22) )                                                  #FIA-FA#
 ISN 00178          EQUIVALENCE  ( IPURVI (1),FA(23) )                                                  #FIA-FA#
 ISN 00179          EQUIVALENCE  ( IPUTDI (1),FA(24) )                                                  #FIA-FA#
 ISN 00180          EQUIVALENCE  ( IPUHMI (1),FA(25) )                                                  #FIA-FA#
 ISN 00181          EQUIVALENCE  ( IPUTMI (1),FA(26) )                                                  #FIA-FA#
 ISN 00182          EQUIVALENCE  ( IPU2DI (1),FA(27) )                                                  #FIA-FA#
 ISN 00183          EQUIVALENCE  ( IPUMTK (1),FA(28) )                                                  #FIA-FA#
 ISN 00184          EQUIVALENCE  ( IPUSPI (1),FA(29) )                                                  #FIA-FA#
                    C
 ISN 00185          EQUIVALENCE  ( PMPTHD (1),FA(30) )
 ISN 00186          EQUIVALENCE  ( PMPTTK (1),FA(31) )
                    C
                    C&     EQUIVALENCE  ( IPMPTBL (1),FA(32) ), ( PMPTBL (1),FA(32) )                   #FIA-FA#
 ISN 00187          EQUIVALENCE  ( IPMX10  (1),FA(32) ), ( PMPTBL (1),FA(32) )                          &JA -FA#
 ISN 00188          EQUIVALENCE (IPMVTR(1),FA(32)),(IPMVAL(1),FA(33)),                                  #FIA-FA#
                   * (IPMVNM(1),FA(34)),(IPMVPC(1),FA(35)),(IPMVTL(1),FA(36)),                          #FIA-FA#
                   * (PMPVTL(1),FA(37))
                    *CEND                                                                               DEVL END
                    *CALL PUMPBLK
                    C
                    C  PMPOLD  ACTUAL PUMP ANGULAR VELOCITY
                    C  PMPRSP  RATED PUMP ANGULAR VELOCITY
                    C  PMPSPR  RATIO OF INITIAL TO RATED PUMP VELOCITY
                    C  PMPRFL  RATED PUMP FLOW
                    C  PMPRHD  RATED PUMP HEAD
                    C  PMPRTK  RATED PUMP TORQUE
                    C  PMPINT  PUMP MOMENT OF INERTIA
                    C  PMPRHO  RATED OR INITIAL DENSITY
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                C  PMPRMT  RATED PUMP MOTOR TORQUE
                C  PMPTF1,PMPTF2,PMPTF3,PMPTFY   COEFFICIENTS FOR FRICTIONAL TORQUE AS A
                C          CUBIC FUNCTION OF SPEED RATIO
                C  PMPSTIM  ELAPSED TIME OF PUMP TRIP
                C  PMPSFSP  MAXIMUM FOWARD SPEED FOR TRIP
                C  PMPSRSP  MAXIMUM REVERSE SPEED FOR TRIP
                C  PMPTHD  PUMP HEAD.
                C  PMPTTK  PUMP TORQUE.
                C  IPUTRP  TRIP NUMBER FOR PUMP CUTOFF (12 BITS), UNUSED (12 BITS),
                C          TRIP LOCATION RELATIVE TO TRIP BLOCK (18 BITS), TRIP
                C          LOCATION RELATIVE TO DYNAMIC BLOCK (18 BITS).
                C  IPURVI  REVERSE INDICATOR
                C  IPUTDI  PUMP SINGLE PHASE TABLE INDICATOR
                C  IPUHMI  PUMP TWO PHASE HEAD MULTIPLIER TABLE DATA INDICATOR/POINTER
                C  IPUTMI PUMP TWO PHASE TORQUE MULTIPLIER TABLE INDICATOR/POINTER.
                C  IPU2DI TWO PHASE DIFFERENCE TABLE INDICATOR/POINTER.
                C  IPUMTK  PUMP MOTOR TORQUE TABLE DATA INDICATOR/POINTER
                C  IPUSPI  TIME DEPENDENT PUMP SPEED TABLE INDICATOR/POINTER
                C  IPMVTR  PUMP VELOCITY TABLE TRIP NUMBER (12 BITS), UNUSED (12
                C          BITS), TRIP LOCATION RELATIVE TO TRIP BLOCK (18 BITS),
                C          TRIP INDEX RELATIVE TO DYNAMIC BLOCK (18 BITS).
                C  IPMVAL  ALPHANUMERIC PART OF VARIABLE REQUEST CODE.
                C  IPMVNM  NUMERIC PART OF VARIABLE REQUEST CODE.
                C  IPMVPC  PACKED CODE FOR VARIABLE REQUEST, SCM-LCM FLAG (1 BIT),
                C          UNUSED  (11 BITS), 0 IF COMMON, NONZERO IS NUMBER OF
                C          CONTROL BLOCK (12 BITS), LOCATION OF OFFSET IN BLOCK
                C          (18 BITS), INDEX OF ITEM RELATIVE TO SCM OR LCM DYNAMIC
                C          BLOCK (18 BITS).
                C  IPMVTL  UNUSED (15 BITS), NUMBER OF ITEMS/ENTRY (15 BITS), TOTAL
                C          NUMBER OF ITEMS (15 BITS), CURRENT SUBSCRIPT (15 BITS).
                C  PMPVTL  ENTRIES FOR PUMP VELOCITY TABLE.
                *CEND                                                                  DEVL END
                *CALL RCOMPC
                C
  ISN 00189             COMMON /RCOMPC/ IVSKP,IJSKP,NCOMP,CMPSRC,CMPFLG,RCOMPV
  ISN 00190             LOGICAL CMPSRC,CMPFLG
                *CEND                                                                  DEVL END
                *CALL RCOMPCC
                C
                C  IVSKP  NUMBER OF WORDS PER VOLUME BLOCK
                C  IJSKP  NUMBER OF WORDS PER JUNCTION BLOCK
                C  RCOMPV END OF RCOMPN SEGMENT
                *CEND                                                                  DEVL END
                *CALL RK1NC
                C
                C  SPACE INDEPENDENT REACTOR KINETICS BLOCK.
                C####  INTEGER RKNUM(1),RKPTR1(1),RKPTR2(1),RKNSCR(1),RKDEN1(1),       ########
                C####+ RKDOP1(1),RKVOLN(1),RKHTNO(1)                                   ########
  ISN 00191             REAL*8  RKNUM(1),RKPTR1(1),RKPTR2(1),RKNSCR(1),RKDEN1(1),      PACKWORD
                      + RKDOP1(1),RKVOLN(1),RKHTNO(1)                                  PACKWORD
  ISN 00192             REAL*8RKBOL(1),RKRO(1),RKRN(1),RKOMEG(1),RKSLOB(1),RKDT(1),    #REAL*8#
                      + RKSUM(1),RKPOW(1),RKPOWG(1),RKPOWF(1),RKDEPV(1),
                      + RKCNH1(1),RKCNH2(1),RKCNH3(1),RKCNF1(1),RKCNF2(1),RKCNF3(1),
                      + RKF1(1),RKLMDA(1),RKDENR(1),RKDOPR(1),RKVWF(1),RKVTA(1),
                      + RKVDEN(1),RKFWF(1),RKFTA(1)
  ISN 00193             EQUIVALENCE (RKNUM(1),FA(1)),(RKPTR1(1),FA(2)),                ##1A-FA#
                      + (RKPTR2(1),FA(3)),(RKBOL(1),FA(4)),(RKRO(1),FA(5)),            ##1A-FA#
                      + (RKRN(1),FA(6)),(RKOMEG(1),FA(7)),(RKSLOB(1),FA(8)),
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                      + (RKDT(1),FA(9)),(RKSUM(1),FA(10)),(RKPOW(1),FA(11)),
                      + (RKPOWG(1),FA(12)),(RKPOWF(1),FA(13)),(RKDEPV(1),FA(13)),
                      + (RKF1(1),FA(14)),(RKLMDA(1),FA(15)),(RKCNH1(1),FA(16)),
                      + (RKCNH2(1),FA(17)),(RKCNH3(1),FA(18)),(RKCNF1(1),FA(19)),
                      + (RKCNF2(1),FA(20)),(RKCNF3(1),FA(21)),(RKNSCR(1),FA(1)),       ##1A-FA#
                      + (RKDEN1(1),FA(1)),(RKDENR(1),FA(2)),(RKDOP1(1),FA(1)),         ##1A-FA#
                      + (RKDOPR(1),FA(2)),(RKVOLN(1),FA(1)),(RKVWF(1),FA(2)),          ##1A-FA#
                      + (RKVTA(1),FA(3)),(RKVDEN(1),FA(4)),(RKHTNO(1),FA(1)),          ##1A-FA#
                      + (RKFWF(1),FA(2)),(RKFTA(1),FA(3))
                *CEND                                                                  DEVL END
                *CALL RK1NCC
                C  RKNUM   INITIALIZATION FLAG (1 BIT), CONTROL VARIABLE FOR CALCULATING
                C          CM FUNCTIONS (11 BITS), NUMBER OF DELAY GROUPS (12 BITS),
                C          NUMBER OF REACTOR KINETICS EQUATIONS (12 BITS), OFFSET FOR
                C          LOOPS OVER DELAY GROUPS (12 BITS), OFFSET FOR LOOPS OVER ALL
                C          REACTOR KINETICS EQUATIONS (12 BITS).
                C  RKPTR1  NUMBER OF SCRAM CURVES (6 BITS), POINTER TO SCRAM TABLE
                C          LIST (18 BITS), POINTER TO DENSITY REACTIVITY TABLE (18
                C          BITS), POINTER TO DOPPLER REACTIVITY TABLE (18 BITS).
                C  RKPTR2  NUMBER OF VOLUMES IN VOLUME REACTIVITY FEEDBACK (12 BITS),
                C          POINTER TO VOLUME FEEDBACK DATA (18 BITS), NUMBER OF HEAT
                C          STRUCTURES IN REACTIVITY FEEDBACK (12 BITS), POINTER TO
                C          HEAT STRUCTURE FEEDBACK DATA (18 BITS).
                C  RKBOL   DELAYED NEUTRON FRACTION OVER GENERATION TIME.
                C  RKRO    REACTIVITY BIAS AFTER INITIALIZATION.
                C  RKRN    CURRENT REACTIVITY.
                C  RKOMEG  CURRENT RECIPRICAL PERIOD.
                C  RKSLOB  SOURCE DIVIDED BY DELAYED NEUTRON FRACTION OVER GENERATION
                C  RKDT    REACTOR KINETIC TIME STEP.
                C  RKPOW   TOTAL REACTOR POWER, I.E., THE SUM OF FISSION POWER AND
                C          GAMMA DECAY POWER.
                C  RKPOWF  POWER FROM FISSION.
                C  RKPOWG  POWER FROM GAMMA DECAY.
                C  RKF1    DELAYED NEUTRON AND GAMMA YIELD FRACTIONS.
                C  RKLMDA  DECAY CONSTANTS FOR DELAYED NEUTRONS AND GAMMA DECAY.
                C  RKNSCR  UNUSED (30 BITS), POINTER IN GENERAL TABLE FOR SCRAM
                C          REACTIVITY CURVE (18 BITS), GENERAL TABLE NUMBER OF
                C          SCRAM CURVE (12 BITS).
                C  RKDEN1  DENSITY REACTIVITY TABLE CONTROL, UNUSED (15 BITS), NUMBER
                C          OF ITEMS/ENTRY (=2) (15 BITS), TOTAL NUMBER OF ENTRIES (15
                C          BITS), CURRENT SUBSCRIPT (15 BITS).
                C  RKDENR  DENSITY REACTIVITY TABLE.
                C  RKDOP1  DOPPLER REACTIVITY TABLE CONTROL, UNUSED (15 BITS), NUMBER
                C          OF ITEMS/ENTRY (=2) (15 BITS), TOTAL NUMBER OF ENTRIES (15
                C          BITS), CURRENT SUBSCRIPT (15 BITS).
                C  RKDOPR  DOPPLER REACTIVITY TABLE.
                C  RKVOLN  INDEX TO VOLUME (18 BITS), POSITION OF VOLUME (12 BITS),
                C          VOLUME NUMBER (30 BITS).
                C  RKVWF   DENSITY WEIGHT FOR VOLUME FEEDBACK.
                C  RKVTA   VOLUME TEMPERATURE REACTIVITY COEEFICIENT.
                C  RKVDEN  INITIAL VOLUME DENSITY.
                C  RKHTNO  UNUSED (18 BITS), POSITION OF HEAT STRUCTURE (12 BITS),
                C          HEAT STRUCTURE NUMBER (30 BITS).
                C  RKFWF   DOPPLER WEIGHT FOR HEAT STRUCTURE FEEDBACK.
                C  RKFTA   HEAT STRUCTURE TEMPERATURE REACTIVITY COEEFICIENT.
                *CEND                                                                  DEVL END
                *CALL STATC
                C
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                C####  INTEGER STSRDC(1),STSSKP(1),STSJPT(1),STSATP(1),STSREQ(1),          ########
                C#     * STSLTE(1),STSSCL(1),STSRCL(1),STSRXL(1),STSREX(1),                      #
                C####* STSRTE(1),STSRPE(1),STSJCK(1)                                       ########
   ISN 00194            INTEGER          STSSKP(2,1)          ,STSATP(2,1)                INTEGER
   ISN 00195            INTEGER                    STSJPT(2,1)          ,STSREQ(2,1)       INTEGER
   ISN 00196            REAL*8  STSRDC(1),                                                 PACKWORD
                      * STSLTE(1),STSSCL(1),STSRCL(1),STSRXL(1),STSREX(1),                 PACKWORD
                      * STSRTE(1),STSRPE(1),STSJCK(1)                                      PACKWORD
   ISN 00197            REAL*8STSCPU(1),STSDTN(1),STSDTX(1),STSDTA(1)                      #REAL*8#
   ISN 00198            EQUIVALENCE (STSRDC(1),LFA(1)),(STSSKP(1),LFA(2)),                 #LIA-LFA
                      * (STSJPT(1),LFA(3)),(STSATP(1),LFA(4)),(STSREQ(1),LFA(5)),          #LIA-LFA
                      * (STSCPU(1),LFA(6)),(STSDTN(1),LFA(7)),(STSDTX(1),LFA(8)),
                      * (STSDTA(1),LFA(9)),(STSLTE(1),LFA(10)),(STSSCL(1),LFA(11)),        #LIA-LFA
                      * (STSRCL(1),LFA(12)),(STSRXL(1),LFA(13)),(STSREX(1),LFA(14)),       #LIA-LFA
                      * (STSRTE(1),LFA(15)),(STSRPE(1),LFA(16)),(STSJCK(1),LFA(1))        #LIA-LFA
                *CEND                                                                      DEVL END
                *CALL STATCC
                C
                C  BLOCK FOR STATISTICS DURING ADVANCEMENT.
                C  STSRDC  NUMBER OF REPEATED TIME STEPS, FIRST THIRTY BITS FOR ENTIRE
                C          PROBLEM, LAST 30 BITS DURING THIS MAJOR PRINT INTERVAL.
                C  STSSKP  SKIP FACTOR FOR VOLUME ARRAYS.
                C  STSJPT  POINTER TO JUNCTION ARRAY.
                C  STSATP  TOTAL NUMBER OF ADVANCEMENTS.
                C  STSREQ  TOTAL NUMBER OF REQUESTED ADVANCEMENTS.
                C  STSCPU  CPU TIME REQUIRED.
                C  STSDTN  MINIMUM TIME STEP DURING EDIT.
                C  STSDTX  MAXIMUM TIME STEP DURING EDIT.
                C  STSDTA  SUM OF TIME STEPS FOR AVERGE OVER EDIT.
                C  STSLTE  NUMBER OF TIMES VOLUME HAD LARGEST MASS ERROR, DIVIDED AS
                C          STSRDC.
                C  STSSCL  NUMBER OF TIMES VOLUME HAD SMALLEST COURANT LIMIT, DIVIDED AS
                C          STSRDC.
                C  STSRCL  NUMBER OF TIMES COURANT LIMIT FOR THIS VOLUME CAUSED REDUCED
                C          TIME STEP, DIVIDED AS STSRDC.
                C  STSRXL  NUMBER OF TIMES QUALITY ADJUSTMENT IN VOLUME CAUSED REDUCED
                C          TIME STEPS, DIVIDED AS STSRDC.
                C  STSREX  NUMBER OF TIMES STATE EXTRAPOLATION IN VOLUME CAUSED REDUCED
                C          TIME STEPS, DIVIDED AS STSRDC.
                C  STSRTE  NUMBER OF TIMES MASS ERROR IN VOLUME CAUSED REDUCED TIME
                C          STEPS, DIVIDED AS STSRDC.
                C  STSRPE  NUMBER OF TIMES WATER PROPERTY ERROR IN VOLUME CAUSED REDUCED
                C          TIME STEPS, DIVIDED AS STSRDC.
                C  STSJCK  NUMBER OF TIMES JUNCTION CHOKED, DIVIDED AS STSRDC.
                *CEND                                                                      DEVL END
                *CALL TOPPTR
                C
                C  TIME DEPENDENT VOLUME-JUNCTION POINTERS.
                C####  INTEGER NTDPVS(1)                                                   ########
   ISN 00199            REAL*8  NTDPVS(1)                                                  PACKWORD
   ISN 00200            EQUIVALENCE (NTDPVS(1),LFA(1))
                *CEND                                                                      DEVL END
                *CALL TIMEC
                C
                C  TRANSIENT TIMING COMMON.
   ISN 00201            COMMON /TIMEC/ TIMEI(19),NENTRY(19)
                *CEND                                                                      DEVL END
                *CALL TIMECC
```

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                C
                C  TIMEI  EXECUTION TIME FOR SUBROUTINE.
                C  NENTRY NUMBERS OF ENTRIES FOR SUBROUTINE.
                *CEND                                                                      DEVL END
                C
                C  SEE TRNCTL FOR STATEMENTS FOR COMMON /TRNHLP/.  NOT INCLUDED HERE
                C  BECAUSE OF A CONFLICT WITH IJSKP AND IVSKP IN RCOMPC.
                *CALL TRNHLPC
                C
                C  IC       INDEX OF START OF COMPONENT BLOCK + 1
                C  NC       NUMBER OF COMPONENTS
                C  IV,IVE,IVSKP  DO LOOP PARAMETERS FOR VOLUME BLOCK
                C  IJ,IJE,IJSKP  DO LOOP PARAMETERS FOR JUNCTION BLOCK
                C  IXIPR    POINTER INDICATING FIRST NONZERO IN ROW OF SOLUTION MATRIX
                C  IXIP     POINTER TO CONTROL ARRAY FOR MATRIX INVERSION ROUTINE
                C  IXW      POINTER TO WORK ARRAY FOR MATRIX INVERSION ROUTINE
                C  IXPV     POINTER TO ARRAY FOR RIGHT HAND SIDE
                C  IXIRNR   POINTER TO ARRAY HOLDING POSITION OF NONZEROS FOR MATRIX
                C           INVERSION ROUTINE
                C  IXIRN    SIMILAR FUNCTION TO IXIRNR FOR PREVIOUSLY INVERTED ARRAY.
                C  IXCOFP   POINTER TO ARRAY HOLDING NONZERO VALUES OF MATRIX
                C  NVP      ORDER OF MATRIX, ALSO NUMBER OF NON-TIME DEPENDENT VOLUMES
                C  NNZ      NUMBER OF NONZERO ELEMENTS IN SOLUTION MATRIX
                C  GERR,GERRS  ESTIMATED ERROR IN INVERSION PROCESS, AND ERROR AT WHICH
                C           SCALING AND SOLUTION ORDER WILL BE REEVALUATED.
                C  MTYPE    TYPE OF MATRIX MULTIPLY, NEEDED IN CALL TO MATRIX PRODUCT
                C           ROUTINE
                C  SFLAG    INDICATES WHETHER NEW SCALING AND SOLUTION ORDER NEEDED
                *CEND                                                                      DEVL END
                *CALL TRPBLK
                C
                C  TRIP BLOCK
                C####  INTEGER NTRP(1),NTRPST(1),NTRCV1(1),NTRCV2(1),NTRNV1(1),          ########
                C####* NTRNV2(1),NTRPC1(1),NTRPC2(1),NTRTR1(1),NTRTR2(1)                  ########
   ISN 00202            REAL*8                        NTRCV1(1),NTRCV2(1)                CHARACTR
   ISN 00203            REAL*8  NTRP(1),NTRPST(1),                    NTRNV1(1),         PACKWORD
                      * NTRNV2(1),NTRPC1(1),NTRPC2(1),NTRTR1(1),NTRTR2(1)                  PACKWORD
   ISN 00204            REAL*8TRPTIM(1),TRPCON(1)                                        #REAL*8#
   ISN 00205            EQUIVALENCE (NTRP(1),LFA(1)),(NTRPST(1),LFA(2)),                   #LIA-LFA
                      * (TRPTIM(1),LFA(3)),(NTRCV1(1),LFA(4)),(NTRCV2(1),LFA(5)),          #LIA-LFA
                      * (NTRNV1(1),LFA(6)),(NTRNV2(1),LFA(7)),(NTRPC1(1),LFA(8)),          #LIA-LFA
                      * (NTRPC2(1),LFA(9)),(TRPCON(1),LFA(10))                             #LIA-LFA
   ISN 00206            EQUIVALENCE (NTRTR1(1),LFA(4)),(NTRTR2(1),LFA(5))                  #LIA-LFA
                *CEND                                                                      DEVL END
                *CALL TRPBLKC
                C
                C  NTRP    UNUSED (12 BITS), SKIP FACTOR FOR LOGICAL TRIPS (6 BITS),
                C          SKIP FACTOR FOR VARIABLE TRIPS (6 BITS), OFFSET TO LOGICAL
                C          ARRAYS (18 BITS), NUMBER OF LOGICAL TRIPS (9 BITS), NUMBER
                C          OF VARIABLE TRIPS (9 BITS).
                C  NTRPST  CONTAINS TWO TRIP NUMBER FOR STOPPING ADVANCEMENT.  INDEX
                C          FOR FIRST TRIP (18 BITS), FIRST TRIP NUMBER (12 BITS), LAST
                C          30 BITS THE SAME AS THE FIRST 30 BUT FOR THE SECOND TRIP
                C          NUMBER.  ZEROS MEAN TRIP NOT ENTERED.
                C  TRPTIM  TIME TRIP WAS SET, ALSO USED USED AS TRIP SWITCH.  NEGATIVE
                C          IF TRIP NOT SET OR FALSE, POSITIVE IF SET OR TRUE AND THE
                C          VALUE IS THE TIME THE TRIP WAS SET.
                C  NTRCV1  VARIABLE CODE, LEFT SIDE.
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                C  NTRCV2  VARIABLE CODE, RIGHT SIDE.
                C  NTRNV1  UNUSED (1 BIT), TRIP NUMBER (11 BITS), PARAMETER FOR LEFT
                C          SIDE (48 BITS).
                C  NTRNV2  LATCH SWITCH (1 BIT), OPERATION CODE (11 BITS), PARAMETER
                C          FOR RIGHT SIDE (48 BITS).
                C  NTRPC1  PACKED CODE FOR LEFT SIDE, SCM-LCM FLAG (1 BIT), 1 IF TIMEOF
                C          IS VARIABLE, 0 OTHERWISE (1 BIT), UNUSED (10 BITS), 0 IF
                C          COMMON, NONZERO IS NUMBER OF CONTROL BLOCK (12 BITS), OFFSET
                C          IN BLOCK (18 BITS), LOCATION OF ITEM RELATIVE TO SCM OR LCM
                C          DYNAMIC BLOCK (18 BITS).
                C  NTRPC2  PACKED CODE FOR RIGHT SIDE, SAME FORMAT AS FOR NTRPC1.
                C  TRPCON  CONSTANT ON RIGHT SIDE.
                C  NTRTR1  UNUSED (1 BIT), TRIP NUMBER (11 BITS), UNUSED (21 BITS),
                C          LEFT COMPARISON TRIP NUMBER (9 BITS), LOCATION OF LEFT
                C          COMPARISON TRIP NUMBER (18 BITS).
                C  NTRTR2  LATCH SWITCH (1 BIT), OPERATION CODE (11 BITS), UNUSED (21
                C          BITS), RIGHT COMPARISON TRIP NUMBER (9 BITS), LOCATION OF
                C          RIGHT COMPARISON TRIP NUMBER (18 BITS).
                *CEND                                                          DEVL END
                *CALL TSTPCTL
                C
   ISN 00207            REAL*8TSPEND(1),DTMIN(1),DTMAX(1)                    #REAL*88
                C####   INTEGER CURCTL(1),TSPPAC(1)                           ########
   ISN 00208            REAL*8  CURCTL(1),TSPPAC(1)                           PACKWORD
   ISN 00209            EQUIVALENCE (CURCTL(1),LFA(1)),(TSPEND(1),LFA(2)),    #LIA-LFA
                      * (DTMIN(1),LFA(3)),(DTMAX(1),LFA(4)),(TSPPAC(1),LFA(5)) #LIA-LFA
                *CEND                                                          DEVL END
                *CALL TSTPCTC
                C
                C  CURCTL  CURRENT STATUS OF COUNTERS FOR PRINT, PLOT, AND RESTART
                C  TSPEND  TIME END FOR ASSOCIATED TIME STEP VALUES AND COUNTERS
                C  DTMIN   MINIMUM TIME STEP
                C  DTMAX   MAXIMUM TIME STEP
                C  TSPPAC  CONTAINS TIME STEP CONTROL OPTION, MINOR EDIT, MAJOR EDIT,
                C          AND RESTART FREQUENCIES PACKED AS 4 FIFTEEN BIT NUMBERS
                *CEND                                                          DEVL END
                *CALL VOLDAT
                C
                C  VOLUME BLOCK
   ISN 00210            REAL*8DIAMV(1),DMOP(1),DMDRU(1),DMDX(1),DQTM(1),DRDP(1),  #REAL*88
                      * DRDRU(1),DRDX(1),
                      * P      (1), PO     (1), Q      (1), QUALE (1), QUALS (1), QUALSO(1),
                      * RHO    (1), RHOF   (1), RHOG   (1), RHOM  (1), RHOO  (1), U     (1),
                      * UF     (1), UG     (1), UO     (1), V     (1), VELF  (1), VELG  (1),
                      * VNEW   (1), VOIDF (1), VOIDG (1), TEMP  (1), ROUGHV(1), AVOL  (1),
                      * TEMPF(1),TEMPG(1),DZ(1),DL(1),SOUNDE(1),
                      * FWALF (1), FWALG (1), SATT  (1), SATVF (1), SATVG (1),
                      * SATHF(1), SATHG(1), SATCPF(1), SATCPG(1), CPSPH(1),
                      * FAAV(1),VISCF(1),VISCG(1),SIGMA(1),QUALA(1),QUALAO(1),
                      * DRDA(1),DMDA(1),BORON(1),BORONO(1),DQTMO(1)
                C####   INTEGER NVOLS(1),NVSKP(11),VCTRL(1),VOLNO(1),IMAP(1)  ########
   ISN 00211            INTEGER NVOLS(2,1)                                    INTEGER
   ISN 00212            INTEGER          NVSKP(2,11),       VOLNO(2,1)        INTEGER
   ISN 00213            REAL*8                    VCTRL(1),         IMAP(1)   PACKWORD
                C
   ISN 00214             EQUIVALENCE    ( NVOLS (1),FA( 1) )                  ##IA-FA#
   ISN 00215             EQUIVALENCE    ( NVSKP (1),FA( 2) )                  ##IA-FA#
   ISN 00216             EQUIVALENCE    ( ROUGHV(1),FA( 3) )
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FACOM OSIV/F4 FORTRAN IV (HE)  V04L18        MAIN  DATE 83.07.06  TIME 13.40.29                    PAGE   65
   ISN 00217             EQUIVALENCE    ( DIAMV (1),FA( 4) )
   ISN 00218             EQUIVALENCE    ( DMOP  (1),FA( 5) )
   ISN 00219             EQUIVALENCE    ( DMDRU (1),FA( 6) )
   ISN 00220             EQUIVALENCE    ( DMDX  (1),FA( 7) )
   ISN 00221             EQUIVALENCE    ( DQTM  (1),FA( 8) )
   ISN 00222             EQUIVALENCE    ( SOUNDE(1),FA( 9) )
   ISN 00223             EQUIVALENCE    ( VCTRL (1),FA(10) )                  ##IA-FA#
   ISN 00224             EQUIVALENCE    ( DRDP  (1),FA(11) )
   ISN 00225             EQUIVALENCE    ( DRDRU (1),FA(12) )
   ISN 00226             EQUIVALENCE    ( DRDX  (1),FA(13) )
   ISN 00227             EQUIVALENCE    ( VOLNO (1),FA(14) )                  ##IA-FA#
   ISN 00228             EQUIVALENCE    ( P     (1),FA(15) )
   ISN 00229             EQUIVALENCE    ( QUALS (1),FA(16) )
   ISN 00230             EQUIVALENCE    ( U     (1),FA(17) )
   ISN 00231             EQUIVALENCE    ( TEMP  (1),FA(18) )
   ISN 00232             EQUIVALENCE    ( RHO   (1),FA(19) )
   ISN 00233             EQUIVALENCE    ( PO    (1),FA(20) )
   ISN 00234             EQUIVALENCE    ( QUALSO(1),FA(21) )
   ISN 00235             EQUIVALENCE    ( UO    (1),FA(22) )
   ISN 00236             EQUIVALENCE    ( RHOO  (1),FA(23) )
   ISN 00237             EQUIVALENCE    ( RHOM  (1),FA(24) )
   ISN 00238             EQUIVALENCE    ( QUALE (1),FA(25) )
   ISN 00239             EQUIVALENCE    ( RHOF  (1),FA(26) )
   ISN 00240             EQUIVALENCE    ( RHOG  (1),FA(27) )
   ISN 00241             EQUIVALENCE    ( UF    (1),FA(28) )
   ISN 00242             EQUIVALENCE    ( UG    (1),FA(29) )
   ISN 00243             EQUIVALENCE    ( V     (1),FA(30) )
   ISN 00244             EQUIVALENCE    ( VNEW  (1),FA(31) )
   ISN 00245             EQUIVALENCE    ( VELF  (1),FA(32) )
   ISN 00246             EQUIVALENCE    ( VELG  (1),FA(33) )
   ISN 00247             EQUIVALENCE    ( VOIDF (1),FA(34) )
   ISN 00248             EQUIVALENCE    ( VOIDG (1),FA(35) )
   ISN 00249             EQUIVALENCE    ( AVOL  (1),FA(36) )
   ISN 00250             EQUIVALENCE    ( TEMPF (1),FA(37) )
   ISN 00251             EQUIVALENCE    ( TEMPG (1),FA(38) )
   ISN 00252             EQUIVALENCE    ( DZ    (1),FA(39) )
   ISN 00253             EQUIVALENCE    ( DL    (1),FA(40) )
   ISN 00254             EQUIVALENCE    ( Q     (1),FA(41) )
   ISN 00255            EQUIVALENCE (IMAP(1),FA(42))                          ##IA-FA#
   ISN 00256             EQUIVALENCE    ( FWALF (1),  FA(43) )
   ISN 00257             EQUIVALENCE    ( FWALG (1),  FA(44) )
   ISN 00258             EQUIVALENCE    ( SATT  (1),FA(45) )
   ISN 00259             EQUIVALENCE    ( SATVF (1),FA(46) )
   ISN 00260             EQUIVALENCE    ( SATVG (1),FA(47) )
   ISN 00261             EQUIVALENCE    ( SATHF (1),FA(48) )
   ISN 00262             EQUIVALENCE    ( SATHG (1),FA(49) )
   ISN 00263             EQUIVALENCE    ( SATCPF(1),FA(50) )
   ISN 00264             EQUIVALENCE    ( SATCPG(1),FA(51) )
   ISN 00265             EQUIVALENCE    ( CPSPH (1),FA(52) )
   ISN 00266             EQUIVALENCE     ( FAAV  (1),FA(53) )
   ISN 00267             EQUIVALENCE    ( VISCF (1),FA(54) )
   ISN 00268             EQUIVALENCE    ( VISCG (1),FA(55) )
   ISN 00269             EQUIVALENCE    ( SIGMA (1),FA(56) )
   ISN 00270             EQUIVALENCE    ( QUALA (1),  FA(57) )
   ISN 00271             EQUIVALENCE    ( QUALAO(1),  FA(58) )
   ISN 00272             EQUIVALENCE    ( DRDA  (1),  FA(59) )
   ISN 00273             EQUIVALENCE    ( DMDA  (1),  FA(60) )
   ISN 00274             EQUIVALENCE    (BORON(1)   , FA(61)  )
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   ISN 00275            EQUIVALENCE    (BORONO(1) , FA(62)  )
   ISN 00276            EQUIVALENCE    (DOTMO(1)  , FA(63) )
                  C  ADDITIONAL VARIBLES FOR TIME DEPENDENT VOLUMES.
   ISN 00277            REAL*8DP(1), DPO(1)                                              #REAL*8#
   ISN 00278            EQUIVALENCE  (DP(1),DMOX(1)), (DPO(1),DOTM(1))
                  *CEND                                                                  DEVL END
                  *CALL VOLDATC
                  C
                  C   RHO      TOTAL DENSITY
                  C   RHOM     TOTAL DENSITY FOR MASS ERROR CHECK
                  C   RHOO     TOTAL DENSITY PREVIOUS TIME STEP
                  C   RHOF     LIQUID DENSITY
                  C   RHOG     VAPOR DENSITY
                  C   U        TOTAL SPECIFIC INTERNAL ENERGY
                  C   UO       TOTAL SPECIFIC INTERNAL ENERGY PREVIOUS TIME STEP
                  C   UF       LIQUID SPECIFIC INTERNAL ENERGY
                  C   UG       VAPOR SPECIFIC INTERNAL ENERGY
                  C   VNEW     NEW TIME VOLUME FOR INTERFACE TRACKING
                  C   V        VOLUME
                  C   VOIDF    LIQUID VOID-FRACTION
                  C   VOIDG    VAPOR VOID-FRACTION
                  C   VELF     AVERAGE LIQUID VELOCITY IN A VOLUME
                  C   VELG     AVERAGE VAPOR VELOCITY IN A VOLUME
                  C   P        AVERAGE PRESSURE
                  C   PO       AVERAGE PRESSURE PREVIOUS TIME STEP
                  C   DP       PRESURE DIFFERENCE BETWEEN NEW TIME AND OLD TIME
                  C   DPO      PRESURE DIFFERENCE BETWEEN NEW TIME AND OLD TIME PREVIOUS
                  C            TIME STEP
                  C   QUALS    STATIC QUALITY
                  C   QUALSO   STATIC QUALITY PREVIOUS TIME STEP
                  C   QUALE    EQUILIBRIUM QUALITY
                  C   DROP     PARTIAL OF DENSITY W/R TO PRESSURE
                  C   DRDRU    PARTIAL OF DENSITY W/R TO SPECIFIC INTERNAL ENERGY
                  C   DRDX     PARTIAL OF DENSITY W/R TO STATIC QUALITY
                  C   DMDP     PARTIAL OF MASS W/R TO PRESSURE
                  C   DMDX     PARTIAL OF MASS W/R TO STATIC QUALITY
                  C   DMDRU    PARTIAL OF MASS W/R TO SPECIFIC INTERNAL ENERGY
                  C   DOTM     FIRST TERM OF MASS-TRANSFER EQUATION
                  C   VCTRL    CONTAINS PACKED CONTROL DATA.  TIME DEPENDENT VOLUME FLAG (1
                  C            BIT), INPUT FLAG (1 BIT), INITIALIZATION
                  C            TYPE(10BITS),UNUSED(18BITS),JETP INFO(6BITS) ,UNUSED(15BITS),JETPMP
                  C            MDOT FLAGS(3BITS),                                        JETPMP
                  C            UNUSED (4 BITS), WALL FRICTION FLAG (1 BIT),
                  C            EQUILIBRIUM FLAG (1 BIT).
                  C            IN SOLUTION ROUTINES, FIRST 30 BITS ARE TIME DEPENDENT
                  C            VOLUME FLAG (1 BIT), INDEX FOR DIAGONAL POSITION IN SOLUTION
                  C            MATRIX (17 BITS), AND SOLUTION VOLUME NUMBER EXCLUDING TIME
                  C            DEPENDENT VOLUMES (12 BITS)
                  C           *****NOTE BY DLC*****14JUNE82                              JETPMP
                  C            IN TRANSIENT.  1ST 30 BITS ARE USED AS INDICATED ABOVE.   JETPMP
                  C            NEXT 6 BITS ARE FOR JET PUMP INFO( NUMBER OF JETPUMPS     JETPMP
                  C            BEING SIMULATED BY JETPUMP COMPOMENT)                     JETPMP
                  C            NEXT 5 BITS ARE SET IN DTSTEP( TIME STEP CONTROL INFO)    JETPMP
                  C            NEXT 6 BITS ARE UNUSED                                    JETPMP
                  C            NEXT 5 BITS ARE SET IN STATE ( TIME STEP CONTROL INFO)    JETPMP
                  C            REST OF BITS ARE AS DESCRIBED ABOVE( MDOT FLAGS ETC)      JETPMP
                  C       FOR JAERI JETPUMP,.SUBROUTINE DTSTEP UPDATED TO KEEP JETPUMP   JETPMP
                  C            INFO FROM BEING WIPED OUT WHEN SOLUTION IS ADVANCED       JETPMP
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                  C   VOLNO    VOLUME NUMBER FOR EDITING.
                  C   NVOLS    NUMBER OF VOLUMES
                  C   NVSKP    VOLUME SKIP FACTOR
                  C   Q        VOLUME HEAT SOURCE
                  C   FLOW REGIME MAP.
                  C   DIAMV    EQUIVALENT FLOW DIAMETER
                  C   TEMP     AVERAGE VOLUME TEMPERATURE
                  C   ROUGHV   WALL ROUGHNESS FACTOR
                  C   AVOL     AREA OF VOLUME
                  C   TEMPF    LIQUID TEMPERATURE
                  C   TEMPG    VAPOR TEMPERATURE
                  C   DZ       ELEVATION CHANGE
                  C   DL       VOLUME LENGTH
                  C   SOUNDE   EQUILIBRIUM SOUND SPEED.
                  *CEND                                                                  DEVL END
                  C
                  C  DATA FOR GENRL COMMON
                  C#      DATA FAIL/.FALSE./, IROUTE/-1/, NCASE/-1/                      ###
                  C#      DATA PTITLE/'RELAP5/MOD','1/001','REACTOR LO','SS OF COOL',    ###
                  C#    * 'ANT ANALYS','IS PROGRAM',' '/                                 ###
   ISN 00279            FAIL = .FALSE.                                                   $JA
   ISN 00280            IROUTE = DBIT(-1)                                                $JA
   ISN 00281            NCASE = -1                                                       $JA
   ISN 00282            CALL DATE(CTITLE(11))                                            $JA
   ISN 00283            PTITLE(1) = 8HRELAP5/M                                           $JA
   ISN 00284            PTITLE(2) = 8HOD1/001                                            $JA
   ISN 00285            PTITLE(3) = 8H    REAC                                           $JA
   ISN 00286            PTITLE(4) = 8HTOR LOSS                                           $JA
   ISN 00287            PTITLE(5) = 8H OF COOL                                           $JA
   ISN 00288            PTITLE(6) = 8HANT ANAL                                           $JA
   ISN 00289            PTITLE(7) = 8HYSIS PRO                                           $JA
   ISN 00290            PTITLE(8) = 8HGRAM                                               $JA
                  C
                  C  CALL INPUT PROCESSING SUBROUTINE
   ISN 00291        100  CALL INPUT
                  C  TEST IF END OF PROBLEMS
   ISN 00292            IF (NCASE .EQ. 0) GO TO 1000
                  C  BRANCH TO APPROPRIATE PROCESSING SUBROUTINE
                  C#      GO TO (200,200,300,400,500,600,700), IROUTE                    ###
   ISN 00293            INTIRT = INTD(IROUTE)                                            YJA 0600
   ISN 00294            GO TO (200,200,300,400,500,600,700), INTIRT                      YJA 0600
                  C  CALL STEADY STATE SUBROUTINE
   ISN 00295        200  CALL STSTAT
   ISN 00296            IF (FAIL) GO TO 900
                  C#      IF (IROUTE .EQ. 1) GO TO 550
   ISN 00297            IF (LEQ(IROUTE,DBIT(1))) GO TO 550                               YJA
                  C  CALL TRANSITION PROCESSING SUBROUTINE
   ISN 00298        300  CALL TRNSIS
   ISN 00299            IF (FAIL) GO TO 900
                  C  CALL TRANSIENT PROCESSING SUBROUTINE
   ISN 00300        400  CALL TRNCTL
                  C  DO FINAL ACTION OR RESTART-PLOT FILE.
   ISN 00301        550  CALL RSTFIN
                  C  CALL PLOT SUBROUTINE
   ISN 00302        500 CALL PLOTMD
   ISN 00303            GO TO 900
                  C  CALL REEDIT SUBROUTINE
   ISN 00304        600  CALL REEDIT
```

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   ISN 00305           GO TO 900
                     C  CALL TAPE STRIPPING PROGRAM
   ISN 00306         700  CALL STRIP
                     C  TEST IF NO MORE DATA
   ISN 00307         900  IF (NCASE .NE. 0) GO TO 100
   ISN 00308        1000  STOP
```

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SPECIFIED OPTIONS: NONAME,FLAG(I),BYNAME,GOSTMT,NOSTATIS,ISN(0),NOMAP,ELM(*)

                     *DECK RBRNCH
   ISN 00001               SUBROUTINE RBRNCH
                     *CALL DECLARE                                                          ########
                     C.........................RELAP5/MOD1 IS IMPLEMENTED ON A FACOM M-200 COMPUTER#
   ISN 00002               IMPLICIT REAL*8(A-H,O-Z)                                          AT  #
                     C.............................DECLARE FUNCTION(FOR PACKWORD) TYPE....  JAPAN#
   ISN 00003               REAL*8   DAND,DOR,DNOT,SHLFT,DMASK,XOR,DADD,DBIT,SHIFTD,SHIFTI    ATOMIC#
   ISN 00004               INTEGER  INTD,IDAND,ISHIFT,IDIB                                   ENERGY#
   ISN 00005               LOGICAL  LLT,LLE,LEQ,LNE,LGT,LGE                                  RESEARCH
                     C.....................................................................INSTITUTE
                     *CEND                                                                  DEVL END
                     C  PROCESS BRANCH OR SEPARATOR COMPONENT DATA.
                     *CALL CMPDAT
                     C
                     C  DEFINITIONS COMMON TO ALL COMPONENTS
                     C####  INTEGER NCMPS(1),CMPNUM(1),CMPNAM(1),CMPTYP(1),NVC(1),NJC(1)     ########
   ISN 00006               REAL*8  NCMPS(1),CMPNUM(1)                      ,NVC(1),NJC(1)     PACKWORD
   ISN 00007               REAL*8                        CMPNAM(1),CMPTYP(1)                 CHARACTR
   ISN 00008               EQUIVALENCE (NCMPS(1),FA(1)),(CMPNUM(1),FA(1)),                   ##1A-FA#
                         * (CMPNAM(1),FA(2)),(CMPTYP(1),FA(3)),(NVC(1),FA(4)),               ##1A-FA#
                         * (NJC(1),FA(5))                                                    ##1A-FA#
                     C  DEFINITIONS FOR TIME DEPENDENT VOLUMES AND JUNCTIONS
                     C####  INTEGER NCTTRP(1),NCTALF(1),NCTDPV(1),NCTPC(1),NCTBLE(1)         ########
   ISN 00009               REAL*8             NCTALF(1)                                      CHARACTR
   ISN 00010               INTEGER                        NCTDPV(2,1)                        INTEGER
   ISN 00011               REAL*8  NCTTRP(1),                        NCTPC(1),NCTBLE(1)      PACKWORD
   ISN 00012               REAL*8CMPTBL(1)                                                   #REAL*8#
   ISN 00013               EQUIVALENCE (NCTTRP(1),FA(6)),(NCTALF(1),FA(7)),                  ##1A-FA#
                         * (NCTDPV(1),FA(8)),(NCTPC(1),FA(9)),(NCTBLE(1),FA(10)),            ##1A-FA#
                         * (CMPTBL(1),FA(11))
                     *CEND                                                                  DEVL END
                     *CALL COMCTL
                     C
   ISN 00014               COMMON /COMCTL/ COMDAT(30),FILID(30),FILSIZ(30),FILNDX(30),SAFE1
   ISN 00015               REAL*8          COMDAT                                         PACKWORD
   ISN 00016               INTEGER FILSIZ,FILNDX
   ISN 00017               LOGICAL NEWRST
   ISN 00018               EQUIVALENCE (SAFE1,NEWRST)
                     *CEND                                                                  DEVL END
                     *CALL FAST
                     C                                                                      LCM VERS
   ISN 00019               COMMON /FAST/ FA(100)                                          ION;DEFI
   ISN 00020               INTEGER LA(2,100)                                              NE SCOPE
   ISN 00021               EQUIVALENCE (FA(1),LA(1))                                      O#######
   ISN 00022               REAL*8 LFA(100)                                                #REAL*8#
   ISN 00023               INTEGER LLA(2,100)
   ISN 00024               EQUIVALENCE (LFA(1),LLA(1),FA(1))
                     *CEND                                                                  DEVL END
                     *CALL GENRL
                     C
                     C####  COMMON /GENRL/ CTITLE(10),FAIL,IROUTE,NCASE,PTITLE(7),         ########
   ISN 00025               COMMON /GENRL/ CTITLE(12),FAIL,IROUTE,NCASE,PTITLE(9),         CHARACTR
                         * UNITI,UNITO,SAFE3
                     C####  INTEGER CTITLE,PTITLE                                          ########
   ISN 00026               REAL*8  CTITLE,PTITLE                                          CHARACTR
   ISN 00027               REAL*8                        IROUTE                           PACKWORD
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   ISN 00028            LOGICAL FAIL,UNITI,UNITO
                      *CEND                                                                  DEVL END
                      *CALL JUNDAT
                      C
                      C  JUNCTION BLOCK
   ISN 00029            REAL*8AJUN(1),FIJ(1),FORMFJ(1),FORMGJ(1),FIJO(1),                    #REAL*8#
                       * RHOFJ(1),RHOGJ(1),UFJ(1),UGJ(1),VELFJ(1),
                       * VELGJ (1), VELJ  (1), VELFJO(1), VELGJO(1), VELJO (1), VOIDFJ(1),
                       * VOIDGJ(1), FJUNF (1), FJUNR (1), DIAMJ (1), ATHROT(1), VOIDD (1),
                       *  VOIDT(1),ARAT(2),FAAJ(1),MFLOWJ(1),CCAJ(1)
                      C####  INTEGER NJUNS(1),NJSKP(1),IJ1(1),IJ2(1),IMREG(1),JC(2),JUNNO(1), ########
                      C##### JUNFTL(1)                                                       ########
   ISN 00030            INTEGER NJUNS(2,1)                                                   INTEGER
   ISN 00031            INTEGER          NJSKP(2,1),                          JUNNO(2,1)INTEGER
   ISN 00032            REAL*8                    IJ1(1),IJ2(1),IMREG(1),JC(2),             PACKWORD
                       * JUNFTL(1)                                                          PACKWORD
                      C
   ISN 00033             EQUIVALENCE     ( NJUNS (1),FA( 1) )                              ##IA-FA#
   ISN 00034             EQUIVALENCE     ( NJSKP (1),FA( 2) )                              ##IA-FA#
   ISN 00035             EQUIVALENCE     ( IJ1   (1),FA( 3) )                              ##IA-FA#
   ISN 00036             EQUIVALENCE     ( IJ2   (1),FA( 4) )                              ##IA-FA#
   ISN 00037             EQUIVALENCE     ( AJUN  (1),FA( 5) )
   ISN 00038             EQUIVALENCE     ( FIJ   (1),FA( 6) )
   ISN 00039             EQUIVALENCE     ( FJUNF (1),FA( 7) )
   ISN 00040             EQUIVALENCE     ( FJUNR (1),FA( 8) )
   ISN 00041             EQUIVALENCE     ( FORMFJ(1),FA( 9) )
   ISN 00042             EQUIVALENCE     ( FORMGJ(1),FA(10) )
   ISN 00043            EQUIVALENCE (IMREG(1),FA(11))                                      ##IA-FA#
   ISN 00044            EQUIVALENCE (FIJO(1),FA(12))
   ISN 00045             EQUIVALENCE     ( RHOFJ (1),FA(13) )
   ISN 00046             EQUIVALENCE     ( RHOGJ (1),FA(14) )
   ISN 00047             EQUIVALENCE     ( UFJ   (1),FA(15) )
   ISN 00048             EQUIVALENCE     ( UGJ   (1),FA(16) )
   ISN 00049             EQUIVALENCE     ( VELFJ (1),FA(17) )
   ISN 00050             EQUIVALENCE     ( VELGJ (1),FA(18) )
   ISN 00051             EQUIVALENCE     ( VELJ  (1),FA(19) )
   ISN 00052             EQUIVALENCE     ( VELFJO(1),FA(20) )
   ISN 00053             EQUIVALENCE     ( VELGJO(1),FA(21) )
   ISN 00054             EQUIVALENCE     ( VELJO (1),FA(22) )
   ISN 00055             EQUIVALENCE     ( VOIDFJ(1),FA(23) )
   ISN 00056             EQUIVALENCE     ( VOIDGJ(1),FA(24) )
   ISN 00057             EQUIVALENCE     ( DIAMJ (1),FA(25) )
   ISN 00058             EQUIVALENCE     ( JC    (1),FA(26) )                              ##IA-FA#
                      C       JC USES TWO WORDS.
   ISN 00059             EQUIVALENCE     ( JUNNO (1),FA(28) )                              ##IA-FA#
   ISN 00060             EQUIVALENCE     ( ATHROT(1),FA(29) )
   ISN 00061             EQUIVALENCE     ( VOIDD (1),FA(30) )
   ISN 00062             EQUIVALENCE     ( VOIDT (1),FA(31) )
   ISN 00063             EQUIVALENCE     ( ARAT  (1),FA(32) )
                      C  ARAT USES TWO WORDS
   ISN 00064             EQUIVALENCE     ( FAAJ  (1),FA(34) )
   ISN 00065            EQUIVALENCE (MFLOWJ(1),FA(35))
   ISN 00066             EQUIVALENCE     ( CCAJ  (1), FA(36) )
   ISN 00067            EQUIVALENCE (JUNFTL(1),FA(37))                                     ##IA-FA#
                      *CEND                                                                DEVL END
                      *CALL RCOMPC
                      C
   ISN 00068            COMMON /RCOMPC/ IVSKP,IJSKP,NCOMP,CMPSRC,CMPFLG,RCOMPV
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   ISN 00069            LOGICAL CMPSRC,CMPFLG
                      *CEND                                                                DEVL END
                      C
   ISN 00070            COMMON /RBRNCC/ RBRNCV
                      *CALL VOLDAT
                      C
                      C  VOLUME BLOCK
   ISN 00071            REAL*8DIAMV(1),DMDP(1),DMDRU(1),DMDX(1),DOTM(1),DRDP(1),             #REAL*8#
                       * DRDRU(1),DRDX(1),
                       * P     (1), PD    (1), Q     (1), QUALE (1), QUALS (1), QUALSO(1),
                       * RHO   (1), RHOF  (1), RHOG  (1), RHOM  (1), RHOO  (1), U     (1),
                       * UE    (1), UG    (1), UO    (1), V     (1), VELF  (1), VELG  (1),
                       * VNEW  (1), VOIDF (1), VOIDG (1), TEMP  (1), ROUGHV(1), AVOL  (1),
                       * TEMPF(1),TEMPG(1),DZ(1),DL(1),SOUNDE(1),
                       * FWALF (1), FWALG (1), SATT  (1), SATVF (1), SATVG (1),
                       * SATHF(1), SATHG(1), SATCPF(1), SATCPG(1), CPSPH(1),
                       * FAAV(1),VISCF(1),VISCG(1),SIGMA(1),QUALA(1),QUALAO(1),
                       * ORDA(1),DMDA(1),BORON(1),BORONO(1),DOTMO(1)
                      C####  INTEGER NVOLS(1),NVSKP(11),VCTRL(1),VOLNO(1),IMAP(1)            ########
   ISN 00072            INTEGER NVOLS(2,1)                                                   INTEGER
   ISN 00073            INTEGER          NVSKP(2,11),        VOLNO(2,1)                      INTEGER
   ISN 00074            REAL*8                     VCTRL(1),          IMAP(1)               PACKWORD
                      C
   ISN 00075             EQUIVALENCE     ( NVOLS (1),FA( 1) )                              ##IA-FA#
   ISN 00076             EQUIVALENCE     ( NVSKP (1),FA( 2) )                              ##IA-FA#
   ISN 00077             EQUIVALENCE     ( ROUGHV(1),FA( 3) )
   ISN 00078             EQUIVALENCE     ( DIAMV (1),FA( 4) )
   ISN 00079             EQUIVALENCE     ( DMDP  (1),FA( 5) )
   ISN 00080             EQUIVALENCE     ( DMDRU (1),FA( 6) )
   ISN 00081             EQUIVALENCE     ( DMDX  (1),FA( 7) )
   ISN 00082             EQUIVALENCE     ( DOTM  (1),FA( 8) )
   ISN 00083             EQUIVALENCE     ( SOUNDE(1),FA( 9) )
   ISN 00084             EQUIVALENCE     ( VCTRL (1),FA(10) )                              ##IA-FA#
   ISN 00085             EQUIVALENCE     ( DRDP  (1),FA(11) )
   ISN 00086             EQUIVALENCE     ( DRDRU (1),FA(12) )
   ISN 00087             EQUIVALENCE     ( DRDX  (1),FA(13) )
   ISN 00088             EQUIVALENCE     ( VOLNO (1),FA(14) )                              ##IA-FA#
   ISN 00089             EQUIVALENCE     ( P     (1),FA(15) )
   ISN 00090             EQUIVALENCE     ( QUALS (1),FA(16) )
   ISN 00091             EQUIVALENCE     ( U     (1),FA(17) )
   ISN 00092             EQUIVALENCE     ( TEMP  (1),FA(18) )
   ISN 00093             EQUIVALENCE     ( RHO   (1),FA(19) )
   ISN 00094             EQUIVALENCE     ( PD    (1),FA(20) )
   ISN 00095             EQUIVALENCE     ( QUALSO(1),FA(21) )
   ISN 00096             EQUIVALENCE     ( UO    (1),FA(22) )
   ISN 00097             EQUIVALENCE     ( RHOO  (1),FA(23) )
   ISN 00098             EQUIVALENCE     ( RHOM  (1),FA(24) )
   ISN 00099             EQUIVALENCE     ( QUALE (1),FA(25) )
   ISN 00100             EQUIVALENCE     ( RHOF  (1),FA(26) )
   ISN 00101             EQUIVALENCE     ( RHOG  (1),FA(27) )
   ISN 00102             EQUIVALENCE     ( UF    (1),FA(28) )
   ISN 00103             EQUIVALENCE     ( UG    (1),FA(29) )
   ISN 00104             EQUIVALENCE     ( V     (1),FA(30) )
   ISN 00105             EQUIVALENCE     ( VNEW  (1),FA(31) )
   ISN 00106             EQUIVALENCE     ( VELF  (1),FA(32) )
   ISN 00107             EQUIVALENCE     ( VELG  (1),FA(33) )
   ISN 00108             EQUIVALENCE     ( VOIDF (1),FA(34) )
   ISN 00109             EQUIVALENCE     ( VOIDG (1),FA(35) )
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   ISN 00110              EQUIVALENCE     ( AVOL  (1),FA(36) )
   ISN 00111              EQUIVALENCE     ( TEMPF (1),FA(37) )
   ISN 00112              EQUIVALENCE     ( TEMPG (1),FA(38) )
   ISN 00113              EQUIVALENCE     ( DZ     (1),FA(39) )
   ISN 00114              EQUIVALENCE     ( DL     (1),FA(40) )
   ISN 00115              EQUIVALENCE     ( Q      (1),FA(41) )
   ISN 00116             EQUIVALENCE (IMAP(1),FA(42))                                  **IA-FA*
   ISN 00117              EQUIVALENCE     ( FWALF (1), FA(43) )
   ISN 00118              EQUIVALENCE     ( FWALG (1), FA(44) )
   ISN 00119              EQUIVALENCE     ( SATT   (1),FA(45) )
   ISN 00120              EQUIVALENCE     ( SATVF (1),FA(46) )
   ISN 00121              EQUIVALENCE     ( SATVG (1),FA(47) )
   ISN 00122              EQUIVALENCE     ( SATHF (1),FA(48) )
   ISN 00123              EQUIVALENCE     ( SATHG (1),FA(49) )
   ISN 00124              EQUIVALENCE     ( SATCPF(1),FA(50) )
   ISN 00125              EQUIVALENCE     ( SATCPG(1),FA(51) )
   ISN 00126              EQUIVALENCE     ( CPSPH (1),FA(52) )
   ISN 00127              EQUIVALENCE      ( FAAV  (1),FA(53) )
   ISN 00128              EQUIVALENCE     ( VISCF (1),FA(54) )
   ISN 00129              EQUIVALENCE     ( VISCG (1),FA(55) )
   ISN 00130              EQUIVALENCE     ( SIGMA (1),FA(56) )
   ISN 00131              EQUIVALENCE     ( QUALA (1), FA(57) )
   ISN 00132              EQUIVALENCE     ( QUALAO(1), FA(58) )
   ISN 00133              EQUIVALENCE     ( DRDA   (1), FA(59) )
   ISN 00134              EQUIVALENCE     ( DMDA   (1), FA(60) )
   ISN 00135              EQUIVALENCE     (BORON(1)   , FA(61)   )
   ISN 00136              EQUIVALENCE     (BORONO(1)  , FA(62)   )
   ISN 00137              EQUIVALENCE     (DOTMO(1)   , FA(63) )
                   C  ADDITIONAL VARIBLES FOR TIME DEPENDENT VOLUMES.
   ISN 00138             REAL*8DP(1), DPO(1)                                           *REAL*8*
   ISN 00139             EQUIVALENCE  (DP(1),DMOX(1)), (DPO(1),DOTM(1))
                   *CEND                                                               DEVL END
   ISN 00140            COMMON/JPDATA/NJP,NOCOM(4),DIA(7,4),RLENG(5,4),RAMDA(6,4),DUMYYY  JETPMP  1830 ジェットポンプデータを最大4個
                   C                                                                                    Store する, Sub.JETP には
                   C  LOCAL VARIABLES                                                                   COMMON /JPUMP/ を介して渡される.
                   C*       INTEGER L3A(8),L3B(15),L3C(10),L3D(12),L3E(9),INIT(9),OUTPUT
   ISN 00141             INTEGER L3A(8),L3B(15),L3C(10),L3D(12),L3E(9),INIT(2,9),OUTPUT  *JA
                   C***  INTEGER LABL1(2),LABL2(2),LABL3(2)                                ********
   ISN 00142             REAL*16 LABL1(2),LABL2(2),LABL3(2)                                CHARACTR
                   C*       REAL XINIT(9),FR(4)
   ISN 00143             REAL*8 XINIT(9),FR(4)                                             *JA
   ISN 00144             EQUIVALENCE (INIT(1),XINIT(1))
   ISN 00145             LOGICAL TFAIL,OVL
   ISN 00146             INTEGER L3F(13)                                                   JETPMP
   ISN 00147             INTEGER L3G(11)                                                   JETPMP
   ISN 00148             INTEGER L3H(12)                                                   JETPMP
   ISN 00149             INTEGER L3I( 7)                                                   JETPMP
                   C
                   C  DATA STATEMENTS
   ISN 00150             DATA L3A/2*0,1,2,0,1,0,0/
   ISN 00151             DATA L3B/2*0,2*9,0,1,8*1,0/
   ISN 00152            DATA L3C/2*0,3,6,0,1,0,2,1,1/
   ISN 00153             DATA L3D/2*0,2*6,0,1,0,0,1,1,1,0/
   ISN 00154             DATA L3E/2*0,2*3,0,1,3*1/
   ISN 00155             DATA L3F/2*0,7,7,0,1,7*1/                                         JETPMP
   ISN 00156             DATA L3G/2*0,5,5,0,1,5*1/                                         JETPMP
   ISN 00157             DATA L3H/2*0,0,6,0,1,6*1/                                         JETPMP
   ISN 00158             DATA L3I/2*0,0,1,0,1,0  /                                         JETPMP
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                   CYIF DEF,SCOPEO,1                                                   *IGNORED
   ISN 00159             DATA IU/3/, IUD/1/                                                 SCOPED
                   C*       DATA FT/0.3048/, FT2/9.290304E-2/, FT3/2.831685E-2/,
                   C*     * ENG/2.326E3/, PSIA/6.894757E3/, DEGF1/0.5555555555555/,
                   C*     * DEGF2/255.3722222222/, XLBSEC/.45359237/, TT/300.0/,
                   C*     * PI/3.141592653589/
   ISN 00160             DATA FT/0.304800/, FT2/9.2903040-2/, FT3/2.8316850-2/,        *JA
                        &   ENG/2.32603/, PSIA/6.89475703/, DEGF1/0.555555555555500/,  *JA
                        &      DEGF2/255.372222222200/, XLBSEC/.4535923700/, TT/300.000/,  *JA
                        &              PI/3.14159265358900/                            *JA
                   C&       DATA OUTPUT/6LOUTPUT/
   ISN 00161             DATA OUTPUT/6        /                                        &JA
   ISN 00162             DATA LABL1/' VEL.',' FLOW'/, LABL2/'(FT/SEC)','(LBM/SEC)'/,
                       * LABL3/'(M/SEC)','(KG/SEC)'/
                   C
                   C  SET END OF CODE FOR FTB
   ISN 00163             CALL FTBORG (RBRNCV)
                   C
                   C  GET COMPONENT NUMBER
   ISN 00164             OVL = .FALSE.
                   CY       I = NCMPS(FILNDX(3)) + FILNDX(3)
   ISN 00165             I = ID18(NCMPS(FILNDX(3)))+FILNDX(3)                              ***
                   CY       NC = .NOT.MASK(30) .AND. CMPNUM(I)
   ISN 00166             NC = IDAND(DNOT(DMASK(30)),CMPNUM(I))                             YJA
                   C  EXTEND COMPONENT BLOCK
   ISN 00167             FILSIZ(3) = FILSIZ(3) + 5
   ISN 00168             L3A(1) = FILSIZ(3)
   ISN 00169             IF (.NOT.CMPSRC) L3A(1) = L3A(1) + 5
   ISN 00170             IF (LCNTGS(FILID(3),1) .GE. L3A(1)) GO TO 10
   ISN 00171         15  WRITE (OUTPUT,2001) NC
   ISN 00172       2001  FORMAT ('0******** INSUFFICIENT SCM STORAGE TO PROCESS COMPONENT'
                       *  I4,'.')
   ISN 00173         12  L3C(1) = NC*10000
   ISN 00174             L3C(2) = L3C(1) + 9999
                   CX       FILSIZ(1) = INP10(IA(FILNDX(1)),L3C(1),L3C(2))
   ISN 00175             FILSIZ(1) = INP10(IA(1,FILNDX(1)),L3C(1),L3C(2))                  ***
                   CX       CALL FTBSFT (2.0,FILSIZ(1),1,FILNDX(1))
   ISN 00176             CALL FTBSFT (2.000,FILSIZ(1),1,FILNDX(1))                         XJA
   ISN 00177        204  FILSIZ(3) = FILSIZ(3) - 2
                   CX       CMPNUM(I) = SHIFT(3,30) .OR. NC
   ISN 00178             CMPNUM(I) = DOR(SHIFTI(3,30),DBIT(NC))                            XJA
   ISN 00179             CALL FTBSFT (FILID(3),FILSIZ(3),1,FILNDX(3))
                   CY       NCMPS(FILNDX(3)) = NCMPS(FILNDX(3)) + 3
   ISN 00180             NCMPS(FILNDX(3)) = DADD(NCMPS(FILNDX(3)),DBIT(3))                 YJA
   ISN 00181             FAIL = .TRUE.
   ISN 00182             GO TO 1000
   ISN 00183         10  CALL FTBSFT (FILID(3),L3A(1),1,FILNDX(3))
                   CY       I = NCMPS(FILNDX(3)) + FILNDX(3)
   ISN 00184             I = ID18(NCMPS(FILNDX(3)))+FILNDX(3)                              ***
                   CY       CMPNUM(I) = SHIFT(5,30) .OR. CMPNUM(I)
   ISN 00185             CMPNUM(I) = DOR(SHIFTI(5,30),CMPNUM(I))                           YJA
                   C  GET NUMBER OF JUNCTIONS IN BRANCH OR SEPARATOR.
   ISN 00186             L3A(1) = NC*10000 + 1
   ISN 00187             L3A(6) = 1
                   CX       CALL INP2 (IA(FILNDX(1)),INIT,L3A,FA)
   ISN 00188             CALL INP2 (IA(1,FILNDX(1)),INIT,L3A,FA)                           XJA
   ISN 00189             IF (L3A(6) .GT. 0) GO TO 69
   ISN 00190        408  WRITE (OUTPUT,2002) NC
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    ISN 00191       2002  FORMAT ('0******** DATA FOR COMPONENT'I4,' CANNOT BE PROCESSED.')
    ISN 00192             GO TO 12
    ISN 00193         69  IXP = 0
    ISN 00194             IF (L3A(6) .EQ. 1) GO TO 11
                   CX     IXP = INIT(2)
    ISN 00195             IXP = INIT(2,2)                                                         XJA
    ISN 00196             IF (IXP.EQ.0 .OR. IXP.EQ.1) GO TO 11
    ISN 00197             WRITE (OUTPUT,2027)
    ISN 00198       2027  FORMAT ('0******** CONTROL FOR JUNCTION INITIAL CONDITIONS INCORR
                         *ECT, SET TO 0 FOR CONTINUED CHECKING.')
    ISN 00199             FAIL = .TRUE.
    ISN 00200             IXP = 0
                   CX 11  NJ = INIT(1)
    ISN 00201         11  NJ = INIT(2,1)                                                          XJA
    ISN 00202             IF((NJ .GE. 0) .AND. (NJ .LT. 10)) GO TO 13
    ISN 00203             WRITE (OUTPUT,2003) L3A(1)
    ISN 00204       2003  FORMAT ('0******** NUMBER OF JUNCTIONS SPECIFIED ON CARD'I8,
                         * ' IS OUT OF RANGE.')
    ISN 00205             GO TO 12
                   CX 13  NVC(I) = 1
    ISN 00206         13  NVC(I) = DBIT(1)                                                        XJA
                   CX     NJC(I) = NJ
    ISN 00207             NJC(I) = DBIT(NJ)                                                       XJA
                   CX     IF (IXP .NE. 0) NJC(I) = MASK(1) .OR. NJC(I)
    ISN 00208             IF (IXP .NE. 0) NJC(I) = DOR(DMASK(1),NJC(I))                           XJA
                   C  CHECK IF REPLACEMENT OR FLAG MODIFICATION IS POSSIBLE.
    ISN 00209             IF (CMPSRC) GO TO 401
    ISN 00210             II = FILNDX(3) + 1
    ISN 00211             NNV = NCOMP - 1
    ISN 00212             IF (NNV .EQ. 0) GO TO 407
    ISN 00213             NV1 = 0
    ISN 00214             NJ1 = 0
    ISN 00215             DO 402 K = 1,NNV
                   CX       NV10 = .NOT.MASK(48) .AND. NVC(II)
    ISN 00216               NV10 = IDAND(DNOT(DMASK(48)),NVC(II))                                 XJA
                   CX       NJ10 = .NOT.MASK(48) .AND. NJC(II)
    ISN 00217               NJ10 = IDAND(DNOT(DMASK(48)),NJC(II))                                 XJA
                   CX       NC1 = .NOT.MASK(42) .AND. SHIFT(CMPNUM(II),30)
    ISN 00218               NC1 = IDAND(DNOT(DMASK(42)),SHIFT(CMPNUM(II),30))                     XJA
                   CX       IF ((.NOT.MASK(30).AND.CMPNUM(II)) - NC) 403,404,405
    ISN 00219               IF (IDAND(DNOT(DMASK(30)),CMPNUM(II))-NC) 403,404,405                 XJA
    ISN 00220        403    NV1 = NV1 + NV10
    ISN 00221               NJ1 = NJ1 + NJ10
    ISN 00222               II = II + NC1
    ISN 00223        402  CONTINUE
    ISN 00224        407  CMPSRC = .TRUE.
    ISN 00225             GO TO 401
    ISN 00226        404  NCOMP = NNV
    ISN 00227             IF (CMPTYP(II) .NE. CMPTYP(I)) GO TO 406
                   CX     IF (NJC(II) .NE. NJC(I)) GO TO 406
    ISN 00228             IF (LNE(NJC(II),NJC(I))) GO TO 406                                      XJA
    ISN 00229             OVL = .TRUE.
    ISN 00230             GO TO 14
    ISN 00231        405  NV10 = 0
    ISN 00232             NJ10 = 0
    ISN 00233             NC1 = 0
    ISN 00234        406  IF (.NOT.CMPFLG) GO TO 14
    ISN 00235        409  WRITE (OUTPUT,2035) NC
```

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    ISN 00236       2035  FORMAT ('0******** ILLEGAL USE OF COMPONENT FLAG CHANGE OPTION IN
                         * COMPONENT'I4,'.')
    ISN 00237             GO TO 408
                   C  BRING VOLUME AND JUNCTION BLOCKS FROM LCM AND EXTEND THEM FOR THIS
                   C  COMPONENT.  CREATE THEM IF THEY DO NOT EXIST.
    ISN 00238        401  IF (CMPFLG) GO TO 409
    ISN 00239             IF (FILSIZ(4) .NE. 0) GO TO 14
    ISN 00240             K = IVSKP + 2
    ISN 00241             IF (K .GT. LCONTG(1)) GO TO 15
                   CXIF DEF,SCOPE3,1                                                                *IGNORED
                   C      CALL FTBRSV (-FILID(4),K,-1,L)                                            *IGNORED
                   CXIF DEF,SCOPE0,1                                                                *IGNORED
    ISN 00242             CALL FTBRSV (FILID(4),K,-1,L)                                               SCOPE0
                   CX     NVOLS(L) = 1
    ISN 00243             NVOLS(2,L) = 1                                                          XJA
    ISN 00244             IV = L
                   CX     NVSKP(L) = IVSKP
    ISN 00245             NVSKP(2,L) = IVSKP                                                      XJA
    ISN 00246             GO TO 16
    ISN 00247         14  IF (CMPSRC) NV10 = 0
    ISN 00248             K2 = 1 - NV10
    ISN 00249             K = FILSIZ(4) + K2*IVSKP
    ISN 00250             K1 = MAX0(FILSIZ(4),K)
    ISN 00251             IF (K1 .GT. LCONTG(1)) GO TO 15
                   CXIF DEF,SCOPE3,3                                                                *IGNORED
                   C      CALL FTBRSV (-FILID(4),K1,-1,L)                                           *IGNORED
                   C      CALL READEC (FA(L),LFA(FILNDX(4)),FILSIZ(4))                              *IGNORED
                   C      CALL DELETE (FILID(4))                                                    *IGNORED
                   CXIF DEF,SCOPE0,4                                                                *IGNORED
    ISN 00252             CALL FTBRSV (FILID(4),K1,-1,L)                                              SCOPE0
    ISN 00253             CALL FTBIN (IUD,FA(L),FILSIZ(4),FILNDX(4))                                  SCOPE0
    ISN 00254             CALL DELETE (-FILID(4))                                                     SCOPE0
    ISN 00255             CALL FTBCHK (IUD)                                                           SCOPE0
                   CX     IF (CMPSRC) NV1 = NVOLS(L)
    ISN 00256             IF (CMPSRC) NV1 = NVOLS(2,L)                                            XJA
    ISN 00257             IV = NV1*IVSKP + L
                   CX     K1 = (NVOLS(L) - NV1 - NV10)*IVSKP
    ISN 00258             K1 = (NVOLS(2,L) - NV1 - NV10)*IVSKP                                    XJA
    ISN 00259             IF (K1 .EQ. 0) GO TO 411
    ISN 00260             N3 = IV + NV10*IVSKP
    ISN 00261             N4 = IV + IVSKP
    ISN 00262             IF (N3 - N4) 412,411,413
    ISN 00263        412  K1 = -K1
    ISN 00264        413  CALL MOVE (ROUGHV(N3),ROUGHV(N4),K1)
                   CXIF DEF,SCOPE3,1                                                                *IGNORED
                   C 411  IF (K .LT. FILSIZ(4)) CALL FTBSFT (-FILID(4),K,3,L)                       *IGNORED
                   CXIF DEF,SCOPE0,1                                                                *IGNORED
    ISN 00265        411  IF (K .LT. FILSIZ(4)) CALL FTBSFT (FILID(4),K,3,L)                          SCOPE0
                   CX     NVOLS(L) = NVOLS(L) + K2
    ISN 00266             NVOLS(2,L) = NVOLS(2,L) + K2                                            XJA
    ISN 00267         16  FILSIZ(4) = K
    ISN 00268             FILNDX(4) = L
                   C  SET STORAGE FOR NEW VOLUMES.
    ISN 00269             IF (.NOT.OVL) CALL SETNDF (ROUGHV(IV),IVSKP)
    ISN 00270             IF (CMPFLG) GO TO 450
                   CX     VCTRL(IV) = SHIFT(MASK(1),59)
    ISN 00271             VCTRL(IV) = SHIFT(DMASK(1),59)                                          XJA
                   C  GET JUNCTION BLOCK
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 ISN 00272        450  NJS = NJ+IJSKP
 ISN 00273             IF (FILSIZ(5) .NE. 0) GO TO 18
 ISN 00274             K = NJS + 2
 ISN 00275             IF (K .GT. LCONTG(1)) GO TO 15
               CVIF DEF,SCOPE3,1                                                          *IGNORED
               C       CALL FTBRSV (-FILID(5),K,-1,J)                                     *IGNORED
               CVIF DEF,SCOPEO,1                                                          *IGNORED
 ISN 00276             CALL FTBRSV (FILID(5),K,-1,J)                                      SCOPEO
               CX      NJUNS(J) = NJ
 ISN 00277             NJUNS(2,J) = NJ                                                    XJA
 ISN 00278             IJ = J
               CX      NJSKP(J) = IJSKP
 ISN 00279             NJSKP(2,J) = IJSKP                                                 XJA
 ISN 00280             GO TO 19
 ISN 00281        18   IF (CMPSRC) NJ10 = 0
 ISN 00282             K2 = NJ - NJ10
 ISN 00283             K = FILSIZ(5) + K2+IJSKP
 ISN 00284             K1 = MAXO(FILSIZ(5),K)
 ISN 00285             IF (K1 .GT. LCONTG(1)) GO TO 15
               CVIF DEF,SCOPE3,3                                                          *IGNORED
               C       CALL FTBRSV (-FILID(5),K1,-1,J)                                    *IGNORED
               C       CALL READEC (FA(J),LFA(FILNDX(5)),FILSIZ(5))                       *IGNORED
               C       CALL DELETE (FILID(5))                                             *IGNORED
               CVIF DEF,SCOPEO,4                                                          *IGNORED
 ISN 00286             CALL FTBRSV (FILID(5),K1,-1,J)                                     SCOPEO
 ISN 00287             CALL FTBIN (IUD,FA(J),FILSIZ(5),FILNDX(5))                         SCOPEO
 ISN 00288             CALL DELETE (-FILID(5))                                            SCOPEO
 ISN 00289             CALL FTBCHK (IUD)                                                  SCOPEO
               CX      IF (CMPSRC) NJ1 = NJUNS(J)
 ISN 00290             IF (CMPSRC) NJ1 = NJUNS(2,J)                                       XJA
 ISN 00291             IJ = NJ1+IJSKP + J
               CX      K1 = (NJUNS(J) - NJ1 - NJ10)+IJSKP
 ISN 00292             K1 = (NJUNS(2,J) - NJ1 - NJ10)+IJSKP                               XJA
 ISN 00293             IF (K1 .EQ. 0) GO TO 421
 ISN 00294             N3 = IJ + NJ10+IJSKP
 ISN 00295             N4 = IJ + NJS
 ISN 00296             IF (N3 - N4) 422,421,423
 ISN 00297        422  K1 = -K1
 ISN 00298        423  CALL MOVE (IJ1(N3),IJ1(N4),K1)
               CVIF DEF,SCOPE3,1                                                          *IGNORED
               C 421   IF (K .LT. FILSIZ(5)) CALL FTBSFT (-FILID(5),K,3,J)                *IGNORED
               CVIF DEF,SCOPEO,1                                                          *IGNORED
 ISN 00299        421  IF (K .LT. FILSIZ(5)) CALL FTBSFT (FILID(5),K,3,J)                SCOPEO
               CX      NJUNS(J) = NJUNS(J) + K2
 ISN 00300             NJUNS(2,J) = NJUNS(2,J) + K2                                       XJA
 ISN 00301        19   FILSIZ(5) = K
 ISN 00302             FILNDX(5) = J
 ISN 00303             IF (NJ .EQ. 0) GO TO 430
 ISN 00304             IJE = IJ + NJS - 1
 ISN 00305             IF (.NOT.OVL) CALL SETNDF(IJ1(IJ),NJS)
 ISN 00306             IF (CMPFLG) GO TO 430
 ISN 00307             DO 431 K = IJ,IJE,IJSKP
               CV        JC(K) = 0
 ISN 00308               JC(K) = DBIT(0)                                                  XJA
               CV        JC(K+1) = SHIFT(MASK(1),58)
 ISN 00309               JC(K+1) = SHIFT(DMASK(1),58)                                     XJA
               CX        ATHROT(K) = 1.0
 ISN 00310               ATHROT(K) = 1.000                                                XJA


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 ISN 00311        431  CONTINUE
               C  INSERT NEW COMPONENT IN PROPER PLACE IN COMPONENT BLOCK IF NECESSARY.
 ISN 00312        430  IF (CMPSRC) GO TO 431
 ISN 00313             K2 = 5 - NC1
 ISN 00314             N3 = II + NC1
 ISN 00315             N4 = II + 5
 ISN 00316             K1 = I + 5 - N3
 ISN 00317             IF (K2) 433,432,434
 ISN 00318        434  K1 = -K1
 ISN 00319        433  CALL MOVE (CMPNUM(N3),CMPNUM(N4),K1)
 ISN 00320             I = I + K2
 ISN 00321        432  CALL MOVE (CMPNUM(1),CMPNUM(II),5)
 ISN 00322             I = II
               CX      NCMPS(FILNDX(3)) = NCMPS(FILNDX(3)) + K2
 ISN 00323             NCMPS(FILNDX(3)) = DADD(NCMPS(FILNDX(3)),DBIT(K2))               XJA
 ISN 00324             FILSIZ(3) = FILSIZ(3) + K2 - 5
 ISN 00325             CALL FTBSFT (FILID(3),FILSIZ(3),5,FILNDX(3))
 ISN 00326             GO TO 17
               CX431   NCMPS(FILNDX(3)) = NCMPS(FILNDX(3)) + 5
 ISN 00327        431  NCMPS(FILNDX(3)) = DADD(NCMPS(FILNDX(3)),DBIT(5))               XJA
               C  WRITE OUTPUT HEADER FOR COMPONENT
 ISN 00328         17  IF (LINES(1) .LT. 5) WRITE (OUTPUT,2100)
 ISN 00329       2100  FORMAT ('1')
 ISN 00330             WRITE (OUTPUT,2101) NC,CMPNAM(I),CMPTYP(I),NJ
 ISN 00331       2101  FORMAT ('0'22X'INPUT DATA FOR COMPONENT'14,','2A11,', HAVING  1 V
                     *OLUMES AND'I3,' JUNCTIONS')
               C  PROCESS VOLUME GEOMETRY INPUT
 ISN 00332             IF (UNITI) GO TO 20
 ISN 00333             FR(1) = FT
 ISN 00334             FR(2) = FT2
 ISN 00335             FR(3) = FT3
 ISN 00336             GO TO 21
               CX 20   FR(1) = 1.0
 ISN 00337        20   FR(1) = 1.000                                                    XJA
               CX      FR(2) = 1.0
 ISN 00338             FR(2) = 1.000                                                    XJA
               CX      FR(3) = 1.0
 ISN 00339             FR(3) = 1.000                                                    XJA
 ISN 00340        21   L3B(1) = NC*10000 + 101
 ISN 00341             L3B(2) = -L3B(1) - 8
 ISN 00342             L3B(6) = 1
               CX      CALL INP2 (IA(FILNDX(1)),INIT,L3B,FA)
 ISN 00343             CALL INP2 (IA(1,FILNDX(1)),INIT,L3B,FA)                          XJA
 ISN 00344             IF (L3B(6) .GT. 0) GO TO 22
 ISN 00345             WRITE (OUTPUT,2007)
 ISN 00346       2007  FORMAT ('0********* VOLUME GEOMETRY CONDITIONS SET TO DEFAULT VALU
                     *ES FOR CONTINUED CHECKING.')
 ISN 00347             IF (CMPFLG) GO TO 453
               CX      AVOL(IV) = 1.0
 ISN 00348             AVOL(IV) = 1.000                                                 XJA
               CX      DL(IV) = 1.0
 ISN 00349             DL(IV) = 1.000                                                   XJA
               CX      V(IV) = 1.0
 ISN 00350             V(IV) = 1.000                                                    XJA
               CX      RHOF(IV) = 0.0
 ISN 00351             RHOF(IV) = 0.000                                                 XJA
               CX      RHO(IV) = 0.0
 ISN 00352             RHO(IV) = 0.000                                                  XJA
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              CX      DZ(IV) = 0.0
   ISN 00353          DZ(IV) = 0.000                                                          XJA
              CX      ROUGHV(IV) = 0.0
   ISN 00354          ROUGHV(IV) = 0.000                                                      XJA
              CX      DIAMV(IV) = 2.0*SQRT(AVOL(IV)/PI)
   ISN 00355          DIAMV(IV) = 2.000*DSQRT(AVOL(IV)/PI)                                    XJA
   ISN 00356      453 FAIL = .TRUE.
   ISN 00357          GO TO 115
   ISN 00358       22 IF (CMPFLG) GO TO 34
   ISN 00359          AVOL(IV) = XINIT(1)*FR(2)
              CX      IF (AVOL(IV) .GE. 0.0) GO TO 23
   ISN 00360          IF (AVOL(IV) .GE. 0.000) GO TO 23                                       XJA
              CX      AVOL(IV) = 1.0
   ISN 00361          AVOL(IV) = 1.000                                                        XJA
   ISN 00362          WRITE (OUTPUT,2005)
   ISN 00363     2005 FORMAT ('0********* VOLUME AREA LESS THAN 0.0, SET TO 1.0 FOR CONT
                     *INUED CHECKING.')
   ISN 00364          FAIL = .TRUE.
   ISN 00365       23 DL(IV) = XINIT(2)*FR(1)
              CX      IF (DL(IV) .GE. 0.0) GO TO 24
   ISN 00366          IF (DL(IV) .GE. 0.000) GO TO 24                                         XJA
              CX      DL(IV) = 1.0
   ISN 00367          DL(IV) = 1.000                                                          XJA
   ISN 00368          WRITE (OUTPUT,2009)
   ISN 00369     2009 FORMAT ('0********* VOLUME LENGTH LESS THAN 0.0, SET TO 1.0 FOR CO
                     *NTINUED CHECKING.')
   ISN 00370          FAIL = .TRUE.
   ISN 00371       24 V(IV) = XINIT(3)*FR(3)
              CX      IF (V(IV) .GE. 0.0) GO TO 26
   ISN 00372          IF (V(IV) .GE. 0.000) GO TO 26                                          XJA
   ISN 00373          WRITE (OUTPUT,2011)
   ISN 00374     2011 FORMAT ('0********* VOLUME VOLUME LESS THAN 0.0, SET TO 1.0 FOR CO
                     *NTINUED CHECKING.')
   ISN 00375          FAIL = .TRUE.
              CX      V(IV) = 1.0
   ISN 00376          V(IV) = 1.000                                                           XJA
              C  APPLY DEFAULTS TO VOLUME AREA, LENGTH, AND VOLUME.
   ISN 00377       26 TFAIL = .FALSE.
              CX      IF (V(IV) .NE. 0.0) GO TO 60
   ISN 00378          IF (V(IV) .NE. 0.000) GO TO 60                                          XJA
   ISN 00379          V(IV) = AVOL(IV)*DL(IV)
              CX      IF (V(IV) .NE. 0.0) GO TO 27
   ISN 00380          IF (V(IV) .NE. 0.000) GO TO 27                                          XJA
   ISN 00381          TFAIL = .TRUE.
              CX      V(IV) = 1.0
   ISN 00382          V(IV) = 1.000                                                           XJA
              CX 60   IF (AVOL(IV) .NE. 0.0) GO TO 61
   ISN 00383       60 IF (AVOL(IV) .NE. 0.000) GO TO 61                                       XJA
              CX      IF (DL(IV) .EQ. 0.0) GO TO 62
   ISN 00384          IF (DL(IV) .EQ. 0.000) GO TO 62                                         XJA
   ISN 00385          AVOL(IV) = V(IV)/DL(IV)
   ISN 00386          GO TO 65
   ISN 00387       62 TFAIL = .TRUE.
              CX      AVOL(IV) = 1.0
   ISN 00388          AVOL(IV) = 1.000                                                        XJA
              CX 61   IF (DL(IV) .NE. 0.0) GO TO 63
   ISN 00389       61 IF (DL(IV) .NE. 0.000) GO TO 63                                         XJA
   ISN 00390          DL(IV) = V(IV)/AVOL(IV)


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   ISN 00391          GO TO 65
              CX 63   IF (ABS(AVOL(IV)*DL(IV)-V(IV))/V(IV) .LE. 0.000001) GO TO 65
   ISN 00392       63 IF (DABS(AVOL(IV)*DL(IV)-V(IV))/V(IV) .LE. 0.000001D0) GO TO 65      XJA
   ISN 00393          WRITE (OUTPUT,2031)
   ISN 00394     2031 FORMAT ('0********* VOLUME IS NOT EQUAL TO AREA TIMES LENGTH.')
   ISN 00395          GO TO 64
   ISN 00396       65 IF (.NOT.TFAIL) GO TO 27
   ISN 00397          WRITE (OUTPUT,2030)
   ISN 00398     2030 FORMAT ('0********* ONLY ONE OF THE VOLUME AREA, LENGTH, OR VOLUME
                     * MAY BE 0.0, DEFAULT VALUES USED.')
   ISN 00399       64 FAIL = .TRUE.
   ISN 00400       27 RHOF(IV) = XINIT(4)
              CX      IF (ABS(RHOF(IV)) .LE. 360.0) GO TO 28
   ISN 00401          IF (DABS(RHOF(IV)) .LE. 360.000) GO TO 28                               XJA
              CX      RHOF(IV) = 0.0
   ISN 00402          RHOF(IV) = 0.000                                                        XJA
   ISN 00403          WRITE (OUTPUT,2012)
   ISN 00404     2012 FORMAT ('0********* HORIZONTAL ANGLE INCORRECT, SET TO 0.0 FOR CON
                     *TINUED CHECKING.')
   ISN 00405          FAIL = .TRUE.
   ISN 00406       28 RHO(IV) = XINIT(5)
              CX      IF (RHO(IV).GE.-90.0 .AND. RHO(IV).LE.90.0) GO TO 29
   ISN 00407          IF (RHO(IV).GE.-90.000 .AND. RHO(IV).LE.90.000) GO TO 29                XJA
              CX      RHO(IV) = 0.0
   ISN 00408          RHO(IV) = 0.000                                                         XJA
   ISN 00409          WRITE (OUTPUT,2013)
   ISN 00410     2013 FORMAT ('0********* VERTICAL ANGLE INCORRECT, SET TO 0.0 FOR CONTI
                     *NUED CHECKING.')
   ISN 00411          FAIL = .TRUE.
   ISN 00412       29 DZ(IV) = XINIT(6)*FR(1)
              CX      IF (RHO(IV) .NE. 0.0) GO TO 56
   ISN 00413          IF (RHO(IV) .NE. 0.000) GO TO 56                                        XJA
              CX      IF (DZ(IV) .EQ. 0.0) GO TO 73
   ISN 00414          IF (DZ(IV) .EQ. 0.000) GO TO 73                                         XJA
   ISN 00415          GO TO 74
              CX 56   IF (DZ(IV) .EQ. 0.0) GO TO 74
   ISN 00416       56 IF (DZ(IV) .EQ. 0.000) GO TO 74                                         XJA
              CX      IF (RHO(IV)*DZ(IV) .GE. 0.0) GO TO 73
   ISN 00417          IF (RHO(IV)*DZ(IV) .GE. 0.000) GO TO 73                                 XJA
   ISN 00418       74 WRITE (OUTPUT,2033)
   ISN 00419     2033 FORMAT ('0********* VOLUME VERTICAL ANGLE INCONSISTENT WITH VERTIC
                     *AL INCREMENTAL HEIGHT.')
   ISN 00420          FAIL = .TRUE.
              CX 73   IF (ABS(DZ(IV)) .LE. DL(IV)) GO TO 30
   ISN 00421       73 IF (DABS(DZ(IV)) .LE. DL(IV)) GO TO 30                                  XJA
              CX      DZ(IV) = 0.0
   ISN 00422          DZ(IV) = 0.000                                                          XJA
   ISN 00423          WRITE (OUTPUT,2015)
   ISN 00424     2015 FORMAT ('0********* VOLUME INCREMENTAL HEIGHT GREATER THAN VOLUME
                     *LENGTH, SET TO 0.0 FOR CONTINUED CHECKING.')
   ISN 00425          FAIL = .TRUE.
   ISN 00426       30 ROUGHV(IV) = XINIT(7)*FR(1)
              CX      IF (ROUGHV(IV) .GE. 0.0) GO TO 31
   ISN 00427          IF (ROUGHV(IV) .GE. 0.000) GO TO 31                                     XJA
              CX      ROUGHV(IV) = 0.0
   ISN 00428          ROUGHV(IV) = 0.000                                                      XJA
   ISN 00429          WRITE (OUTPUT,2016)
   ISN 00430     2016 FORMAT ('0********* VOLUME ROUGHNESS LESS THAN 0.0, SET TO 0.0 FOR
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                     * CONTINUED CHECKING.')
   ISN 00431                 FAIL = .TRUE.
   ISN 00432              31  DIAMV(IV) = XINIT(8)*FR(1)
   ISN 00433                 IF (DIAMV(IV)) 32,33,75
   ISN 00434              32  WRITE (OUTPUT,2017)
   ISN 00435            2017  FORMAT ('0********* HYDRAULIC DIAMETER LESS THAN 0.0, SET TO DEFAU
                       *LT VALUE FOR CONTINUED CHECKING.')
   ISN 00436                 FAIL = .TRUE.
                       CX 33  DIAMV(IV) = 2.0*SQRT(AVOL(IV)/PI)
   ISN 00437              33  DIAMV(IV) = 2.000*DSQRT(AVOL(IV)/PI)                                    XJA
                       CX 75  IF (ROUGHV(IV) .LT. 0.5*DIAMV(IV)) GO TO 34
   ISN 00438              75  IF (ROUGHV(IV) .LT. 0.500*DIAMV(IV)) GO TO 34                           XJA
   ISN 00439                 WRITE (OUTPUT,2034)
   ISN 00440            2034  FORMAT ('0********* VOLUME ROUGHNESS IS NOT LESS THAN HALF THE VOL
                       *UME HYDRAULIC DIAMETER.')
   ISN 00441                 FAIL = .TRUE.
   ISN 00442              34  TFAIL = .FALSE.
                       CX     IF (INIT(9) .GE. 0) GO TO 135
   ISN 00443                 IF (INIT(2,9) .GE. 0) GO TO 135                                          XJA
                       CX     INIT(9) = -INIT(9)
   ISN 00444                 INIT(2,9) = -INIT(2,9)                                                   XJA
   ISN 00445                 TFAIL = .TRUE.
                       CX135  IHF = INIT(9)/10
   ISN 00446             135  IHF = INIT(2,9)/10                                                     XJA
                       CX     INIT(9) = INIT(9) - 10*IHF
   ISN 00447                 INIT(2,9) = INIT(2,9) - 10*IHF                                           XJA
   ISN 00448                 IF (IHF.EQ.0 .OR. IHF.EQ.1) GO TO 136
   ISN 00449                 IHF = 0
   ISN 00450                 TFAIL = .TRUE.
                       CX136  IF (INIT(9).EQ.0 .OR. INIT(9).EQ.1) GO TO 137
   ISN 00451             136  IF (INIT(2,9).EQ.0 .OR. INIT(2,9).EQ.1) GO TO 137                       XJA
                       CX     INIT(9) = 0
   ISN 00452                 INIT(2,9) = 0                                                            XJA
   ISN 00453                 TFAIL = .TRUE.
   ISN 00454             137  IF (.NOT.TFAIL) GO TO 138
   ISN 00455                 WRITE (OUTPUT,2021)
   ISN 00456            2021  FORMAT ('0********* VOLUME CONTROL INCORRECT, SET TO ZERO FOR CONT
                       *INUED CHECKING.')
   ISN 00457                 FAIL = .TRUE.
                       CX138  VCTRL(IV) = (MASK(58).AND.VCTRL(IV)) .OR. SHIFT(IHF,1) .OR.
                       CX     * INIT(9)
                       CX138  VCTRL(IV) = DOR(DOR(DAND(DMASK(58),VCTRL(IV)),SHIFTI(IHF,1)),OBIT XJA
                       CX     *(INIT(9)))                                                              XJA
   ISN 00458             138  VCTRL(IV) = DOR(DOR(DAND(DMASK(58),VCTRL(IV)),SHIFTI(IHF,1)),OBIT XJA
                       *(INIT(2,9)))                                                                  XJA
                       C  PROCESS VOLUME INITIAL CONDITIONS
   ISN 00459             115  IF (CMPFLG) GO TO 50
   ISN 00460                 IF (UNITI) GO TO 41
   ISN 00461                 FR(1) = PSIA
   ISN 00462                 FR(2) = ENG
   ISN 00463                 FR(3) = DEGF1
   ISN 00464                 FR(4) = DEGF2
   ISN 00465                 GO TO 42
                       CX 41  FR(1) = 1.0
   ISN 00466              41  FR(1) = 1.000                                                            XJA
                       CX     FR(2) = 1.0
   ISN 00467                 FR(2) = 1.000                                                            XJA
                       CX     FR(3) = 1.0
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   ISN 00468                 FR(3) = 1.000                                                            XJA
                       CX     FR(4) = 0.0
   ISN 00469                 FR(4) = 0.000                                                            XJA
   ISN 00470              42  L3C(1) = L3B(1) + 99
   ISN 00471                  L3C(6) = 1
   ISN 00472                 IBOR=0
                       CX     BORON(IV)=0.0
   ISN 00473                 BORON(IV)=0.000                                                          XJA
                       CX     CALL INP2 (IA(FILNOX(1)),INIT,L3C,XINIT)
   ISN 00474                 CALL INP2 (IA(1,FILNOX(1)),INIT,L3C,XINIT)                               XJA
   ISN 00475                 IF (L3C(6) .GE. 0) GO TO 43
   ISN 00476              77  WRITE (OUTPUT,2022)
   ISN 00477            2022  FORMAT ('0********* VOLUME CONDITONS SET TO LIQUID WATER FOR CONTI
                       *NUED CHECKING.')
                       CX     VCTRL(IV) = SHIFT(1,48) .OR. VCTRL(IV)
   ISN 00478                 VCTRL(IV) = DOR(SHIFTI(1,48),VCTRL(IV))                                  XJA
   ISN 00479                 TEMP(IV) = TT
                       CX     QUALE(IV) = 0.0
   ISN 00480                 QUALE(IV) = 0.000                                                        XJA
   ISN 00481                 GO TO 50
                       CX43  IF(INIT(1).GE.0  .AND. INIT(1).LE.6) GO TO 124
   ISN 00482              43  IF(INIT(2,1).GE.0  .AND. INIT(2,1).LE.6) GO TO 124                      XJA
                       CX     I3=INIT(1)-10
   ISN 00483                 I3=INIT(2,1)-10                                                          XJA
                       CX     IBOR=INIT(1)/10
   ISN 00484                 IBOR=INIT(2,1)/10                                                        XJA
   ISN 00485                 KBOR=6
   ISN 00486                 IF(I3.GE.0 .AND. I3.LE.6) GO TO 124
                       CX144  INIT(1) = 0
   ISN 00487             144  INIT(2,1) = 0                                                          XJA
   ISN 00488                 WRITE (OUTPUT,2023)
   ISN 00489            2023  FORMAT ('0********* CONTROL FOR VOLUME INITIAL CONDITIONS INCORREC
                       *T, SET TO ZERO FOR CONTINUED CHECKING.')
   ISN 00490                 FAIL = .TRUE.
                       CX124  VCTRL(IV) = SHIFT(INIT(1),48) .OR. VCTRL(IV)
                       CX124  VCTRL(IV) = DOR(SHIFTI(INIT(1),48),VCTRL(IV))                            XJA
   ISN 00491             124  VCTRL(IV) = DOR(SHIFTI(INIT(2,1),48),VCTRL(IV))                         XJA
                       CX     I3 = INIT(1) + 1
   ISN 00492                 I3 = INIT(2,1) + 1                                                       XJA
   ISN 00493                 I3=I3-10*IBOR
   ISN 00494                 IF(IBOR.EQ.1) L3C(6)=L3C(6)-1
   ISN 00495                 IF(I3.LE.4) GO TO 123
   ISN 00496                  IF (L3C(6).EQ.5 .OR. (L3C(6).EQ.4 .AND. I3.EQ.5)) GO TO 76
   ISN 00497                 WRITE (OUTPUT,2037) L3C(1)
   ISN 00498            2037  FORMAT ('0********* TOO FEW NUMBERS ENTERED ON CARD'I8,',')
   ISN 00499                 GO TO 77
   ISN 00500              76  P(IV)=XINIT(2)*FR(1)
   ISN 00501                 TEMP(IV)=XINIT(3)*FR(3)*FR(4)
                       CX     IF(XINIT(4).GE.0.0  .AND. XINIT(4).LE.1.0) GO TO 122
   ISN 00502                 IF(XINIT(4).GE.0.000  .AND. XINIT(4).LE.1.000) GO TO 122                 XJA
   ISN 00503                 FAIL=.TRUE.
                       CX     XINIT(4)=0.0
   ISN 00504                 XINIT(4)=0.000                                                           XJA
   ISN 00505                 WRITE(OUTPUT,2024)
   ISN 00506             122  QUALA(IV)=XINIT(4)
   ISN 00507                 KBOR=5
   ISN 00508                  IF (I3 .EQ. 3) GO TO 80
   ISN 00509                 TEMPF(IV)=XINIT(5)*FR(1)
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ISN 00510           IF(I3.EQ.6) TEMPF(IV)=XINIT(5)*FR(3)*FR(4)
ISN 00511           KBOR=6
ISN 00512           GO TO 30
ISN 00513       123 GO TO (131,132,133,134), I3
ISN 00514       131 P(IV) = XINIT(2)*FR(1)
ISN 00515           U(IV) = XINIT(3)*FR(2)
ISN 00516           KBOR=5
ISN 00517           IF (L3C(6) .GE. 4) GO TO 78
ISN 00518           WRITE (OUTPUT,2037) L3C(1)
ISN 00519           GO TO 79
           CX 78    IF (XINIT(4).GE.0.0 .AND. XINIT(4).LE.1.0) GO TO 125
ISN 00520      78   IF (XINIT(4).GE.0.000 .AND. XINIT(4).LE.1.000) GO TO 125          XJA
           CX 79    XINIT(4) = 0.0
ISN 00521      79   XINIT(4) = 0.000                                                  XJA
ISN 00522           WRITE (OUTPUT,2024)
ISN 00523    2024   FORMAT ('0********* QUALITY IN VOLUME INITIAL CONDITION INCORRECT,
                   * SET TO ZERO FOR CONTINUED CHECKING.')
ISN 00524           FAIL = .TRUE.
ISN 00525       125 QUAL$(IV) = XINIT(4)
ISN 00526           GO TO 80
ISN 00527       132 TEMP(IV) = XINIT(2)*FR(3) + FR(4)
ISN 00528           GO TO 127
ISN 00529       133 P(IV) = XINIT(2)*FR(1)
           CX127    IF (XINIT(3).GE.0.0 .AND. XINIT(3).LE.1.0) GO TO 128
ISN 00530      127  IF (XINIT(3).GE.0.000 .AND. XINIT(3).LE.1.000) GO TO 128          XJA
           CX       XINIT(3) = 0.0
ISN 00531           XINIT(3) = 0.000                                                  XJA
ISN 00532           WRITE (OUTPUT,2024)
ISN 00533           FAIL = .TRUE.
ISN 00534       128 QUALE(IV) = XINIT(3)
ISN 00535           GO TO 129
ISN 00536       134 P(IV) = XINIT(2)*FR(1)
ISN 00537           TEMP(IV) = XINIT(3)*FR(3) + FR(4)
ISN 00538       129 IF (L3C(6) .LT. 4) GO TO 50
           CX       IF (XINIT(4) .NE. 0.0) GO TO 81
ISN 00539           IF (XINIT(4) .NE. 0.000) GO TO 81                                 XJA
ISN 00540       80  IF (L3C(6) .EQ. 4) GO TO 50
           CX       IF (XINIT(5) .EQ. 0.0) GO TO 50
ISN 00541           IF (XINIT(5) .EQ. 0.000) GO TO 50                                 XJA
ISN 00542       81  WRITE (OUTPUT,2025)
ISN 00543    2025   FORMAT ('0********* CONTROL FOR VOLUME INITIAL CONDITIONS INDICATE
                  *S THAT FOURTH OR FIFTH PARAMETER SHOULD BE ZERO.')
ISN 00544           FAIL = .TRUE.
           C  PROCESS JUNCTION INPUT
ISN 00545       50  IF(IBOR.EQ.1) BORON(IV)=XINIT(KBOR)
ISN 00546           IF(NJ.EQ.0) GO TO 71
ISN 00547           IJS = IJ
ISN 00548           IT = 0
ISN 00549           NT = 1
ISN 00550           L3B(1) = NC*10000 + 101
ISN 00551       39  L3D(1) = L3B(1) + NT*1000
           CX       CALL LINK (L3D(1),IX,N3,N4,IA(FILNDX(1)))
ISN 00552           CALL LINK (L3D(1),IX,N3,N4,IA(1,FILNDX(1)))                       XJA
ISN 00553           IF (N4 .NE. 0) GO TO 44
ISN 00554           IF (IX .EQ. -1) GO TO 59
ISN 00555           IX = (IX-L3B(1))/1000
ISN 00556           IF ((IX .NE. NT) GO TO 40
ISN 00557           WRITE (OUTPUT,2010) L3D(1)
```

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ISN 00558    2010   FORMAT ('0********* CARD'I8,' IS MISSING.')
ISN 00559           GO TO 53
ISN 00560       40  NT = IX
ISN 00561           GO TO 66
           CX 44    IHF = JUNNO(IJ)
ISN 00562      44   IHF = JUNNO(2,IJ)                                                 XJA
           CX       JUNNO(IJ) = NC*1000000 + NT*10000
ISN 00563           JUNNO(2,IJ) = NC*1000000 + NT*10000                               XJA
ISN 00564           IF (.NOT.CMPFLG) GO TO 461
           CX       IF (JUNNO(IJ) .EQ. IHF) GO TO 461
ISN 00565           IF (JUNNO(2,IJ) .EQ. IHF) GO TO 461                               XJA
ISN 00566           WRITE (OUTPUT,2036)
ISN 00567    2036   FORMAT ('0********* JUNCTION CARD NUMBERS DO NOT MATCH EXISTING JU
                  *NCTIONS AS REQUIRED WITH CHANGE FLAG OPTION.')
ISN 00568           FAIL = .TRUE.
ISN 00569           L3C(1) = NC*10000
ISN 00570           L3C(2) = L3C(1) + 9999
           CX       IHF = INP10(IA(FILNDX(1)),L3C(1),L3C(2))
ISN 00571           IHF = INP10(IA(1,FILNDX(1)),L3C(1),L3C(2))                        ###
ISN 00572           GO TO 301
           CX461    FR(1) = 1.0
ISN 00573     461   FR(1) = 1.000                                                     XJA
ISN 00574           IF (.NOT.UNIT1) FR(1) = FT2
ISN 00575           L3D(6) = 1
           CX        IMREG(IJ)=0
ISN 00576           IMREG(IJ) = DBIT(0)                                               XJA
           CX       CALL INP2 (IA(FILNDX(1)),INIT,L3D,XINIT)
ISN 00577           CALL INP2 (IA(1,FILNDX(1)),INIT,L3D,XINIT)                        XJA
ISN 00578           IF (L3D(6) .GT. 0) GO TO 45
ISN 00579           WRITE (OUTPUT,2008)
ISN 00580    2008   FORMAT ('0********* JUNCTION GEOMETRY SET TO DEFAULT CONDITIONS FO
                  *R CONTINUED CHECKING.')
ISN 00581           IF (CMPFLG) GO TO 442
           CX       IJ1(IJ) = 0
ISN 00582           IJ1(IJ) = DBIT(0)                                                 XJA
           CX       IJ2(IJ) = 0
ISN 00583           IJ2(IJ) = DBIT(0)                                                 XJA
           CX       AJUN(IJ) = 0.0
ISN 00584           AJUN(IJ) = 0.000                                                  XJA
           CX       FJUNF(IJ) = 0.0
ISN 00585           FJUNF(IJ) = 0.000                                                 XJA
           CX       FJUNR(IJ) = 0.0
ISN 00586           FJUNR(IJ) = 0.000                                                 XJA
ISN 00587     442   FAIL = .TRUE.
ISN 00588           GO TO 55
ISN 00589       45  IF (CMPFLG) GO TO 52
ISN 00590           TFAIL = .FALSE.
           CX       IF ((INIT(1) .GT. 0) GO TO 25
ISN 00591           IF ((INIT(2,1) .GT. 0) GO TO 25                                   XJA
           CX       INIT(1) = 0
ISN 00592           INIT(2,1) = 0                                                     XJA
ISN 00593           TFAIL = .TRUE.
           CX 25    IF ((INIT(2) .GT. 0) GO TO 46
ISN 00594       25  IF ((INIT(2,2) .GT. 0) GO TO 46                                  XJA
           CX       INIT(2) = 0
ISN 00595           INIT(2,2) = 0                                                     XJA
ISN 00596           TFAIL = .TRUE.
ISN 00597       46  IF (.NOT.TFAIL) GO TO 47
```

```
ISN 00598            WRITE (OUTPUT,2006)
ISN 00599       2006 FORMAT ('0******** VOLUME POINTERS LESS THAN OR EQUAL TO 0, SET T
                    *O 0 FOR FURTHER CHECKING.')
ISN 00600            FAIL = .TRUE.
                C$ 47 IJ1(IJ) = INIT(1)
                C$ 47 IJ1(IJ) = DBITC(INIT(1))                                    XJA
ISN 00601           47 IJ1(IJ) = DBITC(INIT(2,1))                                 XJA
                C$    IJ2(IJ) = INIT(2)
                C$    IJ2(IJ) = DBITC(INIT(2))                                    XJA
ISN 00602             IJ2(IJ) = DBITC(INIT(2,2))                                  XJA
                C$    IF (INIT(1)/1000000.EQ.NC .OR. INIT(2)/1000000.EQ.NC) GO TO 68
ISN 00603             IF (INIT(2,1)/1000000.EQ.NC .OR. INIT(2,2)/1000000.EQ.NC) GO TO68XJA
                     *                                                            XJA
ISN 00604             WRITE (OUTPUT,2032)
ISN 00605       2032 FORMAT ('0******** JUNCTION CONNECTIONS DO NOT INVOLVE COMPONENT
                    *VOLUMES.')
                C$ 48 IF (XINIT(3) .GE. 0.0) GO TO 48
ISN 00606           48 IF (XINIT(3) .GE. 0.000) GO TO 48                          XJA
ISN 00607             WRITE (OUTPUT,2014)
ISN 00608       2014 FORMAT ('0******** JUNCTION AREA LESS THAN 0.0, SET TO 0.0 FOR CO
                    *NTINUED CHECKING.')
                C$    XINIT(3) = 0.0
ISN 00609             XINIT(3) = 0.000                                            XJA
ISN 00610             FAIL = .TRUE.
ISN 00611           48 AJUN(IJ) = XINIT(3)*FR(1)
ISN 00612             TFAIL = .FALSE.
                C$    IF (XINIT(4) .GE. 0.0) GO TO 49
ISN 00613             IF (XINIT(4) .GE. 0.000) GO TO 49                           XJA
                C$    XINIT(4) = 0.0
ISN 00614             XINIT(4) = 0.000                                            XJA
ISN 00615             TFAIL = .TRUE.
                C$ 49 IF (XINIT(5) .GE. 0.0) GO TO 51
ISN 00616           49 IF (XINIT(5) .GE. 0.000) GO TO 51                          XJA
                C$    XINIT(5) = 0.0
ISN 00617             XINIT(5) = 0.000                                            XJA
ISN 00618             TFAIL = .TRUE.
ISN 00619           51 FJUNF(IJ) = XINIT(4)
ISN 00620             FJUNR(IJ) = XINIT(5)
ISN 00621             IF (.NOT.TFAIL) GO TO 52
ISN 00622             WRITE (OUTPUT,2004)
ISN 00623       2004 FORMAT ('0******** FORM LOSS COEFFICIENTS LESS THAN 0.0, SET TO 0
                    *.0 FOR CONTINUED CHECKING.')
ISN 00624             FAIL = .TRUE.
ISN 00625           52 TFAIL = .FALSE.
                C$    IF (INIT(6) .GE. 0) GO TO 54
ISN 00626             IF (INIT(2,6) .GE. 0) GO TO 54                              XJA
                C$    INIT(6) = -INIT(6)
ISN 00627             INIT(2,6) = -INIT(2,6)                                      XJA
ISN 00628             TFAIL = .TRUE.
                C$ 54 ICK = INIT(6)/1000
ISN 00629           54 ICK = INIT(2,6)/1000                                       XJA
                C$    INIT(6) = INIT(6) - 1000*ICK
ISN 00630             INIT(2,6) = INIT(2,6) - 1000*ICK                            XJA
                C$    IRF = INIT(6)/100
ISN 00631             IRF = INIT(2,6)/100                                         XJA
                C$    INIT(6) = INIT(6) - 100*IRF
ISN 00632             INIT(2,6) = INIT(2,6) - 100*IRF                             XJA
                C$    IHF = INIT(6)/10
```



```
ISN 00633             IHF = INIT(2,6)/10                                          XJA
                C$    ISF = INIT(6) - IHF*10
ISN 00634             ISF = INIT(2,6) - IHF*10                                    XJA
ISN 00635             IF (ICK .LT. 2) GO TO 72
ISN 00636             ICK = 0
ISN 00637             TFAIL = .TRUE.
ISN 00638          72 IF (IRF .LT. 2) GO TO 38
ISN 00639             IRF = 0
ISN 00640             TFAIL = .TRUE.
ISN 00641          38 IF (IHF .LE. 2) GO TO 36
ISN 00642             IHF = 0
ISN 00643             TFAIL = .TRUE.
ISN 00644          36 IF (ISF .LT. 2) GO TO 37
ISN 00645             ISF = 0
ISN 00646             TFAIL = .TRUE.
                C$ 37 JC(IJ) = (.NOT.SHIFT(MASK(5),59).AND.JC(IJ)) .OR. SHIFT(IRF,57)
                C$    * .OR. SHIFT(IHF,55) .OR. SHIFT(ISF,54)
ISN 00647           37 JC(IJ) = OR(OR(OR(OR(ANDC(NOT(SHIFT(MASK(5),59)),JC(IJ)),SHIFT(XJA
                    *(IRF,57)),SHIFT((IHF,55)),SHIFT((ISF,54))                    XJA
                C$    JC(IJ+1) = (.NOT.SHIFT(MASK(1),59).AND.JC(IJ+1)) .OR.
                C$    * SHIFT(ICK,58)
ISN 00648             JC(IJ+1) = OR(ANDC(NOT(SHIFT(MASK(1),59)),JC(IJ+1)),SHIFT(ICKXJA
                    *,58))                                                        XJA
ISN 00649             IF (.NOT.TFAIL) GO TO 55
ISN 00650             WRITE (OUTPUT,2020)
ISN 00651       2020 FORMAT ('0******** JUNCTION CONTROLS INCORRECT, SET TO ZERO FOR C
                    *ONTINUED CHECKING.')
ISN 00652             FAIL = .TRUE.
                C  PROCESS JUNCTION INITIAL CONDITIONS
ISN 00653          55 IF (CMPFLG) GO TO 59
ISN 00654             L3E(1) = L3D(1) * 100
ISN 00655             L3E(6) = 1
                C$    CALL INP2 (IA(FILNDX(1)),INIT,L3E,XINIT)
ISN 00656             CALL INP2 (IA(1,FILNDX(1)),INIT,L3E,XINIT)                  XJA
ISN 00657             IF (L3E(6) .GT. 0) GO TO 57
ISN 00658             WRITE (OUTPUT,2018)
ISN 00659       2018 FORMAT ('0******** JUNCTION INITIAL VELOCITIES SET TO 0.0 FOR CON
                    *TINUED CHECKING.')
                C$    VELFJ(IJ) = 0.0
ISN 00660             VELFJ(IJ) = 0.000                                           XJA
                C$    VELGJ(IJ) = 0.0
ISN 00661             VELGJ(IJ) = 0.000                                           XJA
                C$    VELJ(IJ) = 0.0
ISN 00662             VELJ(IJ) = 0.000                                            XJA
ISN 00663             FAIL = .TRUE.
ISN 00664             GO TO 59
                C$ 57 FR(1) = 1.0
ISN 00665          57 FR(1) = 1.000                                               XJA
                C$    FR(2) = 1.0
ISN 00666             FR(2) = 1.000                                               XJA
ISN 00667             IF (.NOT.UNIT1) FR(2) = FT
ISN 00668             IF (IXP .NE. 0) GO TO 58
ISN 00669             IF (.NOT.UNIT1) FR(1) = FT
ISN 00670             VELFJ(IJ) = XINIT(1)*FR(1)
ISN 00671             VELGJ(IJ) = XINIT(2)*FR(1)
ISN 00672             GO TO 35
ISN 00673          58 IF (.NOT.UNIT1) FR(1) = XLBSEC
ISN 00674             VELFJ(IJ) = XINIT(1)*FR(1)
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  ISN 00675          VELGJ(IJ) = XINIT(2)*FR(1)
  ISN 00676       35 VELJ(IJ) = XINIT(3)*FR(2)
  ISN 00677       59 IJ = IJ + IJSKP
  ISN 00678          IT = IT + 1
  ISN 00679          IF (IT .EQ. NJ) GO TO 301
  ISN 00680       53 NT = NT + 1
  ISN 00681       66 IF (NT .LT. 10) GO TO 39
  ISN 00682          WRITE (OUTPUT,2019) L3A(1)
  ISN 00683     2019 FORMAT ('0******** NUMBER OF JUNCTION ENTERED IS NOT CONSISTENT W
                    *ITH NUMBER ON CARD'I8,', DEFAULTS BEING ENTERED.')
  ISN 00684          DO 70 I = IJ,IJE,IJSKP
              CY       JC(I) = 0
  ISN 00685            JC(I) = DBIT(0)                                          YJA
              CY       JC(I+1) = 0
  ISN 00686            JC(I+1) = DBIT(0)                                        YJA
              CY       IJ1(I) = 0
  ISN 00687            IJ1(I) = DBIT(0)                                         YJA
              CY       IJ2(I) = 0
  ISN 00688            IJ2(I) = DBIT(0)                                         YJA
              CX       AJUN(I) = 0.0
  ISN 00689            AJUN(I) = 0.000                                          XJA
              CX       FJUNF(I) = 0.0
  ISN 00690            FJUNF(I) = 0.000                                         XJA
              CX       FJUNR(I) = 0.0
  ISN 00691            FJUNR(I) = 0.000                                         XJA
              CX       VELFJ(I) = 0.0
  ISN 00692            VELFJ(I) = 0.000                                         XJA
              CX       VELGJ(I) = 0.0
  ISN 00693            VELGJ(I) = 0.000                                         XJA
              CX       VELJ(I) = 0.0
  ISN 00694            VELJ(I) = 0.000                                          XJA
              CX       JUNNO(I) = NC*1000000
  ISN 00695            JUNNO(2,I) = NC*1000000                                  XJA
  ISN 00696       70 CONTINUE
  ISN 00697          FAIL = .TRUE.
  ISN 00698      301 IJ = IJS
              C  IF SEPARATOR, DO SEPARATOR CHECKS AND SET SEPARATOR FLAG IN JUNCTION
              C  BLOCK.
              C*       ITYPE=.NOT.MASK(49) .AND.SHIFT(CMPNUM(I),12)             JETPMP
  ISN 00699          ITYPE=IDAND(DNOT(DMASK(49)),SHIFT(CMPNUM(I),12))           JETPMP
  ISN 00700          IF(ITYPE.NE.8 .AND.ITYPE.NE.14) GO TO 71                   JETPMP
  ISN 00701          IF(NJ.GE.1.OR.ITYPE.EQ.14) GO TO 89                        JETPMP
  ISN 00702          WRITE (OUTPUT,2038)
  ISN 00703     2038 FORMAT ('0******** NUMBER OF JUNCTIONS IN A SEPARATOR COMPONENT I
                    *S NOT GREATER OR EQUAL TO 1.')
  ISN 00704          FAIL = .TRUE.
  ISN 00705          GO TO 71
  ISN 00706       89 CONTINUE                                                   JETPMP
  ISN 00707          IF(ITYPE.NE.14) GO TO 91                                   JETPMP
  ISN 00708          IF(NJP.LT.4) GO TO 5000                                    JETPMP  ・ジェットポンプコンポーネント数の
  ISN 00709          WRITE(OUTPUT,6109)                                         JETPMP   制限チェック(現在4個まで)
  ISN 00710     6109 FORMAT('0********ERROR  THE NUMBER OF JETPUMP COMPONENTS'  JETPMP  ・エラーメッセージの出力
                   1      ,' MUST BE LESS THAN EQUAL TO 4********')             JETPMP
  ISN 00711          FAIL=.TRUE.                                                JETPMP
  ISN 00712          GO TO 5100                                                 JETPMP
  ISN 00713     5000 NJP=NJP+1                                                  JETPMP  ・ジェットポンプコンポーネント
  ISN 00714     5100 NOCOM(NJP)=NC                                              JETPMP   のカウンター
              C                                                                 JETPMP  ・コンポーネント番号をStoreする。
                                                                                         NC：コンポーネント番号

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              C PICK UP DIAMETER DATA FROM CCCN301-CCCN399 CARDS                JETPMP
  ISN 00715          L3F(1)=NC*10000+301                                        JETPMP
  ISN 00716          L3F(2)=L3F(1)+98                                           JETPMP        L3F(6)を1にセットする。      ※1
  ISN 00717          L3F(6)=1                                                   JETPMP ←追加 Sub. INP2をCALLした後の
  ISN 00718          CALL INP2(IA(1,FILNDX(1)),INIT,L3F,XINIT)                  JETPMP        L3F(6)の値がFACOMとCDC
  ISN 00719          IF(L3F(6).GT.0) GO TO  100                                 JETPMP        システムで異なる。
  ISN 00720          WRITE(OUTPUT,2040)                                         JETPMP
  ISN 00721     2040 FORMAT('0*******JETPUMP DIAMETERS DATA SET TO ZERO FOR CONTINUED  JETPM
                    *CHECKING********')                                         JETPMP
  ISN 00722          DO 3100 I=1,7                                              JETPMP
  ISN 00723          DIA(I,NJP)=0.DO                                            JETPMP  径データのクリアー
  ISN 00724     3100 CONTINUE                                                   JETPMP
  ISN 00725          FAIL=.TRUE.                                                JETPMP
  ISN 00726          GO TO 101                                                  JETPMP
  ISN 00727      100 CONTINUE                                                   JETPMP
              C CONVERT AND STORE DIAMETER DATA                                 JETPMP
  ISN 00728          FR(1)=1.000                                                JETPMP
  ISN 00729          IF(.NOT.UNITI) FR(1)=FT                                    JETPMP
  ISN 00730          DO 3200 I=1,7                                              JETPMP  ジェットポンプの径データを
  ISN 00731          DIA(I,NJP)=XINIT(I)*FR(1)                                  JETPMP  COMMON /JPDATA/ にStore
  ISN 00732     3200 CONTINUE                                                   JETPMP  する。
  ISN 00733      101 CONTINUE                                                   JETPMP
              C PICK UP LENGTH DATA FROM CCCN401-CCCN499 CARDS                  JETPMP
  ISN 00734          L3G(1)=L3F(1)+100                                          JETPMP
  ISN 00735          L3G(2)=L3G(1)+98                                           JETPMP
  ISN 00736          L3G(6)=1                                                   JETPMP ←追加 ※1と同様の理由に
  ISN 00737          CALL INP2(IA(1,FILNDX(1)),INIT,L3G,XINIT)                  JETPMP        よる。
  ISN 00738          IF(L3G(6).GT.0) GO TO 102                                  JETPMP
  ISN 00739          WRITE(OUTPUT,2041)                                         JETPMP
  ISN 00740     2041 FORMAT('0*******JETPUMP LENGTHS DATA SET TO ZERO FOR CONTINUED  JETPMP
                    *CHECKING********')                                         JETPMP
  ISN 00741          DO 3300 I=1,5                                              JETPMP
  ISN 00742          RLENG(I,NJP)=0.DO                                          JETPMP  LENGTH データのクリアー
  ISN 00743     3300 CONTINUE                                                   JETPMP
  ISN 00744          FAIL=.TRUE.                                                JETPMP
  ISN 00745          GO TO 103                                                  JETPMP
  ISN 00746      102 CONTINUE                                                   JETPMP
              C CONVERT AND STORE LENGTH DATA                                   JETPMP
  ISN 00747          FR(1)=1.0                                                  JETPMP
  ISN 00748          IF(.NOT.UNITI) FR(1)=FT                                    JETPMP
  ISN 00749          DO 3400 I=1,5                                              JETPMP  ジェットポンプのLENGTHデータを
  ISN 00750          RLENG(I,NJP)=XINIT(I)*FR(1)                                JETPMP  COMMON /JPDATA/ にStore
  ISN 00751     3400 CONTINUE                                                   JETPMP  する。
  ISN 00752      103 CONTINUE                                                   JETPMP
              C PICK UP FRICTION FACTOR DATA FROM CCCN501-CCCN599 CARDS         JETPMP
  ISN 00753          L3H(1)=L3G(1)+100                                          JETPMP
  ISN 00754          L3H(2)=L3H(1)+98                                           JETPMP
  ISN 00755          L3H(6)=1                                                   JETPMP ←追加 ※1と同様の理由に
  ISN 00756          DO 3450 I=1,6                                              JETPMP        よる。
  ISN 00757          XINIT(I)=0.00                                              JETPMP
  ISN 00758     3450 CONTINUE                                                   JETPMP
  ISN 00759          CALL INP2(IA(1,FILNDX(1)),INIT,L3H,XINIT)                  JETPMP
  ISN 00760          IF(L3H(6).GE.0) GO TO 104                                  JETPMP
  ISN 00761          WRITE(OUTPUT,2042)                                         JETPMP
  ISN 00762     2042 FORMAT('0*******FRICTION FACTOR DATA SET TO ZERO FOR CONTINUED  JETPMP
                    *CHECKING********')                                         JETPMP
  ISN 00763          DO 3500 I=1,6                                              JETPMP
  ISN 00764          RAMDA(I,NJP)=0.DO                                          JETPMP  摩擦係数入力データのクリアー
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   ISN 00765      3500 CONTINUE                                                                  JETPMP
   ISN 00766           FAIL=.TRUE.                                                               JETPMP
   ISN 00767           GO TO 105                                                                 JETPMP
   ISN 00768       104 CONTINUE                                                                  JETPMP
                   C STORE FRICTION FACTOR DATA                                                  JETPMP
   ISN 00769           DO 3600 I=1,6                                                             JETPMP
   ISN 00770           RAMDA(I,NJP)=XINIT(I)                                                     JETPMP
   ISN 00771       3600 CONTINUE                                                                 JETPMP
   ISN 00772       105  CONTINUE                                                                 JETPMP
                   C                                                                             JETPMP
                   C READ HOW MANY JETPMPS ARE TO BE SIMULATED BY THIS COMPONENT                 JETPMP
                   C ( FOR CASES WHEN SEVERAL REACTOR JETPUMPS ARE COMBINED FOR RELAP5)          JETPMP
                   C                                                                             JETPMP
   ISN 00773           L3I(1)=L3H(1)+100                                                         JETPMP
   ISN 00774           L3I(2)=L3I(1)+98                                                          JETPMP
   ISN 00775           INIT(2,1)=1                                                               JETPMP
   ISN 00776           CALL INP2(IA(1,FILNOX(1)),INIT,L3I,XINIT)                                 JETPMP
   ISN 00777           IF(L3I(6).GE.0) GO TO 106                                                 JETPMP
   ISN 00778           FAIL=.TRUE.                                                               JETPMP
   ISN 00779           WRITE(OUTPUT,2043)                                                        JETPMP
   ISN 00780       2043 FORMAT('0********ERROR ON CARD CCCN701, NUMBER OF JET PUMPS MODELEJETPMP
                      +D BY THIS COMPONENT SET TO 1 FOR CHECKING.')                              JETPMP
   ISN 00781       106  CONTINUE                                                                 JETPMP
                   CX      VCTRL(IV)=VCTRL(IV).OR.SHIFT(INIT(1),24)                              JETPMP
   ISN 00782           VCTRL(IV)=DOR(VCTRL(IV),SHIFT(INIT(2,1),24))                              JETPMP
   ISN 00783           IF(NJ.EQ.3) GO TO 71                                                      JETPMP
   ISN 00784           FAIL=.TRUE.                                                               JETPMP
   ISN 00785           WRITE(OUTPUT,2039)                                                        JETPMP
   ISN 00786       2039 FORMAT('0******ERROR  NUMBER OF JUNCTIONS FOR JETPUMP MUST BE EQUAJETPMP
                      +L TO 3 (DRIVE,SUCTION,AND OUTLET')                                        JETPMP
   ISN 00787           GO TO 71                                                                  JETPMP
                   CX 91  JC(IJ+1) = SHIFT(MASK(1),57) .OR. JC(IJ+1)
   ISN 00788          91  JC(IJ+1) = DOR(SHIFT(OMASK(1),57),JC(IJ+1))                           XJA
                   C  EDIT COMPONENT INPUT.
   ISN 00789          71  L3C(1) = NC*1000000 + 10000
                   CX      VOLNO(IV) = L3C(1)
   ISN 00790           VOLNO(2,IV) = L3C(1)                                                      XJA
   ISN 00791           WRITE (OUTPUT,2105)
   ISN 00792       2105 FORMAT ('0  VOL NO.'5X'FLOW AREA'8X'FLOW LENGTH'6X'VOLUME'11X
                      + 'HORIZ. ANGLE'5X'VERT. ANGLE'6X'ELEV. CHNG.')
   ISN 00793           IF (UNITO) GO TO 161
   ISN 00794           WRITE (OUTPUT,2106)
   ISN 00795       2106 FORMAT(15X'(FT2)'12X'(FT)'13X'(FT3)'12X'(DEG)'12X
                      + '(DEG)'12X'(FT)')
   ISN 00796           GO TO 162
   ISN 00797        161 WRITE (OUTPUT,2107)
   ISN 00798       2107 FORMAT (15X'(M2)'13X'(M)'14X'(M3)'13X'(DEG)'12X'(DEG)'12X'(M)')
   ISN 00799        162 IF (.NOT.UNITO) GO TO 163
   ISN 00800           WRITE (OUTPUT,2102) L3C(1),AVOL(IV),DL(IV),V(IV),RHOF(IV),
                      + RHO(IV),DZ(IV)
   ISN 00801       2102 FORMAT (I10,1P6E17.6)
   ISN 00802           GO TO 164
   ISN 00803        163 XINIT(2) = AVOL(IV)/FT2
   ISN 00804           XINIT(3) = DL(IV)/FT
   ISN 00805           XINIT(4) = V(IV)/FT3
   ISN 00806           XINIT(5) = DZ(IV)/FT
   ISN 00807           WRITE (OUTPUT,2102) L3C(1),(XINIT(IHF),IHF=2,4),RHOF(IV),RHO(IV),
                      + XINIT(5)
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   ISN 00808        164 WRITE (OUTPUT,2108)
   ISN 00809       2108 FORMAT ('0  VOL NO.'5X'ROUGHNESS'8X'HYDRAULIC DIAM.'4X
                      + 'VOLUME  INIT. COND.'5X'I.C. VALUE 1'5X'I.C. VALUE 2'5X
                      +'I.C.VALUE 3   I.C. VALUE 4')
   ISN 00810           IF (UNITO) GO TO 177
   ISN 00811           WRITE (OUTPUT,2109)
   ISN 00812       2109 FORMAT (15X'(FT)'13X'(FT)'16X'FLAGS'9X'FLAG')
   ISN 00813           GO TO 178
   ISN 00814        177 WRITE (OUTPUT,2110)
   ISN 00815       2110 FORMAT (15X'(M)'14X'(M)'17X'FLAGS'9X'FLAG')
                   CX178  IHF = 10*(.NOT.MASK(59).AND.SHIFT(VCTRL(IV),59)) +
                   CX     + (.NOT.MASK(59).AND.VCTRL(IV))
   ISN 00816        178  IHF = 10*IOAND(DNOT(DMASK(59)),SHIFT(VCTRL(IV),59))+IOAND(DNOT(DMXJA
                      +ASK(59)),VCTRL(IV))                                                       XJA
                   CX      INIT(1) =  .NOT.MASK(55) .AND. SHIFT(VCTRL(IV),12)
                   CX      INIT(1) = IOAND(DNOT(DMASK(55)),SHIFT(VCTRL(IV),12))                  XJA
   ISN 00817           INIT(2,1) = IOAND(DNOT(DMASK(55)),SHIFT(VCTRL(IV),12))                    XJA
                   CX     I2=INIT(1)*1-10*IBOR
   ISN 00818           I2=INIT(2,1)*1-10*IBOR                                                    XJA
   ISN 00819           IF (.NOT.UNITO) GO TO 185
   ISN 00820           IF(I2.GT.4) GO TO 188
                   CX     XINIT(5)=0.0
   ISN 00821           XINIT(5)=0.000                                                            XJA
   ISN 00822           GO TO (191,192,193,194), I2
   ISN 00823        191  XINIT(2) = P(IV)
   ISN 00824           XINIT(3) = U(IV)
   ISN 00825           XINIT(4) = QUALS(IV)
   ISN 00826           GO TO 195
   ISN 00827        192  XINIT(2) = TEMP(IV)
   ISN 00828           GO TO 196
   ISN 00829        193  XINIT(2) = P(IV)
   ISN 00830        196  XINIT(3) = QUALE(IV)
                   CX      XINIT(4) = 0.0
   ISN 00831           XINIT(4) = 0.000                                                          XJA
   ISN 00832           GO TO 195
   ISN 00833        194  XINIT(2) = P(IV)
   ISN 00834           XINIT(3) = TEMP(IV)
                   CX      XINIT(4) = 0.0
   ISN 00835           XINIT(4) = 0.000                                                          XJA
   ISN 00836           GO TO 195
   ISN 00837        188  XINIT(2)=P(IV)
   ISN 00838           XINIT(3)=TEMP(IV)
   ISN 00839           XINIT(4)=QUALA(IV)
                   CX      XINIT(5)=0.0
   ISN 00840           XINIT(5)=0.000                                                            XJA
   ISN 00841           IF(I2.GT.5) XINIT(5)=TEMPF(IV)
                   CX195  WRITE (OUTPUT,2103) L3C(1),ROUGHV(IV),DIAMV(IV),IHF,
                   CX     + INIT(1),(XINIT(K),K=2,5)
   ISN 00842        195  WRITE (OUTPUT,2103) L3C(1),ROUGHV(IV),DIAMV(IV),IHF,                    XJA
                      + INIT(2,1),(XINIT(K),K=2,5)                                               XJA
   ISN 00843       2103 FORMAT(I10,1PZE17.6,2I13,3E17.6,E14.6)
   ISN 00844            GO TO 67
   ISN 00845        165  XINIT(2) = ROUGHV(IV)/FT
   ISN 00846           XINIT(3) = DIAMV(IV)/FT
   ISN 00847           IF(I2.GT.4) GO TO 187
                   CX     XINIT(5)=0.0
   ISN 00848           XINIT(5)=0.000                                                            XJA
   ISN 00849           GO TO (171,172,173,174), I2
```

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   ISN 00850      171  XINIT(4) = P(IV)/PSIA
   ISN 00851           XINIT(5) = U(IV)/ENG
   ISN 00852           XINIT(6) = QUALS(IV)
   ISN 00853           GO TO 175
   ISN 00854      172  XINIT(4) = (TEMP(IV) - DEGF2)/DEGF1
   ISN 00855           GO TO 176
   ISN 00856      173  XINIT(4) = P(IV)/PSIA
   ISN 00857      176  XINIT(5) = QUALE(IV)
               CX      XINIT(6) = 0.0
   ISN 00858           XINIT(6) = 0.000                                                          XJA
   ISN 00859           GO TO 175
   ISN 00860      174  XINIT(4) = P(IV)/PSIA
   ISN 00861           XINIT(5) = (TEMP(IV) - DEGF2)/DEGF1
               CX      XINIT(6) = 0.0
   ISN 00862           XINIT(6) = 0.000                                                          XJA
   ISN 00863          GO TO 175
   ISN 00864      187  XINIT(2)=P(IV)/PSIA
   ISN 00865           XINIT(3)=(TEMP(IV)-DEGF2)/DEGF1
   ISN 00866           XINIT(4)=QUALA(IV)
               CX      XINIT(5)=0.0
   ISN 00867           XINIT(5)=0.000                                                            XJA
   ISN 00868           IF(I2.EQ.6) XINIT(5)=(TEMPF(IV)-DEGF2)/DEGF1
   ISN 00869           IF(I2.EQ.7) XINIT(5)=TEMPF(IV)/PSIA
               CX175   WRITE (OUTPUT,2103) L3C(1),XINIT(2),XINIT(3),IHF,INIT(1),
               CX    * (XINIT(K),K=4,7)
   ISN 00870      175  WRITE (OUTPUT,2103) L3C(1),XINIT(2),XINIT(3),IHF,INIT(2,1),             XJA
                     * (XINIT(K),K=4,7)                                                        XJA
   ISN 00871       67  IF(IBOR.EQ.1) WRITE(OUTPUT,320) BORON(IV)
   ISN 00872      320  FORMAT(5X,' BORON CONCENTRATION IS  ',E16.6)
   ISN 00873           IF(NJ.EQ.0) GO TO 200
   ISN 00874           WRITE (OUTPUT,2111)
   ISN 00875     2111  FORMAT ('0  JUN.NO. FROM VOL.    TO VOL.'5X'JUNCTION AREA'
                     * 4X'FORWARD LOSS'5X'REVERSE LOSS'7X'JUNCTION')
   ISN 00876           IF (UNITO) GO TO 179
   ISN 00877           WRITE (OUTPUT,2112)
   ISN 00878     2112  FORMAT (35X'(FT2)'12X'COEFFICIENT'6X'COEFFICIENT'11X'FLAGS')
   ISN 00879           GO TO 180
   ISN 00880      179  WRITE (OUTPUT,2113)
   ISN 00881     2113  FORMAT (35X'(M2)'13X'COEFFICIENT'6X'COEFFICIENT'11X'FLAGS')
   ISN 00882      180  DO 350 I = IJS,IJE,IJSKP
               CX        IHF = 1000*(.NOT.MASK(59).AND.SHIFT(JC(I+1),2)) +
               CX      * 100*(.NOT.MASK(59).AND.SHIFT(JC(I),3)) +
               CX      * 10*(.NOT.MASK(58).AND.SHIFT(JC(I),5)) +
               CX      * (.NOT.MASK(59).AND.SHIFT(JC(I),6))
   ISN 00883           IHF = 1000*IDAND(DNOT(DMASK(59)),SHIFT(JC(I+1),2))+100*IDAND(DNOJA
                     *OT(DMASK(59)),SHIFT(JC(I),3))+10*IDAND(DNOT(DMASK(58)),SHIFT(JC(I)*JA
                     *,5))+IDAND(DNOT(DMASK(59)),SHIFT(JC(I),6))                               XJA
   ISN 00884           IF (UNITO) GO TO 351
   ISN 00885           XINIT(2) = AJUN(I)/FT2
               CX      WRITE (OUTPUT,2026) JUNNO(I),IJ1(I),IJ2(I),XINIT(2),FJUNF(I),
               CX    * FJUNR(I),IHF
   ISN 00886           IJ1WW = INTO(IJ1(I))                                                      ###
   ISN 00887           IJ2WW = INTO(IJ2(I))                                                      ###
   ISN 00888           WRITE (OUTPUT,2026) JUNNO(2,I),IJ1WW,IJ2WW,XINIT(2),FJUNF(I),###
                     *   FJUNR(I),IHF                                                          XJA
   ISN 00889           GO TO 350
               CX351   WRITE (OUTPUT,2026) JUNNO(I),IJ1(I),IJ2(I),AJUN(I),FJUNF(I),
               CX    * FJUNR(I),IHF


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   ISN 00890      351  IJ1WW = INTO(IJ1(I))                                                      ###
   ISN 00891           IJ2WW = INTO(IJ2(I))                                                      ###
   ISN 00892           WRITE (OUTPUT,2026) JUNNO(2,I),IJ1WW,IJ2WW,AJUN(I),FJUNF(I), ###
                     *   FJUNR(I),IHF                                                          XJA
   ISN 00893     2026  FORMAT (3I10,1P3E17.6,I15)
   ISN 00894      350  CONTINUE
   ISN 00895           WRITE (OUTPUT,2114) LABL1(IXP+1),LABL1(IXP+1)
   ISN 00896     2114  FORMAT ('0  JUN.NO.'25X'INIT. LIQ.'A5,2X'INIT. VAP.'A5,2X
                     * 'INTERFACE VEL.')
   ISN 00897           IF (UNITO) GO TO 189
   ISN 00898           WRITE (OUTPUT,2115) LABL2(IXP+1),LABL2(IXP+1)
   ISN 00899     2115  FORMAT (35XA10,7XA10,7X'(FT/SEC)')
   ISN 00900           DO 355 I = IJS,IJE,IJSKP
               CX        IF (INIT(1) .NE. 0) GO TO 197
   ISN 00901 .         IF (INIT(2,1) .NE. 0) GO TO 197                                           XJA
   ISN 00902           XINIT(2) = VELFJ(I)/FT
   ISN 00903           XINIT(3) = VELGJ(I)/FT
   ISN 00904           GO TO 198
   ISN 00905      197  XINIT(2) = VELFJ(I)/XLBSEC
   ISN 00906           XINIT(3) = VELGJ(I)/XLBSEC
   ISN 00907      198  XINIT(4) = VELJ(I)/FT
               CX      WRITE (OUTPUT,2028) JUNNO(I),(XINIT(INF),INF=2,4)
   ISN 00908           WRITE (OUTPUT,2028) JUNNO(2,I),(XINIT(INF),INF=2,4)                       XJA
   ISN 00909      355  CONTINUE
   ISN 00910           GO TO 200
   ISN 00911      189  WRITE (OUTPUT,2116) LABL3(IXP+1),LABL3(IXP+1)
   ISN 00912     2116  FORMAT (35XA10,7XA10,7X'(M/SEC)')
               CX      WRITE (OUTPUT,2028) (JUNNO(I),VELFJ(I),VELGJ(I),VELJ(I),
               CX    * I=IJS,IJE,IJSKP)
   ISN 00913           WRITE (OUTPUT,2028) (JUNNO(2,I),VELFJ(I),VELGJ(I),VELJ(I),              XJA
                     * I=IJS,IJE,IJSKP)                                                        XJA
   ISN 00914     2028  FORMAT (I10,20X1P3E17.6)
   ISN 00915      200  CONTINUE                                                                  JETPMP
               C **WRITE JETPUMP MESSAGE                                                        JETPMP
   ISN 00916           IF(ITYPE.NE.14) GO TO 999                                                 JETPMP
               CX      LJP=.NOT.MASK(54).AND.SHIFT(VCTRL(IV),36)                                 JETPMP
   ISN 00917           LJP=IDAND(DNOT(DMASK(54)),SHIFT(VCTRL(IV),36))                            JETPMP
   ISN 00918           WRITE(OUTPUT,2049) LJP                                                    JETPMP
   ISN 00919     2049  FORMAT(1H0,14X,' NUMBER OF JET PUMPS MODELED BY THIS COMPONENT =' JETPMP
                     *  ,I6)                                                                   JETPMP
   ISN 00920           WRITE(OUTPUT,2050) (DIA(IL,NJP),RLENG(IL,NJP),IL=1,5)                     JETPMP
                     *                  ,DIA(6,NJP),DIA(7,NJP)                                 JETPMP
   ISN 00921     2050  FORMAT(1H0,20X,' ***GEOMETRIC DATA FOR JAERI JETPUMP MODEL***',         JETPMP
                     */10X,'   DIAMETERS (METERS)                    LENGTHS (METERS)'JETPMP
                     */8X,'SUCTION INLET(DIA0)',E12.5,5X,'DRIVE & SUCTION(LEN0)',E12.5,      JETPMP
                     */8X,'DRIVE INLET  (DIA1)',E12.5,5X,'DRIVE & SUCTION(LEN1)',E12.5,      JETPMP
                     */8X,'DRIVE OUTLET (DIA2)',E12.5,5X,'       SUCTION(LEN2)',E12.5,      JETPMP
                     */8X,'SUCTION OUTLT(DIA3)',E12.5,5X,'         MIXING (LEN3)',E12.5,      JETPMP
                     */8X,'MIX ZONE INLT(DIA4)',E12.5,5X,'      DIFFUSER(LEN4)',E12.5,      JETPMP
                     */8X,'MIX ZON OUTLT(DIA5)',E12.5,                                        JETPMP
                     */8X,'DIFFUSR OUTLT(DIA6)',E12.5     )                                   JETPMP
   ISN 00922           WRITE(OUTPUT,2052) (RAMDA(IL,NJP),IL=1,6)                                 JETPMP
   ISN 00923     2052  FORMAT(1H0,20X,' ***FRICTION FACTORS FOR JAERI JETPUMP MODEL***',      JETPMP
                     */8X,'WALL FRICTION AT DRIVE NOZZLE ZONE (LAMDA) =',1PE15.6,            JETPMP
                     */8X,'WALL FRICTION AT MIXING ZONE       (LAMM2) =',1PE15.6,            JETPMP
                     */8X,'INTERPHASE FRICTION AT SUCTION ZONE (LAMI) =',1PE15.6,            JETPMP
                     */8X,'WALL FRICTION AT DIFFUSER ZONE     (LAMDIF) =',1PE15.6,           JETPMP
                     */8X,'WALL FRICTION AT SUCTION1 ZONE     (LAMS1 ) =',1PE15.6,           JETPMP
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                    */8X,'WALL FRICTION AT SUCTION2 ZONE    (LAMS2 ) =',1PE15.6)          JETPMP
                  CVIF DEF,SCOPE3                                                         *IGNORED
                  C 999  IF (LCONTG(2) .GE. FILSIZ(4)) GO TO 201                          JETPMP
                  C      CALL DELETE (-FILID(4))                                          *IGNORED
                  C      FILSIZ(4) = 0                                                    *IGNORED
                  C      GO TO 202                                                        *IGNORED
                  C 201  CALL FTBRSV (FILID(4),FILSIZ(4),-2,FILNDX(4))                   *IGNORED
                  C      CALL WRITEC (FA(L),LFA(FILNDX(4)),FILSIZ(4))                     *IGNORED
                  C      CALL DELETE (-FILID(4))                                          *IGNORED
                  C      IF (LCONTG(2) .GE. FILSIZ(5)) GO TO 203                          *IGNORED
                  C 202  FILSIZ(5) = 0                                                    *IGNORED
                  C      CALL DELETE (-FILID(5))                                          *IGNORED
                  C      WRITE (OUTPUT,2029)                                              *IGNORED
                  C2029  FORMAT ('0******** INSUFFICIENT LCM TO PROCESS COMPONENT.')      *IGNORED
                  C      GO TO 204                                                        *IGNORED
                  C 203  CALL FTBRSV (FILID(5),FILSIZ(5),-2,FILNDX(5))                   *IGNORED
                  C      CALL WRITEC (FA(J),LFA(FILNDX(5)),FILSIZ(5))                     *IGNORED
                  C      CALL DELETE (-FILID(5))                                          *IGNORED
                  CENDIF                                                                  *IGNORED
                  CVIF DEF,SCOPE0                                                         *IGNORED
  ISN 00924         999  CALL FTBRSV (-FILID(4),FILSIZ(4),IU,FILNDX(4))                  JETPMP
  ISN 00925              CALL FTBOUT (IUD,FA(L),FILSIZ(4),FILNDX(4))
  ISN 00926              CALL DELETE (FILID(4))
  ISN 00927              CALL FTBRSV (-FILID(5),FILSIZ(5),IU,FILNDX(5))
  ISN 00928              CALL FTBOUT (IUD,FA(J),FILSIZ(5),FILNDX(5))
  ISN 00929              CALL DELETE (FILID(5))
  ISN 00930              CALL FTBCHK (IUD)
                  CENDIF                                                                  *IGNORED
  ISN 00931        1000  RETURN
```

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SPECIFIED OPTIONS: NONAME,FLAG(I),BYNAME,NOSTMT,NOSTATIS,ISN(0),NOMAP,ELM(*)

                  *DECK VEXPLT
  ISN 00001              SUBROUTINE VEXPLT                                               ########
                  *CALL DECLARE                                                           ########
                  C.....................RELAPS/MOD1 IS IMPLEMENTED ON A FACOM M-200 COMPUTER#
  ISN 00002              IMPLICIT REAL*8(A-H,O-Z)                                          AT  #
                  C.............................DECLARE FUNCTION(FOR PACKWORD) TYPE....  JAPAN#
  ISN 00003              REAL*8   DAND,DOR,DNOT,SHIFT,DMASK,XOR,DA00,DB1T,SHIFTD,SHIFTI    ATOMIC#
  ISN 00004              INTEGER  INTO,IDAND,ISHIFT,LO18                                   ENERGY#
  ISN 00005              LOGICAL  LLT,LLE,LEQ,LNE,LGT,LGE                                RESEARCH
                  C.....................................................................INSTITUTE
                  *CEND                                                                   DEVL END
                  C  COMPUTE TERMS FROM MOMENTUM EQUATIONS.
                  *CALL CMPDAC
                  C
                  C  ACCUMULATOR COMPONENT VARIABLES
                  C
                  C  TANK VARIABLES
                  C
  ISN 00006              REAL*8        DIALN(1),LNELV(1),THICK(1),LNLEN(1),TTANK(1),      #REAL*8#
                        *              TTANKO(1),THCND(1),HTCAP(1),RHOT(1),HTXR(1),QTANK(1),
                  C
                  C  HYDRODYNAMIC VARIABLES
                  C
                        *      VOM(1),VOMO(1),VLIQ(1),VLIQO(1),RHON(1),RHONO(1),
                        *      TVAPO(1),CVNIT(1),VMASSO(1),BETAV(1),DPD(1),DPDOP(1)
                  C#### INTEGER  ACCON(1)                                                ########
  ISN 00007              REAL*8   ACCON(1)                                               PACKWORD
                  C
  ISN 00008                EQUIVALENCE  ( DIALN  (1), FA ( 6))
  ISN 00009                EQUIVALENCE  ( LNELV  (1), FA ( 7))
  ISN 00010                EQUIVALENCE  ( THICK  (1), FA ( 8))
  ISN 00011                EQUIVALENCE  ( LNLEN  (1), FA ( 9))
  ISN 00012                EQUIVALENCE  ( TTANK  (1), FA (10))
  ISN 00013                EQUIVALENCE  ( TTANKO (1), FA (11))
  ISN 00014                EQUIVALENCE  ( THCND  (1), FA (12))
  ISN 00015                EQUIVALENCE  ( HTCAP  (1), FA (13))
  ISN 00016                EQUIVALENCE  ( RHOT   (1), FA (14))
  ISN 00017                EQUIVALENCE  ( HTXR   (1), FA (15))
  ISN 00018                EQUIVALENCE  ( QTANK  (1), FA (16))
  ISN 00019                EQUIVALENCE  ( VOM    (1), FA (17))
  ISN 00020                EQUIVALENCE  ( VOMO   (1), FA (18))
  ISN 00021                EQUIVALENCE  ( VLIQ   (1), FA (19))
  ISN 00022                EQUIVALENCE  ( VLIQO  (1), FA (20))
  ISN 00023                EQUIVALENCE  ( RHON   (1), FA (21))
  ISN 00024                EQUIVALENCE  ( RHONO  (1), FA (22))
  ISN 00025                EQUIVALENCE  ( TVAPO  (1), FA (23))
  ISN 00026                EQUIVALENCE  ( CVNIT  (1), FA (24))
  ISN 00027                EQUIVALENCE  ( VMASSO (1), FA (25))
  ISN 00028                EQUIVALENCE  ( BETAV  (1), FA (26))
  ISN 00029                EQUIVALENCE  ( DPD    (1), FA (27))
  ISN 00030                EQUIVALENCE  ( DPDOP  (1), FA (28))
  ISN 00031                EQUIVALENCE  ( ACCON  (1), FA (29))                           ##1A-FA#
                  C
                  *CEND                                                                   DEVL END
                  *CALL CMPDAT
                  C
```

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                C  DEFINITIONS COMMON TO ALL COMPONENTS
                C####  INTEGER NCMPS(1),CMPNUM(1),CMPNAM(1),CMPTYP(1),NVC(1),NJC(1)      ########
   ISN 00032           REAL*8  NCMPS(1),CMPNUM(1)                    ,NVC(1),NJC(1)      PACKWORD
   ISN 00033           REAL*8                    CMPNAM(1),CMPTYP(1)                     CHARACTR
   ISN 00034           EQUIVALENCE (NCMPS(1),FA(1)),(CMPNUM(1),FA(1)),                   ##IA-FA#
                      * (CMPNAM(1),FA(2)),(CMPTYP(1),FA(3)),(NVC(1),FA(6)),              ##IA-FA#
                      * (NJC(1),FA(5))                                                   ##IA-FA#
                C  DEFINITIONS FOR TIME DEPENDENT VOLUMES AND JUNCTIONS
                C####  INTEGER NCTTRP(1),NCTALF(1),NCTDPV(1),NCTPC(1),NCTBLE(1)          ########
   ISN 00035           REAL*8             NCTALF(1)                                      CHARACTR
   ISN 00036           INTEGER                        NCTDPV(2,1)                        INTEGER
   ISN 00037           REAL*8  NCTTRP(1),                          NCTPC(1),NCTBLE(1)    PACKWORD
   ISN 00038           REAL*8CMPTBL(1)                                                   #REAL*8#
   ISN 00039           EQUIVALENCE (NCTTRP(1),FA(6)),(NCTALF(1),FA(7)),                  ##IA-FA#
                      * (NCTDPV(1),FA(8)),(NCTPC(1),FA(9)),(NCTBLE(1),FA(10)),           ##IA-FA#
                      * (CMPTBL(1),FA(11))
                *CEND                                                                    DEVL END
                *CALL COMCTL
                C
   ISN 00040           COMMON /COMCTL/ COMDAT(30),FILID(30),FILSIZ(30),FILNDX(30),SAFE1
   ISN 00041           REAL*8          COMDAT                                            PACKWORD
   ISN 00042           INTEGER FILSIZ,FILNDX
   ISN 00043           LOGICAL NEWRST
   ISN 00044           EQUIVALENCE (SAFE1,NEWRST)
                *CEND                                                                    DEVL END
                *CALL CONTRL
                C
   ISN 00045           COMMON /CONTRL/ DTHY,DTNT,DTN,DT,PRINT,TIMEHY,TIMENT,ERRMAX,
                      * TMASS,TMASSO,EMASS,EMASSO,AFLAG,SUCCES,DONE,NCOUNT,NSTSP,NREPET,
                      * HELP,CPUREM(2),SAFE2
                C####  INTEGER PRINT,DONE,HELP,SUCCES                                    ########
   ISN 00046           INTEGER       DONE,HELP,SUCCES                                    INTEGER
   ISN 00047           REAL*8  PRINT                                                     PACKWORD
   ISN 00048           LOGICAL AFLAG,RENOD
   ISN 00049           EQUIVALENCE (SAFE2,RENOD)
                *CEND                                                                    DEVL END
                *CALL FAST
                C                                                                        LCM VERS
   ISN 00050           COMMON /FAST/ FA(100)                                             ION;DEFI
   ISN 00051           INTEGER IA(2,100)                                                 NE SCOPE
   ISN 00052           EQUIVALENCE (FA(1),IA(1))                                         O########
   ISN 00053           REAL*8 LFA(100)                                                   #REAL*8#
   ISN 00054           INTEGER LIA(2,100)
   ISN 00055           EQUIVALENCE (LFA(1),LIA(1),FA(1))
                *CEND                                                                    DEVL END
                *CALL GENRL
                C
                C####  COMMON /GENRL/ CTITLE(10),FAIL,IROUTE,NCASE,PTITLE(7),            ########
   ISN 00056           COMMON /GENRL/ CTITLE(12),FAIL,IROUTE,NCASE,PTITLE(9),            CHARACTR
                      * UNITI,UNITO,SAFE3
                C####  INTEGER CTITLE,PTITLE                                             ########
   ISN 00057           REAL*8  CTITLE,PTITLE                                             CHARACTR
   ISN 00058           REAL*8                 IROUTE                                     PACKWORD
   ISN 00059           LOGICAL FAIL,UNITI,UNITO
                *CEND                                                                    DEVL END
                *CALL HYSOL
                C
                C  HYDRODYNAMIC SOLUTION ARRAY BLOCK
```

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                C####  INTEGER IPC(1),IPR(1),IRNR(1),IRNC(1)                            ########
   ISN 00060           INTEGER IPC(2,1),     IRNR(2,1)                                   INTEGER
   ISN 00061           INTEGER                      IRNC(2,1)                            INTEGER
   ISN 00062           REAL*8          IPR(1)                                            PACKWORD
   ISN 00063           REAL*8COEFP(1),COEFX(1),V(1),SOURCP(1),SOURCE(1),SOURCM(1),       #REAL*8#
                      * SOURCQ(1),VFDP(1),VGDP(1),PCEF(1),PCEG(1),PCMF(1),PCMG(1)
                      *  ,PCMA(1),SOURCA(1)
                C####  EQUIVALENCE ((A(1),IPC(1),IPR(1),IRNR(1),IRNC(1)),                ########
   ISN 00064           EQUIVALENCE ((A(1),IPC(1),       IRNR(1),IRNC(1))                 INTEGER
   ISN 00065           EQUIVALENCE (FA(1),      IPR(1)              ),                   PACKWORD
                      * (FA(1),COEFP(1),COEFX(1),SOURCP(1),SOURCE(1),V(1),VFDP(1),
                      *  PCEF(1)),
                      * (FA(2),SOURCM(1),VGDP(1),PCEG(1)),(FA(3),SOURCQ(1),PCMF(1)),
                      *  ( FA(4), PCMG(1), SOURCA(1)),
                      *  ( FA(5), PCMA(1))
                *CEND                                                                    DEVL END
                *CALL INVTBL
                C####  INTEGER INVCNT(1),INVJUN(1)                                       ########
   ISN 00066           INTEGER INVCNT(2,1)                                               INTEGER
   ISN 00067           REAL*8            INVJUN(1)                                       PACKWORD
   ISN 00068           REAL*8XNVJUN(1)                                                   #REAL*8#
   ISN 00069           EQUIVALENCE (INVCNT(1),FA(1)),(INVJUN(1),FA(1))                   ##IA-FA#
   ISN 00070           EQUIVALENCE (INVJUN(1), XNVJUN(1))
                *CEND                                                                    DEVL END
                *CALL JUNDAT
                C
                C  JUNCTION BLOCK
   ISN 00071           REAL*8AJUN(1),FIJ(1),FORMFJ(1),FORMGJ(1),FIJO(1),                 #REAL*8#
                      * RHOFJ(1),RHOGJ(1),UFJ(1),UGJ(1),VELFJ(1),
                      * VELGJ (1), VELJ  (1), VELFJO(1), VELGJO(1), VELJO (1), VOIDFJ(1),
                      * VOIDGJ(1), FJUNF (1), FJUNR (1), DIAMJ (1), ATHRDT(1), VOIDO (1),
                      *  VOIDT(1),ARAT(2),FAAJ(1),MFLOWJ(1),CCAJ(1)
                C####  INTEGER NJUNS(1),NJSKP(1),IJ1(1),IJ2(1),IMREG(1),JC(2),JUNNO(1),  ########
                C####* JUNFTL(1)                                                         ########
   ISN 00072           INTEGER NJUNS(2,1)                                                INTEGER
   ISN 00073           INTEGER          NJSKP(2,1),                          JUNNO(2,1)INTEGER
   ISN 00074           REAL*8                    IJ1(1),IJ2(1),IMREG(1),JC(2),           PACKWORD
                      * JUNFTL(1)                                                        PACKWORD
                C
   ISN 00075           EQUIVALENCE    ( NJUNS (1),FA( 1) )                              ##IA-FA#
   ISN 00076           EQUIVALENCE    ( NJSKP (1),FA( 2) )                              ##IA-FA#
   ISN 00077           EQUIVALENCE    ( IJ1   (1),FA( 3) )                              ##IA-FA#
   ISN 00078           EQUIVALENCE    ( IJ2   (1),FA( 4) )                              ##IA-FA#
   ISN 00079           EQUIVALENCE    ( AJUN  (1),FA( 5) )
   ISN 00080           EQUIVALENCE    ( FIJ   (1),FA( 6) )
   ISN 00081           EQUIVALENCE    ( FJUNF (1),FA( 7) )
   ISN 00082           EQUIVALENCE    ( FJUNR (1),FA( 8) )
   ISN 00083           EQUIVALENCE    ( FORMFJ(1),FA( 9) )
   ISN 00084           EQUIVALENCE    ( FORMGJ(1),FA(10) )
   ISN 00085           EQUIVALENCE (IMREG(1),FA(11))                                    ##IA-FA#
   ISN 00086           EQUIVALENCE (FIJO(1),FA(12))
   ISN 00087           EQUIVALENCE    ( RHOFJ (1),FA(13) )
   ISN 00088           EQUIVALENCE    ( RHOGJ (1),FA(14) )
   ISN 00089           EQUIVALENCE    ( UFJ   (1),FA(15) )
   ISN 00090           EQUIVALENCE    ( UGJ   (1),FA(16) )
   ISN 00091           EQUIVALENCE    ( VELFJ (1),FA(17) )
   ISN 00092           EQUIVALENCE    ( VELGJ (1),FA(18) )
   ISN 00093           EQUIVALENCE    ( VELJ  (1),FA(19) )
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ISN 00094              EQUIVALENCE     ( VELFJO(1),FA(20) )
ISN 00095              EQUIVALENCE     ( VELGJO(1),FA(21) )
ISN 00096              EQUIVALENCE     ( VELJO (1),FA(22) )
ISN 00097              EQUIVALENCE     ( VOIOFJ(1),FA(23) )
ISN 00098              EQUIVALENCE     ( VOIDGJ(1),FA(24) )
ISN 00099              EQUIVALENCE     ( DIAMJ (1),FA(25) )
ISN 00100              EQUIVALENCE     ( JC    (1),FA(26) )                                          #RIA-FA#
                C      JC USES TWO WORDS.
ISN 00101              EQUIVALENCE     ( JUNNO (1),FA(28) )                                          #RIA-FA#
ISN 00102              EQUIVALENCE     ( ATHROT(1),FA(29) )
ISN 00103              EQUIVALENCE     ( VOIDO (1),FA(30) )
ISN 00104              EQUIVALENCE     ( VOIDT (1),FA(31) )
ISN 00105              EQUIVALENCE     ( ARAT  (1),FA(32) )
                C  ARAT USES TWO WORDS
ISN 00106              EQUIVALENCE     ( FAAJ  (1),FA(34) )
ISN 00107             EQUIVALENCE (MFLOWJ(1),FA(35))
ISN 00108              EQUIVALENCE     ( CCAJ  (1), FA(36) )
ISN 00109             EQUIVALENCE (JUNFTL(1),FA(37))                                                 #RIA-FA#
                                                                                                      DEVL END
                *CEND
                *CALL STATC
                C
                C####  INTEGER STSNDC(1),STSSKP(1),STSJPT(1),STSATP(1),STSREQ(1),                    ########
                C#   * STSLTE(1),STSSCL(1),STSRCL(1),STSRXL(1),STSREX(1),                                P
                C####* STSRTE(1),STSRPE(1),STSJCK(1)                                                   ########
ISN 00110              INTEGER          STSSKP(2,1)          ,STSATP(2,1)                           INTEGER
ISN 00111              INTEGER                    STSJPT(2,1)          ,STSREQ(2,1)                  INTEGER
ISN 00112              REAL*8  STSNDC(1),,                                                            PACKWORD
                     * STSLTE(1),STSSCL(1),STSRCL(1),STSRXL(1),STSREX(1),                             PACKWORD
                     * STSRTE(1),STSRPE(1),STSJCK(1)                                                 PACKWORD
ISN 00113              REAL*8STSCPU(1),STSDTM(1),STSDTX(1),STSOTA(1)                                  #REAL*8#
ISN 00114              EQUIVALENCE (STSNDC(1),LFA(1)),(STSSKP(1),LFA(2)),                             #LIA-LFA
                     * (STSJPT(1),LFA(3)),(STSATP(1),LFA(4)),(STSREQ(1),LFA(5)),                      #LIA-LFA
                     * (STSCPU(1),LFA(6)),(STSDTM(1),LFA(7)),(STSDTX(1),LFA(8)),
                     * (STSOTA(1),LFA(9)),(STSLTE(1),LFA(10)),(STSSCL(1),LFA(11)),                    #LIA-LFA
                     * (STSRCL(1),LFA(12)),(STSRXL(1),LFA(13)),(STSREX(1),LFA(14)),                   #LIA-LFA
                     * (STSRTE(1),LFA(15)),(STSRPE(1),LFA(16)),(STSJCK(1),LFA(17))                    #LIA-LFA
                                                                                                      DEVL END
                *CEND
                *CALL TRNHLP
                C
ISN 00115              COMMON /TRNHLP/ IC,IV,IVE,IVSKP,IJ,IJE,IJSKP,IXLP,IXW,IXPC,
                     * IXIRNR,IXIRN,IXCOFP,IXCOFE,IXCOFX,IXSOE,IXSOP,IXSOPE,IXVP,
                     * KVR,MVRP,MNZ,MNZZ,GERR,GERRS,MTYPE,SFLAG,IHT,INTE,LNTSOL
ISN 00116              LOGICAL SFLAG
ISN 00117              EQUIVALENCE (IXIPR,FILNOX(7))
                                                                                                      DEVL END
                *CEND
                *CALL VOLOAT
                C
                C  VOLUME BLOCK
ISN 00118              REAL*8DIAMV(1),DMOP(1),DMORU(1),DMOX(1),DOTM(1),DROP(1),                       #REAL*8#
                     * DRORU(1),DROX(1),
                     * P     (1), PO    (1), Q     (1), QUALE (1), QUALS (1), QUALSO(1),
                     * RHO   (1), RHOF  (1), RHOG  (1), RHOM  (1), RHOO  (1), U     (1),
                     * UF    (1), UG    (1), UO    (1), V     (1), VELF  (1), VELG  (1),
                     * VNEW  (1), VOIOF (1), VOIDG (1), TEMP  (1), ROUGHV(1), AVOL  (1),
                     * TEMPF(1),TEMPG(1),DZ(1),DL(1),SOUNDE(1),
                     * FVALF (1), FVALG (1), SATT  (1), SATVF (1), SATVG (1),
                     * SATHF(1), SATHG(1), SATCPF(1), SATCPG(1), CPSPH(1),
                     * FAAV(1),VISCF(1),VISCG(1),SIGMA(1),QUALA(1),QUALAD(1),


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                     * DRDA(1),DMDA(1),BORON(1),BORONO(1),DOTMO(1)
                C####  INTEGER NVOLS(1),NVSKP(11),VCTRL(1),VOLNO(1),IMAP(1)                           ########
ISN 00119              INTEGER NVOLS(2,1)                                                             INTEGER
ISN 00120              INTEGER          NVSKP(2,11),        VOLNO(2,1)                                INTEGER
ISN 00121              REAL*8                       VCTRL(1),          IMAP(1)                       PACKWORD
                C
ISN 00122               EQUIVALENCE     ( NVOLS (1),FA( 1) )                                          #RIA-FA#
ISN 00123               EQUIVALENCE     ( NVSKP (1),FA( 2) )                                          #RIA-FA#
ISN 00124               EQUIVALENCE     ( ROUGHV(1),FA( 3) )
ISN 00125               EQUIVALENCE     ( DIAMV (1),FA( 4) )
ISN 00126               EQUIVALENCE     ( DMOP  (1),FA( 5) )
ISN 00127               EQUIVALENCE     ( DMORU (1),FA( 6) )
ISN 00128               EQUIVALENCE     ( DMOX  (1),FA( 7) )
ISN 00129               EQUIVALENCE     ( DOTM  (1),FA( 8) )
ISN 00130               EQUIVALENCE     ( SOUNDE(1),FA( 9) )
ISN 00131               EQUIVALENCE     ( VCTRL (1),FA(10) )                                          #RIA-FA#
ISN 00132               EQUIVALENCE     ( DROP  (1),FA(11) )
ISN 00133               EQUIVALENCE     ( DRORU (1),FA(12) )
ISN 00134               EQUIVALENCE     ( DROX  (1),FA(13) )
ISN 00135               EQUIVALENCE     ( VOLNO (1),FA(14) )                                          #RIA-FA#
ISN 00136               EQUIVALENCE     ( P     (1),FA(15) )
ISN 00137               EQUIVALENCE     ( QUALS (1),FA(16) )
ISN 00138               EQUIVALENCE     ( U     (1),FA(17) )
ISN 00139               EQUIVALENCE     ( TEMP  (1),FA(18) )
ISN 00140               EQUIVALENCE     ( RHO   (1),FA(19) )
ISN 00141               EQUIVALENCE     ( PO    (1),FA(20) )
ISN 00142               EQUIVALENCE     ( QUALSO(1),FA(21) )
ISN 00143               EQUIVALENCE     ( UO    (1),FA(22) )
ISN 00144               EQUIVALENCE     ( RHOO  (1),FA(23) )
ISN 00145               EQUIVALENCE     ( RHOM  (1),FA(24) )
ISN 00146               EQUIVALENCE     ( QUALE (1),FA(25) )
ISN 00147               EQUIVALENCE     ( RHOF  (1),FA(26) )
ISN 00148               EQUIVALENCE     ( RHOG  (1),FA(27) )
ISN 00149               EQUIVALENCE     ( UF    (1),FA(28) )
ISN 00150               EQUIVALENCE     ( UG    (1),FA(29) )
ISN 00151               EQUIVALENCE     ( V     (1),FA(30) )
ISN 00152               EQUIVALENCE     ( VNEW  (1),FA(31) )
ISN 00153               EQUIVALENCE     ( VELF  (1),FA(32) )
ISN 00154               EQUIVALENCE     ( VELG  (1),FA(33) )
ISN 00155               EQUIVALENCE     ( VOIOF (1),FA(34) )
ISN 00156               EQUIVALENCE     ( VOIDG (1),FA(35) )
ISN 00157               EQUIVALENCE     ( AVOL  (1),FA(36) )
ISN 00158               EQUIVALENCE     ( TEMPF (1),FA(37) )
ISN 00159               EQUIVALENCE     ( TEMPG (1),FA(38) )
ISN 00160               EQUIVALENCE     ( DZ    (1),FA(39) )
ISN 00161               EQUIVALENCE     ( DL    (1),FA(40) )
ISN 00162               EQUIVALENCE     ( Q     (1),FA(41) )
ISN 00163              EQUIVALENCE (IMAP(1),FA(42))                                                   #RIA-FA#
ISN 00164               EQUIVALENCE     ( FVALF (1), FA(43) )
ISN 00165               EQUIVALENCE     ( FVALG (1), FA(44) )
ISN 00166               EQUIVALENCE     ( SATT  (1),FA(45) )
ISN 00167               EQUIVALENCE     ( SATVF (1),FA(46) )
ISN 00168               EQUIVALENCE     ( SATVG (1),FA(47) )
ISN 00169               EQUIVALENCE     ( SATHF (1),FA(48) )
ISN 00170               EQUIVALENCE     ( SATHG (1),FA(49) )
ISN 00171               EQUIVALENCE     ( SATCPF(1),FA(50) )
ISN 00172               EQUIVALENCE     ( SATCPG(1),FA(51) )
ISN 00173               EQUIVALENCE     ( CPSPH (1),FA(52) )
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   ISN 00174            EQUIVALENCE     ( FAAV  (1),FA(53) )
   ISN 00175            EQUIVALENCE    ( VISCF (1),FA(54) )
   ISN 00176            EQUIVALENCE    ( VISCG (1),FA(55) )
   ISN 00177            EQUIVALENCE    ( SIGMA (1),FA(56) )
   ISN 00178            EQUIVALENCE    ( QUALA (1), FA(57) )
   ISN 00179            EQUIVALENCE    ( QUALAO(1), FA(58) )
   ISN 00180            EQUIVALENCE    ( DRDA  (1), FA(59) )
   ISN 00181            EQUIVALENCE    ( DMDA  (1), FA(60) )
   ISN 00182            EQUIVALENCE    (BORON(1)  , FA(61)  )
   ISN 00183            EQUIVALENCE    (BORONO(1) , FA(62)  )
   ISN 00184            EQUIVALENCE    (DOTMO(1)  , FA(63) )
                 C  ADDITIONAL VARIBLES FOR TIME DEPENDENT VOLUMES.
   ISN 00185           REAL*8DP(1), DPO(1)                                          #REAL*8#
   ISN 00186           EQUIVALENCE  (DP(1),DMDX(1)), (DPO(1),DOTM(1))
                 *CEND                                                              DEVL END
                 *CALL VXPHLP
   ISN 00187            REAL*8DIFVF(1),DIFVG(1),SUMVF(1),SUMVG(1),DXUP(1)           #REAL*8#
   ISN 00188            REAL*8DIFSTF(1),PHACCM(1)                                   #REAL*8#
   ISN 00189            EQUIVALENCE    ( DIFVF (1),FA( 1) ), ( DIFVG (1),FA( 2) )
   ISN 00190            EQUIVALENCE    ( SUMVF (1),FA( 3) ), ( SUMVG (1),FA( 4) )
   ISN 00191            EQUIVALENCE (DXUP(1),FA(1)),(DIFSTF(1),FA(1))
   ISN 00192            EQUIVALENCE (PHACCM(1),FA(1))
                 *CEND                                                              DEVL END
                 C
                 C  LOCAL VARIABLES
                 C  EQUIVALENCE TO ALLOW JC (OF JUNCTION BLOCK) TO BE USED IN SIGN
                 C  FUNCTION.
                 C#      REAL XJC(2)
   ISN 00193             REAL*8 XJC(2)                                              #JA
   ISN 00194             EQUIVALENCE (JC(1),XJC(1))
                 C
   ISN 00195          EQUIVALENCE (IXE,K4,KX,L4,LX),(AJOT,DELPZ),(DET,DXX)
   ISN 00196          EQUIVALENCE (PVTERM,RHOFGA),(DISPK,FLOSSF),(DISPL,FLOSSG)
   ISN 00197          EQUIVALENCE (PSLD,VVF),(PSMF,VVG),(PSMG,VVGF)
   ISN 00198          EQUIVALENCE (DIFR,PLL),(DIFP,VIRMAS),(HLOSSF,HLSF)
   ISN 00199          EQUIVALENCE (HLOSSG,HLSG)
                 C###  INTEGER IHDFMT(4), HEADLN, OUTPUT                            ########
   ISN 00200          INTEGER              HEADLN, OUTPUT                           INTEGER
   ISN 00201          REAL*8  IHDFMT(5)                                             CHARACTR
   ISN 00202          COMMON/JPDATA/NJP,NOCOM(4),DIA(7,4),RLENG(5,4),RAMDA(6,4),DUMMYY  JETPMP ← 追加 ジェットポンプデータを最大6個
   ISN 00203          COMMON/JPUMP/DIAJP(7),RLJP(5),RAMJP(6),DUMXXX                 JETPMP      Storeする, Sub. JETPには
                 C&    DATA OUTPUT/6LOUTPUT/                                                    COMMON /JPUMP/を介して渡される.
   ISN 00204          DATA OUTPUT/6       /                                         &JA
                 C#    DATA IHDFMT(1)/40H(*OTERMS COMPUTED INTERNAL TO VEXPLT*)  /
   ISN 00205          DATA IHDFMT   /40H(*OTERMS COMPUTED INTERNAL TO VEXPLT*)  /   ###
                 C
                 C  INITIALIZE MASS, ENERGY, AND QUALITY CONVECTIVE TERMS
   ISN 00206          IXE  =  IXSOE
   ISN 00207          DO  60 I = IV, IVE, IVSXP
                 C*      IF ( VCTRL(I) .LT. 0 )  GO TO  60
   ISN 00208            IF (LLT(VCTRL(I),DBIT(0)))  GO TO  60                       *JA
   ISN 00209            SOURCE(IXE)=  Q(I)*DT
                 CX      SOURCM(IXE)=  0.0
   ISN 00210            SOURCM(IXE)=  0.0D0                                         XJA
                 CX      SOURCQ(IXE)=  0.0
   ISN 00211            SOURCQ(IXE)=  0.0D0                                         XJA
                 CX      SOURCA(IXE)=  0.0
   ISN 00212            SOURCA(IXE)=  0.0D0                                         XJA


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   ISN 00213            IXE  =  IXE + 4
   ISN 00214       60 CONTINUE
   ISN 00215            IF (HELP .EQ. 0) GO TO 97
                 C ********************************************************************
                 C
                 C       CALL DIAGNOSTIC HEADER
   ISN 00216          CALL HELPHD('VEXPLT',IHDFMT(1),MAXO(0,ISIGN(1,(5-HEADLN(0)))))
   ISN 00217          WRITE(OUTPUT, 1904)
   ISN 00218     1904 FORMAT('0  JUN.NO.  SUMF'9X'SUMG'9X'SUMOLD'7X'DIFF'9X'DIFG',
                    1         9X'DIFOLD'7X'AVRG'9X'AVRF'9X'FIF')
   ISN 00219       97 CONTINUE
                 C  LOOP OVER ALL JUNCTIONS
   ISN 00220          J            =  IXVF
   ISN 00221          IX   =   IXCOFP
   ISN 00222           I = IJ
   ISN 00223           N = IC
                 C*       NC = NCMPS(N-1)
   ISN 00224           NC = IDIB(NCMPS(N-1))                                        ###
   ISN 00225           DO 1010 NX = 1,NC
                 CX        PH = 0.0
   ISN 00226             PH = 0.0D0                                                 XJA
                 C*        ITYPE = .NOT.MASK(49) .AND. SHIFT(CMPNUM(N),12)
   ISN 00227             ITYPE = IDAND(DNOT(DMASK(49)),SHIFT(CMPNUM(N),12))         *JA
   ISN 00228          NUMC=IDAND(DNOT(DMASK(30)),CMPNUM(N))                         JETPMP ― 追加 NUMC:コンポーネント番号
   ISN 00229           IF ( ITYPE .NE. 4 )  GO TO  50
   ISN 00230           CALL PUMP(N,PH,ANGMM)
                 C*       IVL  =  .NOT.MASK(43) .AND. SHIFT(NVC(N),36)
   ISN 00231           IVL = IDAND(DNOT(DMASK(43)),SHIFT(NVC(N),36))                *JA
                 C*       IVS  =  .NOT.MASK(43) .AND. SHIFT(JC(I+1),24)
   ISN 00232           IVS = IDAND(DNOT(DMASK(43)),SHIFT(JC(I+1),24))               *JA
                 CX       SOURCE(IVS) = (ANGMM - 2.0*PH*(VOIDF(IVL)*RHOF(IVL)*VELF(IVL)
                 CX   *      + VOIDG(IVL)*RHOG(IVL)*VELG(IVL))*AVOL(IVL)/RHOO(IVL))*DT
                 CX   *      + SOURCE(IVS)
   ISN 00233          SOURCE(IVS) = (ANGMM - 2.0D0*PH*(VOIDF(IVL)*RHOF(IVL)*VELF(IVL)  XJA
                     &       + VOIDG(IVL)*RHOG(IVL)*VELG(IVL))*AVOL(IVL)/RHOO(IVL))*DT  XJA
                     &       + SOURCE(IVS)                                              XJA
   ISN 00234            GO TO 51
   ISN 00235       50   IF ( ITYPE .NE. 13 )  GO TO  51
                 C*        K          = .NOT.MASK(43) .AND. SHIFT(IJ1(I),18)
   ISN 00236            K = IDAND(DNOT(DMASK(43)),SHIFT(IJ1(I),18))                 *JA
                 C*        L          = .NOT.MASK(43) .AND. SHIFT(IJ2(I),18)
   ISN 00237            L = IDAND(DNOT(DMASK(43)),SHIFT(IJ2(I),18))                 *JA
   ISN 00238            CALL ACCUM(N,K,L,1,J)
                 C*.       IF(SHIFT(ACCON(N),2).LT.0) GO TO 145
   ISN 00239            IF(LLT(SHIFT(ACCON(N),2),DBIT(0))) GO TO 145                *JA
                 C*       IF (VCTRL(L) .LT. 0) GO TO 52
   ISN 00240           IF (LLT(VCTRL(L),DBIT(0))) GO TO 52                          *JA
                 C*       LX = .NOT.MASK(43) .AND. SHIFT(JC(I+1),24)
   ISN 00241           LX = IDAND(DNOT(DMASK(43)),SHIFT(JC(I+1),24))                *JA
   ISN 00242           SOURCE(LX) = SOURCE(LX) + PO(L)*VOIDFJ(I)*VELFJO(I)*AJUN(I)*DT
   ISN 00243       52  I = I + IJSKP
   ISN 00244            J          =  J + 2
   ISN 00245            IX= IX+3
   ISN 00246            GO TO  1009
                 C*145    IF(SHIFT(JC(I),1).LT.0) JC(I)=SHIFT(.NOT.MASK(1),59)
                 C*   *       .AND. JC(I)
   ISN 00247      145   IF(LLT(SHIFT(JC(I),1),DBIT(0))) JC(I) = DAND(SHIFT(DNOT(DMASK(1)*JA
                    *),59),JC(I))                                                  *JA
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               CX 51    NJ          = .NOT.MASK(48) .AND. NJC(N)
  ISN 00248        51   NJ = IDAND(DNOT(DMASK(48)),NJC(N))                              XJA
  ISN 00249            IF (NJ .EQ. 0) GO TO 1009
  ISN 00250            DO 1000 JK = 1,NJ
               C
  ISN 00251             PHACCM(IX+2)=PH
               C  GET CELL INDEX OF VUMES CONNECTED TO JUNCTION I
               CX           K            =  .NOT. MASK(43) .AND. SHIFT(IJ1(I),18)
  ISN 00252             K = IDAND(DNOT(DMASK(43)),SHIFT(IJ1(I),18))                    XJA
               CX           L            =  .NOT. MASK(43) .AND. SHIFT(IJ2(I),18)
  ISN 00253             L = IDAND(DNOT(DMASK(43)),SHIFT(IJ2(I),18))                    XJA
  ISN 00254            IF(ITYPE.NE.14) GO TO 33                                         JETPMP
  ISN 00255            IF(JX.NE.1) GO TO 32                                             JETPMP
  ISN 00256            KDR=K                                                            JETPUMP ← 追加 Drive側のVolume
  ISN 00257            PRES1=P(K)                                                       JETPMP          インデックスを保存する。
               CX      NJETP=.NOT.MASK(54).AND.SHIFT(VCTRL(L),36)                       JETPMP
  ISN 00258            NJETP=IDAND(DNOT(DMASK(54)),SHIFT(VCTRL(L),36))                  JETPMP
  ISN 00259            XJETP=NJETP                                                      JETPMP
  ISN 00260            WD=(VOIDGJ(I)*RHOGJ(I)*VELGJ(I)                                  JETPMP
                     *   +VOIDFJ(I)*RHOFJ(I)*VELFJ(I)    )*AJUN(I)                       JETPMP
               C GET FLOWRATE FOR SINGLE JETPUMP IF COMPONENT COMBINES SEVERAL JETPUMPSJETPMP
               C DO THIS BECAUSE SUBROUTINE JETP IS FOR SINGLE JET PUMP.                JETPMP
  ISN 00261            WD=WD/XJETP                                                      JETPMP
  ISN 00262       32   CONTINUE                                                         JETPMP
               C                                                                        JETPMP
  ISN 00263            IF(JX.NE.2) GO TO 34                                             JETPMP
  ISN 00264            PRESO=P(K)                                                       JETPMP
  ISN 00265            RHOSUC=RHO(K)                                                    JETPMP
  ISN 00266            NOJETP=0                                                         JETPMP
  ISN 00267            IF(VOIDG(K).GT.0.00) NOJETP=1                                    JETPMP
  ISN 00268            IF(VELFJ(I).LT.0.0 .OR. VELFJ(I-IJSKP).LT.0.0) NOJETP=1          JETPMP
  ISN 00269            IF(NOJETP.EQ.1) GO TO 33                                         JETPMP
               CX      LDIS=.NOT.MASK(43).AND.SHIFT(IJ2(I+IJSKP),18)                    JETPMP
  ISN 00270            LDIS=IDAND(DNOT(DMASK(43)),SHIFT(IJ2(I+IJSKP),18))               JETPMP
               C LDIS IS INDEX OF VOLUME JETPUMP DISCHARGES INTO                        JETPMP
  ISN 00271            PRES6=P(LDIS)                                                    JETPMP
  ISN 00272            WSO=(RHOFJ(I)*VELFJ(I)*VOIDFJ(I)                                 JETPMP
                     *    +RHOGJ(I)*VELGJ(I)*VOIDGJ(I))*AJUN(I)                          JETPMP
  ISN 00273            WSO=WSO/XJETP                                                    JETPMP
               C**** PICK UP COMMON DATA TO JPUMP FROM JPDATA FOR JETPUMP GEOMETRY      JETPMP ┐
               C        AND WALL FRICTION DATA.                                         JETPMP │
  ISN 00274            DO 3000 IL=1,NJP                                                 JETPMP │
  ISN 00275            IXX=IL                                                           JETPMP │
  ISN 00276            IF(NOCOM(IL).EQ.NUMC) GO TO 3100                                 JETPMP │
  ISN 00277      3000 CONTINUE                                                          JETPMP │
  ISN 00278      3100 DO 3200 IL=1,7                                                    JETPMP │追加 該当するジェットポンプのコンポーネント
  ISN 00279            DIAJP(IL)=DIA(IL,IXX)                                            JETPMP │     に対して、COMMON/JPDATA/から
  ISN 00280      3200 CONTINUE                                                          JETPMP │     COMMON/JPUMP/ へデータを受け
  ISN 00281            DO 3300 IL=1,5                                                   JETPMP │     渡す。
  ISN 00282            RLJP(IL)=RLENG(IL,IXX)                                           JETPMP │
  ISN 00283      3300 CONTINUE                                                          JETPMP │
  ISN 00284            DO 3400 IL=1,6                                                   JETPMP │
  ISN 00285            RAMJP(IL)=RAMDA(IL,IXX)                                          JETPMP │
  ISN 00286      3400 CONTINUE                                                          JETPMP ┘
               CCC     WRITE(6,9019) NUMC
               C9019 FORMAT(1H0,'********  COMPONENT NO. =',I5)
  ISN 00287            CALL JETP(RHOSUC,PRESO,PRES1,PRES6,WD,WS,WSO,WDIS)               JETPMP
  ISN 00288            P(KDR)=PRES1                                                     JETPUMP ← 追加 Sub.JETPで得られた
                                                                                                       Drive側圧力を圧力
                                                                                                       テーブルにセットする。
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               C HELP IS SET TO -5 IF JETP HAS ERROR EXIT                               JETPMP
               C IN THIS CASE RETURN TO HYDRO THEN TRAN THEN DTSTEP TO                  JETPMP
               C WRAP UP CALUCTION.                                                     JETPMP
  ISN 00289            IF(HELP.EQ.-5) RETURN                                            JETPMP
               C                                                                        JETPMP
               C JETP GIVES WS, THIS SUCTION FLOWRATE FOR SINGLE JETPUMP.BUT, RELAPS    JETPMP
               C NEEDS VELOCITY FOR SET OF JET PUMPS WHICH COMPONENT MODELS             JETPMP
               C                                                                        JETPMP
  ISN 00290            WS=WS*XJETP                                                      JETPMP
  ISN 00291            VELFJ(I)=WS/( RHOSUC*AJUN(I) )                                   JETPMP
  ISN 00292            VELGJ(I)=VELFJ(I)                                                JETPMP
  ISN 00293            VFDP(J)=0.0                                                      JETPMP
  ISN 00294            VGDP(J)=0.0                                                      JETPMP
  ISN 00295            GO TO 900                                                        JETPMP
               C                                                                        JETPMP
  ISN 00296       34   CONTINUE                                                         JETPMP
  ISN 00297            IF(JX.NE.3) GO TO 33                                             JETPMP
  ISN 00298            IF(NOJETP.EQ.1) GO TO 33                                         JETPUMP ← 追加 NOJETPはSub.JETPが呼ば
               C                                                                        JETPMP          れる条件を
               C GET HERE FOR 3RD JUNCTION(DISCHARGE OF JETPUMP)                        JETPMP
               C                                                                        JETPMP
  ISN 00299            WDIS=WDIS*XJETP                                                  JETPUMP ┐
  ISN 00300            VELFJ(I)=WDIS/(RHO(K)*AJUN(I))                                   JETPUMP │追加 Sub.JETPから得られた
  ISN 00301            VELGJ(I)=VELFJ(I)                                                JETPUMP │     Dischargeの流量を速度
  ISN 00302            VFDP(J)=0.0                                                      JETPUMP │     に変換して速度テーブルに
  ISN 00303            VGDP(J)=0.0                                                      JETPUMP ┘     セットする。
  ISN 00304       33   CONTINUE                                                         JETPMP
               C
               C  THE MOMENTUM EQUATIONS ARE WRITTEN AS A SUM AND DIFFERENCE EQU.
               C  THE SUM EQUATION IS OF THE FORM
               C  SUMF*(VEL. LIQUID AT NEW TIME) + SUMG*(VEL. GAS AT NEW TIME)
               C  = ALL OLD TIME TERMS(SUMOLD)
               C  THE DIFFERENCE EQUATION IS OF THE FORM
               C  DIFF*(VEL. LIQUID AT NEW TIME) + DIFG*(VEL. GAS AT NEW TIME)
               C  =ALL OLD TIME TERMS(DIFOLD)
               C  GENERAL VALUES NEEDED IN THE CALCULATION
               CX          DXK        =  0.5*DL(K)
  ISN 00305                DXK        =  0.5D0*DL(K)                                    XJA
               CX          DXL        =  0.5*DL(L)
  ISN 00306                DXL        =  0.5D0*DL(L)                                    XJA
  ISN 00307                DX         =  DXK + DXL
               CX          DXX        =  1./DX
  ISN 00308                DXX        =  1.00/DX                                        XJA
  ISN 00309                VOIDFA     = (VOIDF(K)*DXK + VOIDF(L)*DXL)*DXX
  ISN 00310                VOIDGA     = (VOIDG(K)*DXX + VOIDG(L)*DXL)*DXX
  ISN 00311                RHOFA      = (RHOF(K)*DXK + RHOF(L)*DXL)*DXX
  ISN 00312                RHOGA      = (RHOG(K)*DXK + RHOG(L)*DXL)*DXX
               C
               C            AVERAGE OF (VOID*RHO) FOR THE JUNCTION
  ISN 00313                AVRF       =  VOIDFA*RHOFA
  ISN 00314                AVRG       =  VOIDGA*RHOGA
  ISN 00315            AVRHO=AVRF+AVRG
               C
               CX      IF(SHIFT(JC(I),2).GE.0) GO TO 112
  ISN 00316            IF(LGE(SHIFT(JC(I),2),OBIT(0))) GO TO 112                        XJA
               CX      AVK=AJUN(I)/AMAX1(AJUN(I),AVOL(K)*ARAT(I))
  ISN 00317            AVK=AJUN(I)/DMAX1(AJUN(I),AVOL(K)*ARAT(I))                       XJA
               CX      AVL=AJUN(I)/AMAX1(AJUN(I),AVOL(L)*ARAT(I+1))
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ISN 00318           AVL=AJUN(I)/DMAX1(AJUN(I),AVOL(L)*ARAT(I+1))                          XJA
ISN 00319           FJFG=DXUP(IX)
ISN 00320           GO TO 116
                C
                C       SMOOTH PIPE
ISN 00321         112 AVK=AJUN(I)/AVOL(K)
ISN 00322           AVL=AJUN(I)/AVOL(L)
                CX      FJFG=0.0
ISN 00323           FJFG=0.000                                                            XJA
                C
                C
ISN 00324         116 DXK=DXX*AVK
ISN 00325           DXL=DXL*AVL
ISN 00326           DX=DXL+DXK
                C
                C       JUNCTION WALL FRICTIONS
ISN 00327           FRICFJ=DXK*FWALF(K)+DXL*FWALF(L)
ISN 00328           FRICGJ=DXK*FWALG(K)+DXL*FWALG(L)
                C
                C  CONVECTIVE TERMS FOR LIQUID AND GAS PHASES
                C
ISN 00329           CONVF=VELF(L)**2-VELF(K)**2
ISN 00330           CONVG=VELG(L)**2-VELG(K)**2
                CX      IF(VCTRL(L).LT.0) GO TO 120
ISN 00331           IF(LLT(VCTRL(L),0BIT(0))) GO TO 120                                   XJA
                CX      L4=.NOT.MASK(48).AND.SHIFT(VCTRL(L),30)
ISN 00332           L4 = IOANDCNOT(MASK(48)),SHIFT(VCTRL(L),30))                          XJA
ISN 00333           L4=IXPC+(L4-1)*4
ISN 00334           SCRACH=AVOL(K)/AJUN(I)
                CX      CONVF=CONVF+ABS(VELF(L))*DIFVF(L4)*SCRACH
ISN 00335           CONVF=CONVF+DABS(VELF(L))*DIFVF(L4)*SCRACH                            XJA
                CX      CONVG=CONVG+ABS(VELG(L))*DIFVG(L4)*SCRACH
ISN 00336           CONVG=CONVG+DABS(VELG(L))*DIFVG(L4)*SCRACH                            XJA
                CX120 IF(VCTRL(K).LT.0) GO TO 130
ISN 00337         120 IF(LLT(VCTRL(K),0BIT(0))) GO TO 130                                 XJA
                CX      K4=.NOT.MASK(48).AND.SHIFT(VCTRL(K),30)
ISN 00338           K4 = IOANDCNOT(MASK(48)),SHIFT(VCTRL(K),30))                          XJA
ISN 00339           K4=IXPC+(K4-1)*4
ISN 00340           SCRACH=AVOL(K)/AJUN(I)
                CX      CONVF=CONVF-ABS(VELF(K))*DIFVF(K4)*SCRACH
ISN 00341           CONVF=CONVF-DABS(VELF(K))*DIFVF(K4)*SCRACH                            XJA
                CX      CONVG=CONVG-ABS(VELG(K))*DIFVG(K4)*SCRACH
ISN 00342           CONVG=CONVG-DABS(VELG(K))*DIFVG(K4)*SCRACH                            XJA
                CX130 CONVF=CONVF*0.5
ISN 00343         130 CONVF=CONVF*0.5D0                                                   XJA
                CX      CONVG=CONVG*0.5
ISN 00344           CONVG=CONVG*0.5D0                                                     XJA
                C
                C *** HEAD LOSS TERMS
                C
                C  USER INPUTTED FORM LOSSES
                CX        SCRACH  = 0.01*ATHROT(I)
ISN 00345               SCRACH  = 0.0100*ATHROT(I)                                      XJA
                CX        IF((FJUNF(I) .EQ. 0.0) .AND. (FJUNR(I) .EQ. 0.0)) GO TO 450
ISN 00346               IF((FJUNF(I) .EQ. 0.0D0) .AND. (FJUNR(I) .EQ. 0.0D0)) GO TO 450 XJA
ISN 00347           VMEAN=(AVRF*VELFJO(I)+AVRG*VELGJO(I))/AVRHO
ISN 00348             IF ( VMEAN ) 451,450,452
                C  REVERSE LOSSES

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ISN 00349         451   FLOSS    = -FJUNR(I)*(VMEAN - SCRACH)
ISN 00350               GO TO  453
ISN 00351         452   FLOSS    =  FJUNF(I)*(VMEAN + SCRACH)
ISN 00352               GO TO  453
                CX450  FLOSS = (FJUNR(I)+FJUNF(I))*0.5*SCRACH
ISN 00353         450  FLOSS = (FJUNR(I)+FJUNF(I))*0.5D0*SCRACH                          XJA
                CX453 FLOSS=FLOSS*0.5
ISN 00354         453 FLOSS=FLOSS*0.5D0                                                 XJA
                C
                C       COMPUTED FORM LOSS FACTORS
                CX    HLOSSF=FORMFJ(I)*( ABS(VELFJO(I))+SCRACH)*0.5
ISN 00355             HLOSSF=FORMFJ(I)*( DABS(VELFJO(I))+SCRACH)*0.5D0                  XJA
                CX    HLOSSG=FORMGJ(I)*( ABS(VELGJO(I))+SCRACH)*0.5
ISN 00356             HLOSSG=FORMGJ(I)*( DABS(VELGJO(I))+SCRACH)*0.5D0                  XJA
                C
                C       TIME DEPENDENT JUNCTION, BYPASS MOMENTUM EQUATIONS
                CX    IF(IJ1(I).LT.0) GO TO 810
ISN 00357             IF(LLT(IJ1(I),0BIT(0))) GO TO 810                                 XJA
                C
                C       INTERPHASE DRAG (FOR DIFFERENCE EQUATION)
                C#    FJFG=(FJFG+FIJ(I)*DX)*AVRHO/AMAX1(AVRF*AVRG,1.0E-60)
ISN 00358             FJFG=(FJFG+FIJ(I)*DX)*AVRHO/DMAX1(AVRF*AVRG,1.0D-60)              ### ???
                C
                C       FLOSS ( INPUTED FORM LOSS ) FOR DIFFERENCE EQUATION
ISN 00359             RHOFGA=RHOFA+RHOGA
ISN 00360             DIFR=(RHOGA-RHOFA)/RHOFGA
ISN 00361             SCRACH=FLOSS*DIFR
ISN 00362             FLOSSF=SCRACH*AVRF
ISN 00363             FLOSSG=SCRACH*AVRG
                C
                CX    SIGN1=SIGN(1.0,XJC(I))
ISN 00364             SIGN1=DSIGN(1.0D0,XJC(I))                                         XJA
                CX    SIGN11=SIGN(1.0,XJC(I+1))
ISN 00365             SIGN11=DSIGN(1.0D0,XJC(I+1))                                      XJA
ISN 00366             DELPZ=DI(K)*RHOO(K)*SIGN1*DZ(L)*RHOO(L)*SIGN11
ISN 00367             PSMF=(FRICFJ+HLOSSF+FLOSS)*AVRF
ISN 00368             PSMG=(FRICGJ+HLOSSG+FLOSS)*AVRG
ISN 00369             PSLD=-(AVRF*CONVF+AVRG*CONVG)-DELPZ+PH
                CY    IF(SHIFT(JC(I),5).GE.0) GO TO 625
ISN 00370             IF(LGE(SHIFT(JC(I),5),0BIT(0))) GO TO 625                         XJA
                C
                C  PSUEDO STEDY-STATE MOMENTUM TREATMENT
                C
ISN 00371             SUMF=PSMF*DT
ISN 00372             SUMG=PSMG*DT
ISN 00373             SUMOLD=(PO(K)-PO(L)+PSLD)*DT
ISN 00374             DIFF=(FRICFJ+FJFG+HLOSSF+FLOSSF)*DT
ISN 00375             DIFG=-(FRICGJ+FJFG+HLOSSG+FLOSSG)*DT
ISN 00376             DIFOLD=-(DIFR*(PO(L)-PO(K))+(CONVF-CONVG))*DT
ISN 00377               DET    = SUMF * DIFG - SUMG * DIFF
                CX      IF (DET .LT. 1.0E-10) GO TO 625
ISN 00378               IF (DET .LT. 1.0D-10) GO TO 625                                 XJA
ISN 00379               GO TO  650
                C  TWO VELOCITY TREATMENT
ISN 00380         625 VPGEN  = DOTMO(K)*DXK + DOTMO(L)*DXL
                C
                C       SUM MOMENTUM EQUATION
                C       ---------------------
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ISN 00381           SUMF=AVRF*DX+(PSMF-VPGEN)*DT
ISN 00382           SUMG=AVRG*DX+(PSMG+VPGEN)*DT
ISN 00383           SUMOLD=(AVRF*VELFJO(I)+AVRG*VELGJO(I))*DX+(PO(K)-PO(L)
                   1       +PSLO)*DT
                C
                C       VAPOR GENERATION TERM FOR DIFFERENCE EQUATION
                CX      IF ( VPGEN .LT. 0.0 )  GO TO  630
ISN 00384           IF ( VPGEN .LT. 0.000 ) GO TO  630                                          XJA
                CX    VPGNX=VPGEN/AMAX1(AVRG,1.0E-10)
ISN 00385           VPGNX=VPGEN/DMAX1(AVRG,1.00-10)                                             XJA
ISN 00386             GO TO  640
                CX630 VPGNX=-VPGEN/AMAX1(AVRF,1.0E-10)
ISN 00387         630 VPGNX=-VPGEN/DMAX1(AVRF,1.00-10)                                          XJA
                C
                C         VIRTUAL MASS INTERACTION
ISN 00388         640 VIRMAS=FAAJ(I)*AVRHO**2/RHOFGA
                C
                C         DIFFERENCE MOMENTUM EQUATION
                C         ----------------------------
                CX    SCRACH=(1.0+VIRMAS)*DX
ISN 00389           SCRACH=(1.000+VIRMAS)*DX                                                    XJA
ISN 00390           DIFF=SCRACH+(FRICFJ+FJFG+VPGNX+HLOSSF+FLOSSF)*DT
ISN 00391           DIFG=-SCRACH-(FRICGJ+FJFG+VPGNX+HLOSSG+FLOSSG)*DT
ISN 00392           DIFOLD=(VELFJO(I)-VELGJO(I))*SCRACH-(DIFR+(PO(L)-PO(K))
                   1       +(CONVF-CONVG)*VIRMAS+(VELGJO(I)+(VELF(L)*SIGNI1
                   2       -VELF(K)*SIGN(I)-VELFJO(I)+(VELG(L)*SIGNI1
                   3       -VELG(K)*SIGN(I))-DIFSTF(IX+1))*DT
                C
                C         THE FOLLOWING CALCULATION INTENDED TO PREVENT OVERFLOW
                CX    SCRACH=1.0/AMAX1(ABS(DIFG),ABS(DIFF))
ISN 00393           SCRACH=1.000/DMAX1(DABS(DIFG),DABS(DIFF))                                   XJA
ISN 00394           DIFF=DIFF*SCRACH
ISN 00395           DIFG=DIFG*SCRACH
ISN 00396           DIFOLD=DIFOLD*SCRACH
ISN 00397           DIFF=DIFR*SCRACH*DT
ISN 00398         650  CONTINUE
                C
ISN 00399            IF (HELP .EQ. 0) GO TO 197
ISN 00400           IF (HEADLN(6) .GT. 1) GO TO 198
ISN 00401           CALL HELPHD('VEXPLT',IHDFMT(1), 1)
ISN 00402           WRITE(OUTPUT, 1904)
ISN 00403         198 CONTINUE
ISN 00404        1903   FORMAT(110,1P9E13.5)
                CX      WRITE(6,1903) JUNNO(I), SUMF, SUMG, SUMOLD, DIFF, DIFG, DIFOLD,
                CX   1                      AVRG,AVRF,FJFG
ISN 00405               WRITE(6,1903) JUNNO(2,1), SUMF, SUMG, SUMOLD, DIFF, DIFG, DIFOLDXJA
                     1,                       AVRG,AVRF,FJFG                                    XJA
ISN 00406         197 CONTINUE
                C  SOLUTION OF SUM AND DIFFERENCE MOMENTUM EQUATIONS FOR
                C  VELOCITY OF LIQUID AND VELOCITY OF GAS
                CX      DET = 1.0/(SUMF*DIFG - SUMG*DIFF)
ISN 00407               DET = 1.000/(SUMF*DIFG - SUMG*DIFF)                                     XJA
ISN 00408           VELFJ(I) = (DIFG*SUMOLD - SUMG*DIFOLD)*DET
ISN 00409           VELGJ(I) =-(DIFF*SUMOLD - SUMF*DIFOLD)*DET
                C
                C  THE MOMENTUM EQUATIONS NOW LOOK LIKE;
                C  FINAL LIQUID VEL. = VELFJ(I)-VFDP(I)*((P(L)-PO(L)) - (P(K
                C  FINAL GAS    VEL. = VELGJ(I)-VGDP(I)*((P(L)-PO(L)) - (P(K


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ISN 00410           VFDP(J) = (DIFG*DT - SUMG*DIFP)*DET
ISN 00411           VGDP(J) = -(DIFF*DT - SUMF*DIFP)*DET
                C
                C  TEST FOR CHOKING
                CX      IF(IJ2(I).GE.0 .OR. VELGJ(I)+VELGJO(I).LE.0.0) GO TO 810
                CX      IF(LGE(IJ2(I),DBIT(0)).OR.VELGJ(I)+VELGJO(I).LE.0.0) GO TO 810  XJA
ISN 00412               IF(LGE(IJ2(I),DBIT(0)).OR.VELGJ(I)+VELGJO(I).LE.0.000) GO TO 810XJA
                CX    IF(VELFJO(I).LT.0.0) GO TO 514
ISN 00413           IF(VELFJO(I).LT.0.000) GO TO 514                                            XJA
                C
                C       DOWNSTREAM PRESSURE NEEDED FOR UNCHOKING
ISN 00414           PLL=PO(K)+PSLO-PSMF*VELFJO(I)-PSMG*VELGJO(I)
ISN 00415           GO TO 518
ISN 00416         514 PLL=PO(L)-PSLO+PSMF*VELFJO(I)+PSMG*VELGJO(I)
ISN 00417         518  DIFSTF(IX+1)=PLL
                C
                C                  **********************
                C       *****      END OF MOMENTUM EQUATIONS     *****
                C                  **********************
                C       DISSIPATION TERMS ( FOR ENERGY EQUATION)
                C       ----------------------------------------
                C
ISN 00418         810 AJDT=AJUN(I)*DT
                C
                C       AREA CHANGE
                CX      DISPL=0.
ISN 00419           DISPL=0.00                                                                  XJA
                CX      DISPK=0.
ISN 00420           DISPK=0.00                                                                  XJA
                CX      IF(SHIFT(JC(I),2).GE.0) GO TO 860
ISN 00421           IF(LGE(SHIFT(JC(I),2),DBIT(0))) GO TO 860                                   XJA
ISN 00422           HLSF=HLOSSF*VOIDFJ(I)*RHOFJ(I)*AJDT*(VELFJO(I))**2
ISN 00423           HLSG=HLOSSG*VOIDGJ(I)*RHOGJ(I)*AJDT*(VELGJO(I))**2
ISN 00424           IF(VELFJO(I)) 844,840,840
ISN 00425         840 DISPL=DISPL+HLSF
ISN 00426           GO TO 848
ISN 00427         844 DISPK=DISPK+HLSF
ISN 00428         848 IF(VELGJO(I)) 856,852,852
ISN 00429         852 DISPL=DISPL+HLSG
ISN 00430           GO TO 860
ISN 00431         856 DISPK=DISPK+HLSG
                C
                CX860 IF(FLOSS.LE.0.0) GO TO 872
ISN 00432         860 IF(FLOSS.LE.0.000) GO TO 872                                            XJA
ISN 00433           IF(VMEAN) 868,872,864
ISN 00434         864 DISPL=DISPL+FLOSS*AJDT*AVRHO*(VMEAN)**2
ISN 00435           GO TO 872
ISN 00436         868 DISPK=DISPK+FLOSS*AJDT*AVRHO*(VMEAN)**2
                C
                C       WALL FRICTION, INTERPHASE DRAG, AND VPOR GENERATION TERMS
ISN 00437         872 VVF=VELFJO(I)**2
ISN 00438           VVG=VELGJO(I)**2
ISN 00439           VVGF=(VELFJO(I)-VELGJO(I))**2
                C
ISN 00440           SCRACH=FIJO(I)
                C       CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
                C       FOR HOMOGENEOUS MODEL, SET FIJ=0
                CX      IF(SCRACH.GT.1.0E6)                          SCRACH=0.
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   ISN 00441          IF(SCRACH.GT.1.0D6)                                SCRACH=0.D0            XJA
                C     CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
                C
                CX    DISPK=DISPK+(FWALF(K)*AVRF*VVF+FWALG(K)*AVRG*VVG
                CX    1         + (SCRACH + 0.5 * ABS(DOTMO(K)))*VVGF)
                CX    2       *AVK*DXK*AVOL(K)*ARAT(I)*DT
   ISN 00442          DISPK=DISPK+(FWALF(K)*AVRF*VVF+FWALG(K)*AVRG*VVG                                  XJA
                     &         + (SCRACH + 0.500 * DABS(DOTMO(K)))*VVGF)                                XJA
                     &           *AVK*DXK*AVOL(K)*ARAT(I)*DT                                            XJA
                CX    DISPL=DISPL+(FWALF(L)*AVRF*VVF+FWALG(L)*AVRG*VVG
                CX    1         + (SCRACH + 0.5 * ABS(DOTMO(L)))*VVGF)
                CX    2       *AVL*DXL*AVOL(L)*ARAT(I+1)*DT
   ISN 00443          DISPL=DISPL+(FWALF(L)*AVRF*VVF+FWALG(L)*AVRG*VVG                                  XJA
                     &         + (SCRACH + 0.500 * DABS(DOTMO(L)))*VVGF)                                XJA
                     &           *AVL*DXL*AVOL(L)*ARAT(I+1)*DT                                          XJA
                C
                C       PRESSURE TERM
   ISN 00444          PVTERM=(VOIOFJ(I)*VELFJO(I)+VOIOGJ(I)*VELGJO(I))*AJDT
                CX       IF ( VCTRL(K) .LT. 0 )  GO TO  837
   ISN 00445            IF (LLT(VCTRL(K),0BIT(0)))  GO TO  837                                          XJA
                CY       KX          * .NOT. MASK(43) .AND. $HIFT(JC(I),24)
   ISN 00446            KX = IDAND(DNOT(DMASK(43)),$HIFT(JC(I),24))                                     XJA
   ISN 00447            $OURCE(KX)=  SOURCE(KX) - PO(K)*PVTERM + DISPK
                C*837    IF ( VCTRL(L) .LT. 0 )  GO TO  900
   ISN 00448      837     IF (LLT(VCTRL(L),0BIT(0)))  GO TO  900                                          XJA
                CY         LX          * .NOT. MASK(43) .AND. $HIFT(JC(I+1),24)
   ISN 00449            LX = IDAND(DNOT(DMASK(43)),$HIFT(JC(I+1),24))                                   XJA
   ISN 00450            SOURCE(LX)=  SOURCE(LX) + PO(L)*PVTERM + DISPL
   ISN 00451        900 IX=IX+3
   ISN 00452              J = J + Z
   ISN 00453            1 = 1 + IJSKP
   ISN 00454       1000 CONTINUE
                C*009   N = N + (.NOT.MASK(42) .AND. $HIFT(CMPNUM(N),30))
   ISN 00455       1009  N = N+IDAND(DNOT(DMASK(42)),$HIFT(CMPNUM(N),30))                                 XJA
   ISN 00456       1010  CONTINUE
   ISN 00457            IF (HELP .NE. 0) CALL HELPTR('VEXPLT')
   ISN 00458            RETURN
```

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SPECIFIED OPTIONS: NONAME,FLAG(1),BYNAME,GOSTMT,NOSTATIS,ISN(0),NOMAP,ELM(*)

                C
   ISN 00001          SUBROUTINE JETP(RHOSUC,PRES0,PRES1,PRES6,WD,WS,WS0,WDIS)                        JETP   2
   ISN 00002          IMPLICIT REAL*8(A-H,O-Z)
                C NAME=JETPOKA                                                                        JETP   3
                C JAERI NEW JET PUMP MODEL                                                            JETP   4
                C POSITIVE DRIVE FLOW AND SUCTION FLOW , LIQUID FLOW ONLY                             JETP   5
   ISN 00003          COMMON /JPUMP/DIA0,DIA1,DIA2,DIA3,DIA4,DIA5,DIA6,LEN0,LEN1,LEN2,                JPUMP  2
                     1LEN3,LEN4,LAMDN,LAMMZ,LAM1,LAMDIF,LAMS1,LAMS2,DUMXXX                            JPUMP  3
   ISN 00004          REAL*8 LEN0,LEN1,LEN2,LEN3,LEN4                                                 JPUMP  4
   ISN 00005          REAL*8 LAMDN,LAMMZ,LAM1,LAMDIF,LAMS1,LAMS2                                      JPUMP  5
   ISN 00006          REAL*8 LTOT,NRATIO,NRATIO                                                       JPUMP
                C                                                                                     CONTRL 2
   ISN 00007          COMMON /CONTRL/ DTHY,DTHT,DTN,DT,PRINT,TIMEHY,TIMEHT,ERRMAX,                    CONTRL 3
                     * TMASS,TMASS0,EMASS,EMASS0,AFLAG,SUCCES,DONE,NCOUNT,MSTSP,NREPET,              CONTRL 4
                     * HELP,CPUREM(2),SAFE2                                                          CONTRL 5
                C###    INTEGER PRINT,DONE,HELP,SUCCES                                               CONTRL 6
   ISN 00008            INTEGER       DONE,HELP,SUCCES                                               CONTRL
   ISN 00009            REAL*8  PRINT                                                                CONTRL
   ISN 00010            LOGICAL AFLAG,RENOD                                                          CONTRL 7
   ISN 00011            EQUIVALENCE (SAFE2,RENOD)                                                    CONTRL 8
                C  MAXIMUM ITERATION NUMBER & CONVERGENT CRITERION                                    JETP   8
                C      NMAX= MAXIMUM ITERATION NUMBER                                                 JETP   9
                C      CCRIT = CONVERGENT CRITERION                                                   JETP  10
   ISN 00012            DATA NMAX/40/,CCRIT/1.E-4/                                                   JETP  11
   ISN 00013            DATA PAI/3.14159277D0/,G/9.80700/                                            JETP  12
   ISN 00014            DATA DW,DP/ 0.002, 0.002/                                                    JETPUMP  追加
   ISN 00015            PRES10=PRES1                                                                 JETPUMP
   ISN 00016            PAI4 = PAI/4.0                                                               JETP  13
                C *** INPUT DATA ***                                                                  JETP  14
                CL DIAMETER (M)                                                                       JETP  15
                C      DIA0 = SUCTION INLET  (D0)                                                     JETP  16
                C      DIA1 = DRIVE   INLET  (D1)                                                     JETP  17
                C      DIA2 = DRIVE   OUTLET (D2)                                                     JETP  18
                C      DIA3 = SUCTION OUTLET (D3)                                                     JETP  19
                C      DIA4 = MIXING ZONE INLET  (D4)                                                 JETP  20
                C      DIA5 = MIXING ZONE OUTLET (D5)                                                 JETP  21
                C      DIA6 = DIFFUSER OUTLET    (D6)                                                 JETP  22
   ISN 00017            AREA1 = PAI4*DIA1**2                                                         JETP  23
   ISN 00018            AREA0 = PAI4*DIA0**2 - AREA1                                                 JETP  24
   ISN 00019            AREA2 = PAI4*DIA2**2    ..                                                   JETP  25
   ISN 00020            AREA3 = PAI4*DIA3**2 - AREA2                                                 JETP  26
   ISN 00021            AREA4 = PAI4*DIA4**2                                                         JETP  27
   ISN 00022            AREA5 = PAI4*DIA5**2                                                         JETP  28
   ISN 00023            AREA6 = PAI4*DIA6**2                                                         JETP  29
                CZ LENGTH (M)                                                                         JETP  30
                C      LEN0 = DRIVE & SUCTION (L0)                                                    JETP  31
                C      LEN1 = DRIVE & SUCTION (L1)                                                    JETP  32
                C      LEN2 = SUCTION (L2)                                                            JETP  33
                C      LEN3 = MIXING (L3)                                                             JETP  34
                C      LEN4 = DIFFUSER (L4)                                                           JETP  35
                C FOR 1/6 INEL DATA                                                                   JETP  36
   ISN 00024            LTOT=LEN1+LEN2+LEN3+LEN4                                                     JETP  37
                C                                                                                     JETP  38
                C3 FRICTION FACTOR                                                                    JETP  39
                C      LAMDN = WALL FRICTION AT DRIVING NOZZLE ZONE (L2)                              JETP  40
                C      LAMM2 = WALL FRICTION AT MIXING ZONE (L3)                                      JETP  41
```

DW: DP に変化量 = 初期 (%)
DW: Suction 流量
DP: Drive 側圧力

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C      LAMI  = INTERPHASE FRICTION AT SUCTION ZONE (L2)                          JETP  42
C                          ****(SUCTION FLOW - DRIVE FLOW)                       JETP  43
C      LAMD1F= WALL FRICTION AT DIFFUSER ZONE (L4)                               JETP  44
C      LAMS1 = WALL FRICTION AT SUCTION1 ZONE (L0)                               JETP  45
C      LAMS2 = WALL FRICTION AT SUCTION2 ZONE (L1)                               JETP  46
ISN 00025       ELTOT=RHOSUC*G*LTOT                                              JETP  47
ISN 00026       VEL1=WD/(RHOSUC*AREA1)                                           JETP  48
ISN 00027       EV1=VEL1**2*RHOSUC/2.0                                           JETP  49
C5 DRIVE FLOW (KG/SEC)                                                           JETP  50
C      WD = DRIVE FLOW                                                           JETP  51
C6 DENSITY (KG/M**3)                                                             JETP  52
C      RHOSUC = RHO AT SUCTION FLOW ZONE                                         JETP  53
C                                                                                JETP  54
C7     PRESSURE (PA)                                                             JETP  55
C      PRES0 = PRESSURE AT SUCTION FLOW ZONE                                     JETP  56
C      PRES6 = PRESSURE AT OUTLET OF STAGNANT                                    JETP  57
C                                                                                JETP  58
C-----------------------------------------------------------------------------JETP  59
C                                                                                JETP  60
C *** OUTPUT DATA ***                                                            JETP  61
C1     PRESSURE (PA)                                                             JETP  62
C      PRES1 = PRESSURE AT DRIVE FLOW INLET                                      JETP  63
C                                                                                JETP  64
C2     SUCTION FLOW (KG/SEC)                                                     JETP  65
C      WS = SUCTION FLOW                                                         JETP  66
C-----------------------------------------------------------------------------JETP  67
ISN 00028       IF(LEN2.EQ.0.0) D1A3=D1A4                                        JETP  68
C                                                                                JETP  69
ISN 00029       IC=1                                                             JETP  70
ISN 00030       ID=1                                                             JETP  71
C                                                                                JETP  72
ISN 00031       C0 = 1.0 + D1A3/D1A0                                             JETP  73
ISN 00032       C1 = 1.0 - D1A2/D1A1                                             JETP  74
ISN 00033       C2 = D1A6/D1A5 - 1.0                                             JETP  75
ISN 00034       C3 = ( D1A1/D1A0 )**2                                            JETP  76
ISN 00035       C5 = D1A4/D1A3 - 1.0                                             JETP  77
ISN 00036       C7 = D1A3/D1A2                                                   JETP  78
ISN 00037       C16 = LAMS2*RHOSUC/2.0                                           JETP  79
ISN 00038       VEL2 = WD/(RHOSUC*AREA2)                                         JETP  80
ISN 00039       B1 = 1.0/(1.0-C1)**4-1.0                                         JETP  81
ISN 00040       BA = RHOSUC*B1*(LAMDN*LEN1/(D1A1*C1**4.0)+1.0)/2.0               JETP  82
C                                                                                JETP  83
ISN 00041       B8 = RHOSUC*G*LEN1                                               JETP  84
ISN 00042       BC = LAMM2*LEN3/(2.0*D1A4)*RHOSUC                                JETP  85
ISN 00043       DSUC = (D1A0-D1A1-D1A2+D1A3)/4.0                                 JETP  86
ISN 00044       B0 = - RHOSUC*G*LEN3                                             JETP  87
ISN 00045       B3 = - ( 1.0 - 1.0/(1.0+C2)**4 )                                 JETP  88
ISN 00046       BE = RHOSUC*B3*(1.0-LAMD1F*LEN4/(D1A5*C2**4.0))/2.0              JETP  89
ISN 00047       BF = RHOSUC*G*LEN4                                               JETP  90
ISN 00048       BJ = RHOSUC*G*LEN2                                               JETP  91
ISN 00049       BK = 8.*RHOSUC*(AREA3/PAI)**2                                    JETP  92
ISN 00050       B1 = 1.0/( (D1A2-D1A3)*(D1A2+D1A3) )**2                          JETP  93
ISN 00051       B5 = LAMS1*(RHOSUC/2.0)*(LEN0/DSUC)*(1.0-C3)**2                  JETP  94
ISN 00052       C18 = 1.0/(RHOSUC*AREA3)                                         JETP  95
ISN 00053       C19 = C18**2                                                     JETP  96
ISN 00054       C20 = BC/(RHOSUC*AREA4)**2                                       JETP  97
ISN 00055       C21 = 1.0/(RHOSUC*AREA4**2)                                      JETP  98
ISN 00056       C22 = 1.0/(RHOSUC*AREA4)                                         JETP  99
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ISN 00057       C23 = BE/(RHOSUC*AREA4)**2                                       JETP 100
ISN 00058       C25 = 2.0*C19*WD                                                 JETP 101
ISN 00059       CA = C0**2 - C3*C1**2                                            JETP 102
ISN 00060       CB = 2.0*(C3*C1-C0)                                              JETP 103
ISN 00061       CC = 1.0 - C3                                                    JETP 104
ISN 00062       C11 = CB**2 - 4.0*CA*CC                                          JETP 105
ISN 00063       C12 = 2.0*CA + CB                                                JETP 106
ISN 00064       C13 = DSQRT(C11)                                                 JETP 107
ISN 00065       C18 =(1.0/C13)*DLOG( DABS( (C12-C13)/(C12+C13) )                 JETP 108
                1                    +DABS( (CB +C13)/(CB -C13) ) )              JETP 109
ISN 00066       C26 = 1.0/(RHOSUC*AREA6**2)/2.0                                  JETP 110
ISN 00067       C27 = 2.0*WD*C22                                                 JETP 111
ISN 00068       C29 = WD*C18                                                     JETP 112
ISN 00069       C30 = C29**2                                                     JETP 113
ISN 00070       C31 = 1.0/RHOSUC/AREA4                                           JETP 114
ISN 00071       C32 = C31**2                                                     JETP 115
ISN 00072       WD2 = WD**2                                                      JETP 116
ISN 00073       B6 = - C22/C11/(CA+CB+CC) + CB/C11/CC - 2.0*CA/C11/C12*C18       JETP 117
ISN 00074       B7 = ( (1.0-C3)/( (1.0-C0)**2-C3*(1.0-C1)**2 ) - 1.0 )**2/2.0    JETP 118
ISN 00075       BG = B5*B6 + RHOSUC*B7                                           JETP 119
ISN 00076       BH = RHOSUC*G*LEN0                                               JETP 120
ISN 00077       C17 = BG / (RHOSUC*AREA0)**2                                     JETP 121
ISN 00078       C28 = C17*WD**2                                                  JETP 122
ISN 00079       C24 = C17*WD*2.0                                                 JETP 123
ISN 00080       E13A = 16.*LEN2/D1A2**5*(AREA3/PAI)**2                           JETP 124
ISN 00081       E2A  = 32.0*LEN2/D1A2**5*(AREA2*AREA3)/PAI**2*VEL2               JETP 125
ISN 00082       E7A  = E13A*(AREA2/AREA3*VEL2)**2                                JETP 126
ISN 00083       IF(LEN2.EQ.0.0) GO TO 20                                         JETP 127
C                                                                                JETP 128
C                                                                                JETP 129
C ITERATION LOOP                                                                 JETP 130
C                                                                                JETP 131
ISN 00084       C9 = LAMI*RHOSUC/2.0                                             JETP 132
ISN 00085       NITER = 0                                                        JETP 133
ISN 00086       D1AMAX = D1A4                                                    JETP 134
ISN 00087       D1AMIN = D1A2                                                    JETP 135
ISN 00088     2 IF(NITER.GT.NMAX)GO TO 1250                                      JETP 136
ISN 00089       D1A4O = ( D1AMAX + D1AMIN ) /2.0                                 JETP 137
ISN 00090       IF((D1A4O-D1AMIN)/D1AMIN.GT.1.0E-3)GO TO 1                       JETP 138
ISN 00091       WRITE(6,630)                                                     JETP 139
ISN 00092       IF(VEL4S.GT.VEL4O)GO TO 51                                       JETP 140
ISN 00093       WS=WSO                                                           JETP 141
ISN 00094       HELP=-5                                                          JETP 142
ISN 00095       GO TO 1500                                                       JETP 143
C                                                                                JETP 144
ISN 00096     1 CONTINUE                                                         JETP 145
ISN 00097       IF((D1AMAX-D1A4O)/D1AMAX.GT.1.0E-3)GO TO 7                       JETP 146
ISN 00098     8 CONTINUE                                                         JETP 147
ISN 00099       WRITE(6,631)                                                     JETP 148
ISN 00100       WS=WSO                                                           JETP 149
ISN 00101       HELP=-5                                                          JETP 150
ISN 00102       GO TO 1500                                                       JETP 151
C                                                                                JETP 152
ISN 00103     7 NITER = NITER + 1                                                JETP 153
ISN 00104       C4 = D1A4O/D1A2                                                  JETP 154
ISN 00105       C6 = C4 - 1.0                                                    JETP 155
ISN 00106       C42= C4**2                                                       JETP 156
ISN 00107       C8 = C5/C6                                                       JETP 157
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ISN 00108           C10= C7*C8 - 1.0                                                                          JETP 158
ISN 00109           C11= C7*(1.0-C8)                                                                          JETP 159
ISN 00110           C12= C7*C8 + 1.0                                                                          JETP 160
ISN 00111           C13= C11                                                                                  JETP 161
                  C C11=C13                                                                                   JETP 162
ISN 00112           AREA4D = PAI/4.0*D(A4D**2                                                                 JETP 163
ISN 00113           AREA4S = AREA4-AREA4D                                                                     JETP 164
ISN 00114           CD = 1.0 - (C7*C8)**2                                                                     JETP 165
ISN 00115           CE = -2.0*C7**2*C8*(1.0-C8)                                                               JETP 166
ISN 00116           CF = -C7**2*(1.0-C8)**2                                                                   JETP 167
ISN 00117           CK = CD + CE + CF                                                                         JETP 168
ISN 00118           CN=1.0-1.0/C4**4                                                                          JETP 169
ISN 00119           E1 = VEL2**2/4.0*LEN2/(D(A4D-D(A2) *CN                                                    JETP 170
ISN 00120           E2 = E2A/C6                                                                               JETP 171
ISN 00121           E3 = 1.0/(2.0*CF)*(1.0-1.0/C42) + CE/CF**2*(1.0/C4-1.0)                                   JETP 172
ISN 00122           E4A= CD*C42 + CE*C4 + CF                                                                  JETP 173
ISN 00123           E4 = (CE**2-CD*CF)/(2.0*CF**3) + DLOG(C42*DABS(CK/E4A))                                   JETP 174
ISN 00124           CG = CE**2 - 4.0*CD*CF                                                                    JETP 175
                  C     CH = DSQRT(CG)                                                                        JETP 176
ISN 00125           CH = C7*(1.0-C8)**2                                                                       JETP 177
ISN 00126           E5 =-CE*(CG+CD*CF) / (2.0*CF**3*CH)                                                       JETP 178
ISN 00127           CL = 2.0*CD*C4 + CE                                                                       JETP 179
ISN 00128           CM = 2.0*CD + CE                                                                          JETP 180
ISN 00129           E6 = DLOG( DABS((CL-CH)/(CL+CH)) * DABS((CM+CH)/(CM-CH)) )                                JETP 181
ISN 00130           E7 = E13A/C6                                                                              JETP 182
ISN 00131           CI = 2.0*CD*CF - CE**2                                                                    JETP 183
ISN 00132           CJ = -CF*CG                                                                               JETP 184
ISN 00133           E8 = (CI-CD*CE*C4) / (CU*E4A)                                                             JETP 185
ISN 00134           E9 = (CJ-CD*CE) / (CJ*CK)                                                                 JETP 186
ISN 00135           E10= 1.0/(2.0*CF**2) * DLOG( C42*DABS(CK/E4A) )                                           JETP187
ISN 00136           E11 =  CE*(2.0*CD*CF-CG)/(2.0*CF**2*CG*CH)                                                JETP 188
ISN 00137           CP = RHOSUC*VEL2**2*CN/2.0                                                                JETP 189
ISN 00138           F1 = C9*E1 - BJ - CP                                                                      JETP 190
ISN 00139           F2 = C9*E2*( E3 + E4 + E5*E6 )                                                            JETP 191
ISN 00140           F3 = C9*E7*( E8 - E9 + E10 + E11*E6 )                                                     JETP 192
ISN 00141           E13 = E7                                                                                  JETP 193
                  C E7=E13                                                                                    JETP 194
ISN 00142           E14 = - ( CE*C4 + 2.0*CF )/(2.0*CG*E4A**2)                                                JETP 195
ISN 00143           E15 = ( CE + 2.0*CF )/(2.0*CG*CK**2)                                                      JETP 196
ISN 00144           E16 = 3.0*CE*(2.0*CD*C4+CE)/(2.0*CG**2*E4A)                                               JETP 197
ISN 00145           E17 = 3.0*CE*(2.0*CD*CE)/(2.0*CG**2*CK)                                                   JETP 198
ISN 00146           E18 = 3.0*CD*CE/(CG**2*CH)                                                                JETP 199
ISN 00147           C14 = (C12+C13)/(C10+C11)                                                                 JETP 200
ISN 00148           C15 = 1.0/C14                                                                             JETP 201
ISN 00149           E19 = E7                                                                                  JETP 202
                  C E7=E19                                                                                    JETP 203
ISN 00150           E20 = - 1.0/(C11*C12-C10*C13)**4                                                          JETP 204
ISN 00151           E21 = (C12*C4+C13)/(C10*C4+C11)                                                           JETP 205
ISN 00152           E22 = 1.0/E21                                                                             JETP 206
ISN 00153           E23 = C12**3*(E22-C15)                                                                    JETP 207
ISN 00154           E24 = 3.0*C12*C10**2*(E21-C14)                                                            JETP 208
ISN 00155           E25 = C10**3/2.0*(E21**2-C14**2)                                                          JETP 209
ISN 00156           E26 = 3.0*C12**2*C10*ALOG(DABS(E21*C15))                                                  JETP 210
ISN 00157           E27 = 1.0/((D(A4D+D(A4)*(D(A4D-D(A4))**2                                                  JETP 211
ISN 00158           E28 = BK*(E27-BI)                                                                         JETP 212
ISN 00159           E7A = E7A/C6                                                                              JETP 213
ISN 00160           F4 = C9*E7A*( E3 + E4 + E5*E6 ) - BJ                                                      JETP 214
ISN 00161           F5 = C9*E2*( E8 - E9 + E10 + E11*E6 )                                                     JETP 215
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ISN 00162           F6 =-C9*E13*( E14 + E15 + E16 - E17 + E18*E6 )                                            JETP 216
                  1    +C16*E19*E20*( E23 - E24 + E25 + E26 ) + E28                                          JETP 217
ISN 00163           GO TO 21                                                                                  JETP 218
                  C                                                                                         JETP 219
ISN 00164        20 F1 = 0.0                                                                                  JETP 220
ISN 00165           F2 = 0.0                                                                                  JETP 221
ISN 00166           F3 = 0.0                                                                                  JETP 222
ISN 00167           F4 = 0.0                                                                                  JETP 223
ISN 00168           F5 = 0.0                                                                                  JETP 224
ISN 00169           F6 = 0.0                                                                                  JETP 225
ISN 00170           AREA4D =AREA2                                                                             JETP 226
ISN 00171           AREA4S =AREA4-AREA2                                                                       JETP 227
                  C                                                                                         JETP 228
ISN 00172        21 HA = C17 + F6*C19 + C20 + C21 - C22/AREA4S + C23-C26                                      JETP 229
ISN 00173           HB = - C24 + F5*C18 - F6*C25 + C27/AREA4S                                                 JETP 230
ISN 00174        11 HC = PRES6 - PRES0 + C28 - BH + F4 - F5*C29 + F6*C30                                      JETP 231
                  1     + B0 - WD2*C22/AREA4S - WD2*C31/AREA4D - BF                                          JETP 232
ISN 00175           HANB = HB**2 - 4.0*HA*HC                                                                  JETP 233
ISN 00176           IF(HANB.GT.0.0D0) GO TO 12                                                                JETP 234
ISN 00177           D1AMAX =D1A4D                                                                             JETP 235
ISN 00178           IC=IC+1                                                                                   JETP 236
ISN 00179           WRITE(6,608)                                                                              JETP 237
ISN 00180         608 FORMAT( '  *** HANB.LT.0.0 ***  ' )                                                     JETP 238
                  CCC   IF(LEN2.EQ.0.0) HELP=-5                                                             JETP 239
ISN 00181           WS=WSO                                                                                    JETPUMP  追加 Wdis=Wdis+Wsuction
ISN 00182           WDIS=WD+WS                                                                                JETPUMP
ISN 00183           IF(LEN2.EQ.0.0) GO TO 1500                                                                JETP 240
ISN 00184           IF(IC.LT.NMAX)GO TO 2                                                                     JETP 241
ISN 00185           WRITE(6,627)                                                                              JETP 242
ISN 00186         627 FORMAT(/,15X,'*** IC.EQ.NMAX ***')                                                      JETP 243
ISN 00187           HELP=-5                                                                                   JETP 244
ISN 00188           GO TO 1500                                                                                JETP 245
ISN 00189        12 HD = DSQRT(HANB)                                                                          JETP 246
ISN 00190           W = ( HD-HB )/HA/2.0                                                                      JETP 247
ISN 00191           WDIS=W                                                                                    JETP 248
ISN 00192        30 WS = W - WD                                                                               JETP 249
ISN 00193           XWSA=WSO-WSO*DW                                                                           JETPUMP
ISN 00194           XWSB=WSO+WSO*DW                                                                           JETPUMP
ISN 00195           IF(WS.GE.XWSA .AND. WS.LE.XWSB) GO TO 35                                                  JETPUMP  追加 Suction 流量の変化量の制限
ISN 00196           IF(WS.LT.XWSA) WS=XWSA                                                                    JETPUMP  を行う。
ISN 00197           IF(WS.GT.XWSB) WS=XWSB                                                                    JETPUMP
ISN 00198           WDIS=WD+WS                                                                                JETPUMP
ISN 00199        35 VEL0 = WS/(RHOSUC*AREA0)                                                                  JETP 250
ISN 00200           VEL3 = WS/(RHOSUC*AREA3)                                                                  JETP 251
ISN 00201           VEL4D= WD/(RHOSUC*AREA4D)                                                                 JETP 252
ISN 00202           VEL4S= WS/(RHOSUC*AREA4S)                                                                 JETP 253
ISN 00203           VEL5=WDIS/(RHOSUC*AREA5)                                                                  JETP 254
ISN 00204           VEL6=WDIS/(RHOSUC*AREA6)                                                                  JETP 255
ISN 00205           PRES3 = PRES0 - B0*VEL0**2 + BH                                                           JETP 256
ISN 00206           PRES5 = PRES6 + B6*VEL5**2 - BF                                                           JETP 257
ISN 00207           PRES4 = PRES5 + BC*VEL5**2 + B0                                                           JETP 258
                  1      + WS/AREA4*(VEL5-VEL4S) + WD/AREA4*(VEL5-VEL4D)                                      JETP 259
ISN 00208           PRES2 = PRES4 + F1 + VEL3*F2 + VEL3**2*F3                                                 JETP 260
ISN 00209           PRES1 = PRES2 + BA*VEL1**2 - B8                                                           JETP 261
ISN 00210           XPA=PRES10-PRES10*DP                                                                      JETPUMP
ISN 00211           XPB=PRES10+PRES10*DP                                                                      JETPUMP  追加 Drive 側圧力の制限を行う。
ISN 00212           IF(PRES1.GE.XPA. AND. PRES1.LE.XPB) GO TO 38                                              JETPUMP
ISN 00213           IF(PRES1.LT.XPA) PRES1=XPA                                                                JETPUMP
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FACOM OSIV/F4 FORTRAN IV (HE)  V04L10       JETP  DATE 83.07.06  TIME 13.40.42                    PAGE  132

  ISN 00214            IF(PRES1.GT.XPB) PRES1=XPB                                             JETPUMP
  ISN 00215         38 IF(LEN2.EQ.0.0) GO TO 60
                 C
  ISN 00216            PMIN = DMIN1( DABS(PRES2),DABS(PRES3) )
  ISN 00217            IF ( PMIN.EQ.0.000) GO TO 1100
                 C
  ISN 00218            DPRES = PRES2 - PRES3
  ISN 00219            ROPRES = DPRES/PMIN
                 C
  ISN 00220            IF(DABS(ROPRES).GT.CCRIT)GO TO 4
  ISN 00221            IF(VEL4S.GT.VEL4D)GO TO 8
  ISN 00222         60 CONTINUE
  ISN 00223            DWSEC=WSO-WS
  ISN 00224            RDWSEC=DWSEC/WSO
  ISN 00225            MRATIO=WS/WD
  ISN 00226            NRATIO=(PRES6-PRES0-ELTOT)/(PRES1+EV1+ELTOT-PRES6)
  ISN 00227            EFY=MRATIO*NRATIO
  ISN 00228            GO TO 1500
  ISN 00229          4 IF(DPRES.LT.0.0)GO TO 1300
  ISN 00230            GO TO 1400
                 C
  ISN 00231       1300 CONTINUE
  ISN 00232            DIAMAX = DIA4D
  ISN 00233            GO TO 2
                 C
  ISN 00234       1400 CONTINUE
  ISN 00235            DIAMIN = DIA4D
  ISN 00236            GO TO 2
                 C
  ISN 00237       1100 CONTINUE
  ISN 00238            WRITE(6,616)
  ISN 00239        616 FORMAT(1H1,5X,'SUCTION OR DRIVING PRESSURE IS ZERO'///)
  ISN 00240            HELP=-5
  ISN 00241            GO TO 1500
                 C
  ISN 00242       1250 CONTINUE
  ISN 00243            WRITE(6,618)
  ISN 00244        618 FORMAT(1H1,5X,'ITERATION NUMBER WAS OVER NMAX'///)
                 C
  ISN 00245            HELP=-5
  ISN 00246            GO TO 1500
                 C
  ISN 00247         51 CONTINUE
  ISN 00248            WRITE(6,632)
  ISN 00249            WS=WSO
  ISN 00250            HELP=-5
  ISN 00251        630 FORMAT('   *** LAMI IS TOO SMALL ***'/)
  ISN 00252        631 FORMAT('   *** LAMI IS TOO LARGE ***'/)
  ISN 00253        632 FORMAT(/,'  *** NO SOLUTION IS OBTAINED. BECAUSE P2.LT.P3. AND
                      1VEL4D.LT.VEL4S. AT DIA4D IS MINIMUM    ***')
  ISN 00254       1500 CONTINUE
                 C****************( D E B U G   W R I T E )**********************************
                 C     1WRITE(6,9019) NCOUNT,TIMEMY,RHOSUC,WD,PRES0,PRES6,WSO,PRES10
                 C     1              ,WS,WDIS,PRES1,MRATIO,NRATIO,EFY
                 C9019 FORMAT(1H ,'*(JETP)=  NCOUNT,TIMEMY/RHOSUC,WD,PRES0,PRES6,WSO,'
                 C     1       ,'PRES10,WS,WDIS,PRES1,MRATIO,NRATIO,EFY',I6,1PE12.4/
                 C     2       (1H ,1P12E11.4))
                 C*************************************************************************


FACOM OSIV/F4 FORTRAN IV (HE)  V04L10       JETP  DATE 83.07.06  TIME 13.40.42                    PAGE  133

  ISN 00255            IF(HELP.EQ.-5) WRITE(6,634) TIMEMY,NCOUNT,WD,WSO,PRES0,PRES6
  ISN 00256     634    FORMAT('0**ERROR**ERROR**ERROR**ERROR**ERROR***',/1X,
                     X'      SUBROUTINE JETP FAILED AT TIME',E16.6,' STEP NUMBER ',I10
                     X,/1X,'  DRIVE FLOW =           ',1PE20.10
                     X,/1X,'SUCTION FLOW =           ',1PE20.10
                     X,/1X,'SUCTION PRESSURE =       ',1PE20.10
                     X,/1X,'DISCHARGE PRESSURE =     ',1PE20.10 )
  ISN 00257            RETURN
```

付録2C－1　インプットデータリスト（RUN926, JAERI Jet Pump Model）

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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8

NO.1    MODULE NAME R926JP3T            BLOCKS    55

                    LEVEL     6         DATE      84.05.09  TIME      18.58.30

               ***** APPOINTED MODULE INFORMATION *****

                    LEVEL     6         DATE      84.07.31  TIME      15.45.12


=ROSA-III RUN926 POST-TEST ANALYSIS BY RELAP5/MOD1                          *00000100
*************************************************************************** *00000200
*                                                                           *00000300
* RRRRRRRRR   OOOOOOOOO   SSSSSSSSS     AAAA         IIIIIIIIIIIIIIII *00000400
* RRRRRRRRR   OOOOOOOOO   SSSSSSSSS     AAAA         IIIIIIIIIIIIIIII *00000500
* RR      RR  OO     OO  SS           AA  AA           II  II  II     *00000600
* RR      RR  OO     OO  SSS         AA    AA          II  II  II     *00000700
* RRRRRRRRR   OO     OO   SSSSSSS    AA    AA          II  II  II     *00000800
* RRRRRRRRR   OO     OO    SSSSSSS   AA    AA    ===   II  II  II     *00000900
* RR   RR     OO     OO          SS  AAAAAAAAAA  ===   II  II  II     *00001000
* RR    RR    OO     OO          SS  AAAAAAAAAA        II  II  II     *00001100
* RR     RR   OO     OO          SS  AA      AA        II  II  II     *00001200
* RR      RR  OO     OO    SSSSSSSS  AA      AA        II  II  II     *00001300
* RR       RR  OOOOOOOOO  SSSSSSSSS  AA      AA  IIIIIIIIIIIIIIII *00001400
* RR       RR  OOOOOOOOO  SSSSSSSSS  AA      AA  IIIIIIIIIIIIIIII *00001500
*                                                                           *00001600
*************************************************************************** *00001700
*                                                                           *00001800
*   BASE INPUT DATA              CREATED 1982/03/01                         *00001900
*           BASE INPUT J0797.R910PD02.DATA(RLPSMOA2)                        *00002000
*           BASE INPUT J9268.R5M1PA01.DATA(R5M1CA21)                        *00002100
*                        CREATED 1983/09/21                                 *00002200
*           BASE INPUT J2035.ROSAJP2.DATA(R901JP4T)                         *00002300
*           BASE INPUT J2035.ROSAJP2.DATA(R926JP1T)                         *00002310
*                                                                           *00002400
*RELAP5/MOD1 INPUT DATA                                                     *00002500
*                                                                           *00002600
*           TYPE         OPTION                                            *00002700
0000100     NEW          TRANSNT                                           *00002800
*                                                                           *00002900
*                INPUT CHECK                                                *00003000
0000101          RUN                                                       *00003100
*                                                                           *00003200
*            INPUT       OUTPUT                                           *00003300
0000102     SI          SI                                                 *00003400
*                                                                           *00003500
*          T END    MIN      MAX     CON   MIE  MAE   MR                   *00003600
0000201    1000.0   1.0-12   0.005     2    20  2000  2000                *00003700
*                                                                           *00003800
*                                                                           *00003900
0000502     TIME     0       GE     NULL    0   0.01          L   *BREAK *00004000
0000509     TIME     0       GE     NULL    0   0.01          L   *MRP1  *00004100
0000510     TIME     0       GE     NULL    0   0.01          L   *MRP2  *00004200
0000513     TIME     0       LT     NULL    0   0.01          N   *QSV   *00004300
0000527     TIME     0       GE     NULL    0   1000.0        L  *BREAK P*00004400
0000530  TIME 0 GE NULL 0 200.0 L * END PROBLEM                            *00004500
0000600  530                                                               *00004600
*                                                                           *00004700

                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*************************************************************************** *00004800
*************************************************************************** *00004900
*                                                                           *00005000
**********          HYDRODYNAMIC COMPONENTS          ********************** *00005100
*                                                                           *00005200
*     REFERENCES                                                            *00005300
*       1. JAERI-M 8588   RELAP4J INPUT DATA FOR ROSA-III RUN 704           *00005400
*       2. JAERI-M 8499   PIPING ETC                                        *00005500
*       3. MECHANICAL ENGINEERING HANDBOOK                                  *00005600
*       4. RELAP5 USERS MANUAL VOL 1,2,3                                    *00005700
*       5. LOFT INPUT DATA FOR RELAP5 CALCULATION                           *00005800
*                                                                           *00005900
*     FUNDAMENTAL ASSUMPTION                                                *00006000
*          NONHOMOGENEOUS, NONEQUILIBRIUM ..... INSIDE VESSEL               *00006100
*                                                                           *00006200
*     NOTE                                                                  *00006300
*       ALL BEND RESISTANCES ARE CALCULATED FROM REFERENCE 3                *00006400
*       ALL WALL ROUGHNESS ARE CONSTANT                                     *00006500
*           E = 0.00005  (M)                                               **00006600
*                                                                           *00006700
*************************************************************************** *00006800
*                                                                           *00006900
*  LOWER PLENUM (1)                                                         *00007000
*                                                                           *00007100
*           NAME         TYPE                                              *00007200
0100000     C010         BRANCH                                            *00007300
*                                                                           *00007400
*           NO JUN       INITIAL C.C                                       *00007500
0100001      5            1                                                *00007600
*                                                                           *00007700
*         AREA  LEN    VOL       HZ   VR    ELV    ROUG     HYD  FE       *00007800
0100101   0.0   0.120  0.07959   0.0  90.0  0.120  0.00005  0.0  00       *00007900
*                                                                           *00008000
*          CTL    PRESSURE     TEMP     ZERO                              *00008100
0100200     3     7.35140+6    551.92   0.0                               *00008200
*                                                                           *00008300
*            FR         TD       AREA     F-LOSS R-LOSS CAHS             *00008400
0101101   010000000 011010000  0.0      0.0    0.0    0100               *00008500
0102101   185010000 010000000  0.0      1.0    0.432  0000               *00008600
0103101   245010000 010000000  0.0      1.0    0.432  0000               *00008700
0104101   010010000 020000000  0.0      0.0    0.0    0100               *00008800
0105101   010010000 090000000  1.758-4  1.55   1.55   0000               *00008900
*                                                                           *00009000
*          FLOW-F  FLOW-G   VELJ                                            *00009100
0101201   7.5391-4  0.0      0.0                                           *00009200
0102201    8.11     0.0      0.0                                           *00009300
0103201    8.11     0.0      0.0                                           *00009400
0104201   15.533    0.0      0.0                                           *00009500
0105201    0.71552  0.0      0.0                                           *00009600
*                                                                           *00009700
*************************************************************************** *00009800
*                                                                           *00009900
0110000     C011         SNGLVOL                                           *00010000
0110101   0.3374  0.1350 0.0  0.0  90.0  0.1350 0.00005  0.0951  00       *00010100
*                                                                           *00010200
0110200     3     7.35230+6    551.61   0.0                               *00010300
*                                                                           *00010400
*************************************************************************** *00010500
*                                                                           *00010600
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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*  LOWER PLENUM (2)                                                          *00010700
*                                                                            *00010800
*          NAME         TYPE                                                 *00010900
0200000    C020         PIPE                                                 *00011000
0200001    2                                                                 *00011100
0200101   0.07849      2                                                     *00011200
0200201   0.04366      1                                                     *00011300
0200301   0.2550       1                                                     *00011400
0200302   0.7819       2                                                     *00011500
0200401   0.0          2                                                     *00011600
0200501   0.0          2                                                     *00011700
0200601   90.0         2                                                     *00011800
0200701   0.2550       1                                                     *00011900
0200702   0.7819       2                                                     *00012000
0200801   0.00005    0.03714   2                                            *00012100
0200901   0.0      0.0       1                                              *00012200
0201001   00         2                                                       *00012300
0201101   0100       1                                                       *00012400
0201201   3      7.34980+6   551.85  0.0 0.0 1                              *00012500
0201202   3      7.34580+6   551.73  0.0 0.0 2                              *00012600
0201300   1                                                                 *00012700
0201301   15.536   0.0    0.0    1                                          *00012800
*                                                                           *00012900
*************************************************************************** *00013000
*                                                                           *00013100
*  CORE INLET CHAMBER                    (VOLUME 3 .... RELAP4J)            *00013200
*                                                                           *00013300
*          NAME         TYPE                                                *00013400
0300000    C030         BRANCH                                              *00013500
*                                                                           *00013600
*          ND JUN       INITIAL C.C                                         *00013700
0300001     3            1                                                  *00013800
*                                                                           *00013900
*         AREA   LEN   VOL    HZ   VR    ELV    ROUG      HYD       FE     *00014000
0300101  2.9355-2 0.3350  0.0  0.0  90.0  0.2300  0.00005  9.795-3 00       *00014100
*                                                                           *00014200
*          CTL   PRESSURE    TEMP    ZERO                                   *00014300
0300200    3     7.32760+6    551.70   0.0                                  *00014400
*                                                                           *00014500
*           FR         TO        AREA   F-LOSS R-LOSS CAHS                 *00014600
0301101  020010000 030000000  0.003352  10.94  10.94   0000                *00014700
0302101  030010000 040000000  0.009498   0.0    0.0    0100                *00014800
0303101  030010000 100000000  0.0003937  1.76   1.76   0000                *00014900
*                                                                           *00015000
*          FLOW-F  FLOW-G   VELJ                                            *00015100
0301201   11.829   0.0      0.0                                            *00015200
0302201   11.348   0.0      0.0                                            *00015300
0303201    0.48079 0.0      0.0                                            *00015400
*                                                                           *00015500
0310000    C031    BRANCH                                                  *00015600
0310001    3       1                                                       *00015700
0310101   0.009785  0.335  0.0  0.0  90.0  0.23  0.00005  3.265-3  00     *00015800
0310200    3      7.32910+6      551.70     0.0                            *00015900
0311101  020010000 031000000  0.001784 10.94 10.94  0000                  *00016000
0312101  031010000 045000000  0.003166  0.0   0.0   0100                  *00016100
0313101  031010000 100000000  1.312-4   1.76  1.76  0000                  *00016200
0311201   3.7117  0.0  0.0                                                 *00016300
0312201   3.5124  0.0  0.0                                                 *00016400
0313201   0.19948 0.0  0.0                                                 *00016500

                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*************************************************************************** *00016600
*                                                                           *00016700
*  CORE                                  (VOLUME 32-37,4 .. RELAP4J)        *00016800
*      **** AVERAGE POWER CHANNEL                                           *00016900
*                                                                           *00017000
*          NAME         TYPE                                                *00017100
0400000    C040         PIPE                                                *00017200
*                                                                           *00017300
*          NO.VOL                                                          *00017400
0400001     7                                                              *00017500
*                                                                           *00017600
*         AREA        VOL NO                                               *00017700
0400101  0.02936        7                                                  *00017800
*                                                                           *00017900
*         AREA        JUN NO                                               *00018000
0400201  0.0            6                                                  *00018100
*                                                                           *00018200
*         LEN         VOL NO                                               *00018300
0400301  0.308          1                                                  *00018400
0400302  0.235          3                                                  *00018500
0400303  0.470          4                                                  *00018600
0400304  0.235          6                                                  *00018700
0400305  0.308          7                                                  *00018800
*                                                                           *00018900
*         VOL         VOL NO                                               *00019000
0400401  0.0            7                                                  *00019100
*                                                                           *00019200
*         HZ          VOL NO                                               *00019300
0400501  0.0            7                                                  *00019400
*                                                                           *00019500
*         VR          VOL NO                                               *00019600
0400601  90.0           7                                                  *00019700
*                                                                           *00019800
*         ELV         VOL NO                                               *00019900
0400701  0.308          1                                                  *00020000
0400702  0.235          3                                                  *00020100
0400703  0.470          4                                                  *00020200
0400704  0.235          6                                                  *00020300
0400705  0.308          7                                                  *00020400
*                                                                           *00020500
*         ROUGH        HYD   VOL NO                                        *00020600
0400801  0.00005    0.01306   7                                           *00020700
*                                                                           *00020800
*         F-LOSS   R-LOSS   JUN NO                                         *00020900
0400901   1.361    1.361      6                                           *00021000
*                                                                           *00021100
*         FE          VOL NO                                               *00021200
0401001  00             7                                                  *00021300
*                                                                           *00021400
*         CAHS        JUN NO                                               *00021500
0401101  0000           6                                                  *00021600
*                                                                           *00021700
*         CTL    PRESSURE      TEMP      ZERO       VOL                    *00021800
0401201    3     7.32390+6    554.44    0.0  0.0   1                      *00021900
0401202    3     7.32170+6    559.59    0.0  0.0   2                      *00022000
0401203    2     7.32000+6    9.9999-3  0.0  0.0   3                      *00022100
0401204    2     7.31790+6    0.033318  0.0  0.0   4                      *00022200
0401205    2     7.31580+6    0.048334  0.0  0.0   5                      *00022300
0401206    2     7.31430+6    0.046690  0.0  0.0   6                      *00022400
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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
0401207     2     7.3128D+6     0.063819  0.0  0.0  7                          *00022500
          CTL                                                                  *00022600
0401300     1                                                                  *00022700
*                                                                              *00022800
*          FLOW-F  FLOW-G   VELJ    JUN NO                                     *00022900
0401301     11.349   0.0      0.0      1                                       *00023000
0401302     11.349   0.0      0.0      2                                       *00023100
0401303     11.1743  0.1787   0.0      3                                       *00023200
0401304     10.5235  0.8305   0.0      4                                       *00023300
0401305     10.2405  1.1139   0.0      5                                       *00023400
0401306     10.0308  1.3238   0.0      6                                       *00023500
*                                                                              *00023600
********************************************************************************00023700
*                                                                              *00023800
*  CORE                                                                        *00023900
*      **** HIGH POWER CHANNEL                                                 *00024000
*                                                                              *00024100
0450000     C045       PIPE                                                    *00024200
0450001     7                                                                  *00024300
0450101     0.009785      7                                                    *00024400
0450201     0.0           6                                                    *00024500
0450301     0.308         1                                                    *00024600
0450302     0.235         3                                                    *00024700
0450303     0.470         4                                                    *00024800
0450304     0.235         6                                 *                  *00024900
0450305     0.308         7                                 *                  *00025000
0450401     0.0           7                                                    *00025100
0450501     0.0           7                                                    *00025200
0450601     90.0          7                                                    *00025300
0450701     0.308         1                                                    *00025400
0450702     0.235         3                                                    *00025500
0450703     0.470         4                                                    *00025600
0450704     0.235         6                                 *                  *00025700
0450705     0.308         7                                 *                  *00025800
0450801     0.00005   0.01306  7                                               *00025900
0450901     1.361  1.361  6                                                    *00026000
0451001     00            7                                                    *00026100
0451101     0000          6                                                    *00026200
0451201     3     7.32550+6     555.84     0.0  0.0  1                        *00026300
0451202     3     7.32330+6     562.01     0.0  0.0  2                        *00026400
0451203     2     7.32170+6     0.018923   0.0  0.0  3                        *00026500
0451204     2     7.32000+6     0.079437   0.0  0.0  4                        *00026600
0451205     2     7.31790+6     0.046495   0.0  0.0  5                        *00026700
0451206     2     7.31670+6     0.12919    0.0  0.0  6                        *00026800
0451207     2     7.31530+6     0.15183    0.0  0.0  7                        *00026900
0451300     1                                                                  *00027000
0451301     3.5126  0.0     0.0     1                                          *00027100
0451302     3.5127  0.0     0.0     2                                          *00027200
0451303     3.3635  0.1495  0.0     3                                          *00027300
0451304     3.0592  0.4541  0.0     4                                          *00027400
0451305     2.9277  0.5857  0.0     5                                          *00027500
0451306     2.8298  0.6837  0.0     6                                          *00027600
*                                                                              *00027700
********************************************************************************00027800
*                                                                              *00027900
*  UPPER PLENUM                          (VOLUME 5 .... RELAP4J)               *00028000
*                                                                              *00028100
*          NAME        TYPE                                                    *00028200
0500000     C050        BRANCH                                                  *00028300

                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*                                                                              *00028400
*          NO JUN      INITIAL C.C                                             *00028500
0500001     4           1                                                      *00028600
*                                                                              *00028700
*         AREA  LEN   VOL   HZ   VR    ELV   ROUG    HYD   FE                 *00028800
0500101   0.0  0.234 0.04137 0.0  90.0  0.234  0.00005  0.5  00               *00028900
*                                                                              *00029000
*         CTL   PRESSURE   QUALITY   ZERO                                      *00029100
0500200   2    7.30880+6   0.040595  0.0                                       *00029200
*                                                                              *00029300
*           FR         TO       AREA     F-LOSS R-LOSS  CAHS                  *00029400
0501101   045010000 050000000  0.003164     1.298  1.216  0000               *00029500
0502101   040010000 050000000  0.009492     1.298  1.216  0000               *00029600
0503101   100010000 050000000  0.01447      1.0    0.41   0000               *00029700
0504101   050010000 051000000  0.0          0.0    0.0    0000               *00029800
*                                                                              *00029900
*         FLOW-F   FLOW-G  VELJ                                                *00030000
0501201   2.7776   0.7361   0.0                                                *00030100
0502201   9.9164   1.4366   0.0                                                *00030200
0503201   1.3960   0.0      0.0                                                *00030300
0504201  14.1429   2.1221   0.0                                                *00030400
*                                                                              *00030500
0510000     C051       PIPE                                  *                 *00030600
0510001     2                                                *                 *00030700
0510101     0.0  2                                           *                 *00030800
0510201     0.0  1                                           *                 *00030900
0510301     0.2345  2                                        *                 *00031000
0510401     0.041365  2                                      *                 *00031100
0510501     0.0  2                                           *                 *00031200
0510601     90.0  2                                          *                 *00031300
0510701     0.2345  2                                        *                 *00031400
0510801     0.00005  0.5  2                                  *                 *00031500
0510901     0.0  0.0  1                                      *                 *00031600
0511001     00  2                                            *                 *00031700
0511101     0000  1                                          *                 *00031800
0511201     2  7.30770+6  0.024655 0.0 0.0  1                *                 *00031900
0511202     2  7.3066D+6  0.032057 0.0 0.0  2                *                 *00032000
0511300     1                                                *                 *00032100
0511301     14.1432  2.1218  0.0  1                         *                 *00032200
*                                                            *                 *00032300
0520000     C052  SNGLJUN                                    *                 *00032400
0520101     051010000 060000000  0.02165  0.407  0.792  0000*                 *00032500
0520201     1  14.1343  2.1217  0.0                         *                 *00032600
********************************************************************************00032700
*                                                                              *00032800
*  STEAM SEPARATOR                                                             *00032900
0600000     C060   PIPE                                     *                 *00033000
0600001     4                                                *                 *00033100
0600101     0.0  1                                           *                 *00033200
0600102     0.04101  3                                       *                 *00033300
0600103     0.0  4                                           *                 *00033400
0600201     0.01387   1                                      *                 *00033500
0600202     0.0       2                                      *                 *00033600
0600203     0.017789  3                                      *                 *00033700
0600301     0.335  1                                        *                 *00033800
0600302     0.2497  3                                       *                 *00033900
0600303     0.288  4                                        *                 *00034000
0600401     0.006416  1                                     *                 *00034100
0600402     0.0  3                                          *                 *00034200
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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
0600403     0.005564  4                                *                  *00034300
0600501     0.0  4                                     *                  *00034400
0600601     90.0  4                                    *                  *00034500
0600701     0.335  1                                   *                  *00034600
0600702     0.2497  3                                  *                  *00034700
0600703     0.288  4                                   *                  *00034800
0600801     0.00005  0.15616  1                        *                  *00034900
0600802     0.00005  0.22312  3                        *                  *00035000
0600803     0.00005  0.1585   4                        *                  *00035100
0600901     0.0  0.0  3                                *                  *00035200
0601001     00  4                                      *                  *00035300
0601101     0100  3                                    *                  *00035400
0601201     2  7.30430+6  0.075649 0.0 0.0  1          *                  *00035500
0601202     2  7.30380+6  0.022138 0.0 0.0  2          *                  *00035600
0601203     2  7.30290+6  0.11744  0.0 0.0  3          *                  *00035700
0601204     2  7.30000+6  0.037099 0.0 0.0  4          *                  *00035800
0601300     1                                          *                  *00035900
0601301     14.1375  2.1225  0.0  1                    *                  *00036000
0601302     14.1342  2.1278  0.0  2                    *                  *00036100
0601303     14.1276  2.1234  0.0  3                    *                  *00036200
*                                                                         *00036300
**************************************************************************00036400
*                                                                         *00036500
*  UPPER DOWNCOMER                                                        *00036600
*                                                                         *00036700
*          NAME         TYPE                                             *00036800
0710000     C071         BRANCH                                           *00036900
0710001   3  1                                                            *00037000
0710101   0.0   0.5503  0.1891  0.0  90.0  0.5503  0.00005  0.6615 00    *00037100
0710200   2  7.29770+6  0.15944  0.0                                      *00037200
0711101   060010000  071010000  0.0        0.0  0.0  0000               *00037300
0712101   071010000  070000000  0.0        0.0  0.0  0000               *00037400
0713101   071000000  110010000  0.2316     0.0  0.0  0100               *00037500
0711201   14.1360  2.1240   0.0                                          *00037600
0712201   0.0      2.1198   0.0                                          *00037700
0713201   13.8895   0.01351 0.0                                          *00037800
*                                                                         *00037900
**************************************************************************00038000
*                                                                         *00038100
*  UPPER HEAD (ABOVE SEPARATOR)                                           *00038200
*                                                                         *00038300
0700000   C070          SNGLVOL                                          *00038400
0700101   0.38485  0.2817  0.0  0.0  90.0  0.2817  0.00005  0.7     00   *00038500
0700200   2      7.29780+6  0.99973  0.0                                 *00038600
*                                                                         *00038700
**************************************************************************00038800
*                                                                         *00038900
0720000     C072         SNGLJUN                                          *00039000
0720101     070010000  080000000  0.01914  0.0  0.0  0100               *00039100
0720201     1  0.0  2.1186  0.0                                          *00039200
*                                                                         *00039300
**************************************************************************00039400
*                                                                         *00039500
*  STEAM DOME                              (VOLUME 8 .... RELAP4J)        *00039600
*                                                                         *00039700
*          NAME         TYPE                                             *00039800
0800000     C080         SNGLVOL                                          *00039900
*                                                                         *00040000
*         AREA  LEN      VOL        HZ   VR    ELV     ROUG     HYD  FE  *00040100
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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
0800101    0.0   0.348   0.126748  0.0  90.0  0.348  0.00005  0.7  00   *00040200
*                                                                         *00040300
*          CTL   PRESSURE    QUALITY    ZERO                             *00040400
0800200     2    7.29730+6   0.99317    0.0                              *00040500
*                                                                         *00040600
**************************************************************************00040700
*                                                                         *00040800
*  GUIDE TUBE                              (VOLUME 9 .... RELAP4J)        *00040900
*                                                                         *00041000
*          NAME         TYPE                                             *00041100
0900000     C090         PIPE                                             *00041200
0900001     3                                                             *00041300
0900101   0.0      2                                                      *00041400
0900102   0.02515  3                                                      *00041500
0900201   0.0      1                                                      *00041600
0900202   0.00193  2                                                      *00041700
0900301   0.5529   1                                                      *00041800
0900302   0.554    2                                                      *00041900
0900303   0.16  3                                                        *00042000
0900401   0.036298  1                                                    *00042100
0900402   0.028296  2                                                    *00042200
0900403   0.0  3                                                         *00042300
0900501   0.0        3                                                   *00042400
0900601   90.0       3                                                   *00042500
0900701   0.5529     1                                                   *00042600
0900702   0.554      2                                                   *00042700
0900703   0.16  3                                                        *00042800
0900801   0.00005 0.05567   2                                           *00042900
0900802   0.00005 0.02284   3                                           *00043000
0900901   0.0      0.0       2                                          *00043100
0901001   00         3                                                  *00043200
0901101   0000       1                                                  *00043300
0901102   0100       2                                                  *00043400
0901201   3      7.33180+6   551.70   0.0  0.0  1                       *00043500
0901202   3      7.32770+6   551.69   0.0  0.0  2                       *00043600
0901203   3      7.32490+6   551.69   0.0  0.0  3                       *00043700
0901300   1                                                             *00043800
0901301   0.71587 0.0       0.0       1                                 *00043900
0901302   0.71584 0.0       0.0       2                                 *00044000
*                                                                         *00044100
**************************************************************************00044200
*                                                                         *00044300
0950000     C095    SNGLJUN                                             *00044400
0950101     090010000 100000000  0.00193  0.0    0.0    0100           *00044500
0950201     1      0.71583 0.0    0.0                                   *00044600
*                                                                         *00044700
**************************************************************************00044800
*                                                                         *00044900
*  CORE BYPASS                             (VOLUME10 .... RELAP4J)        *00045000
*                                                                         *00045100
*          NAME         TYPE                                             *00045200
1000000     C100         PIPE                                             *00045300
1000001   3                                                               *00045400
1000101   0.02515    3                                                    *00045500
1000201   0.0        2                                                    *00045600
1000301   0.676      1                                                    *00045700
1000302   0.675      2                                                    *00045800
1000303   0.675      3                                                    *00045900
1000401   0.0        3                                                    *00046000
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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
1000501    0.0         3                                                      *00046100
1000601    90.0        3                                                      *00046200
1000701    0.676       1                                                      *00046300
1000702    0.675       2                                                      *00046400
1000703    0.675       3                                                      *00046500
1000801    0.00005 0.022284   3                                               *00046600
1000901    0.0      0.0       2                                               *00046700
1001001    00          3                                                      *00046800
1001101    0000        2                                                      *00046900
1001201    3      7.32180+6    551.69    0.0  0.0  1                         *00047000
1001202    3      7.31680+6    551.69    0.0  0.0  2                         *00047100
1001203    3      7.31180+6    551.69    0.0  0.0  3                         *00047200
1001300    1                                                                 *00047300
1001301    1.3961   0.0      0.0      2                                       *00047400
*                                                                            *00047500
*****************************************************************************00047600
*                                                                            *00047700
*  UPPER DOWNCOMER-1                        (VOLUME27 .... RELAP4J)          *00047800
*                                                                            *00047900
*           NAME          TYPE                                               *00048000
1100000     C110          SNGLVOL                                            *00048100
1100101   0.0  0.2371  0.05588  0.0  90.0  0.2371  0.00005  0.5478  00       *00048200
1100200   2   7.29860+6    0.27676 0.0                                       *00048300
*****************************************************************************00048400
*                                                                            *00048500
*  UPPER DOWNCOMER        (FEEDWATER SPAGER)                                 *00048600
*                                                                            *00048700
*           NAME          TYPE                                               *00048800
1110000     C111          BRANCH                                             *00048900
*                                                                            *00049000
1110001   2        1                                                         *00049100
1110101   0.0  0.328  0.081672  0.0  90.0  0.328  0.00005  0.56306  00      *00049200
1110200   3     7.29980+6  552.98  0.0                                       *00049300
1111101   110000000 111010000  0.0      0.0    0.0    0000                  *00049400
1112101   111000000 112010000  0.08006  0.0    0.0    0000                  *00049500
1111201     14.113  0.0      0.0                                             *00049600
1112201     16.228  0.0      0.0                                             *00049700
*****************************************************************************00049800
*                                                                            *00049900
1120000     C112          PIPE                                               *00050000
1120001     3                                                                *00050100
1120101     0.0           1                                                  *00050200
1120102     0.08006       2                                                  *00050300
1120103     0.08006       3                                                  *00050400
1120201     0.0           2                                                  *00050500
1120301     0.189         1                                                  *00050600
1120302     0.356         2                                                  *00050700
1120303     0.35          3                                                  *00050800
1120401     0.013658      1                                                  *00050900
1120402     0.0           3                                                  *00051000
1120501     0.0           3                                                  *00051100
1120601     90.0          3                                                  *00051200
1120701     0.189         1                                                  *00051300
1120702     0.356         2                                                  *00051400
1120703     0.35          3                                                  *00051500
1120801     0.00005 0.303     1                                              *00051600
1120802     0.00005 0.092     3                                              *00051700
1120901     0.0     0.0       2                                              *00051800
1121001     00            3                                                  *00051900

                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
1121101     0000          2                                                  *00052000
1121201     3      7.30730+6    552.80    0.0  0.0  1                         *00052100
1121202     3      7.30530+6    552.85    0.0  0.0  2                         *00052200
1121203     3      7.30270+6    552.92    0.0  0.0  3                         *00052300
1121300     1                                                                 *00052400
1121301   -16.232   0.0      0.0      1                                       *00052500
1121302   -16.230   0.0      0.0      2                                       *00052600
*****************************************************************************00052700
*                                                                            *00052800
*  LOWER DOWNCOMER (JET PUMP INLET)     (VOLUME11 .... RELAP4J)              *00052900
*                                                                            *00053000
*           NAME          TYPE                                               *00053100
1200000     C120          BRANCH                                             *00053200
*                                                                            *00053300
*           NO JUN        INITIAL C.C                                        *00053400
1200001     4             1                                                  *00053500
*                                                                            *00053600
*          AREA      LEN    VOL  HZ   VR    ELV    ROUG      HYD     FE     *00053700
1200101   0.022478  0.541  0.0  0.0  90.0  0.541  0.00005   0.030   00      *00053800
*                                                                            *00053900
*          CTL   PRESSURE     TEMP      ZERO                                 *00054000
1200200   3     7.30950+6    552.78    0.0                                  *00054100
*                                                                            *00054200
*            FR          TO        AREA   F-LOSS R-LOSS CAHS                *00054300
1201101   112000000 120010000  0.0      0.0     0.0     0100                *00054400
1202101   120000000 130010000  0.0      0.0     0.0     0000                *00054500
1203101   120000000 170000000  0.0      0.55    1.0     0000                *00054600
1204101   120000000 230000000  0.0      0.55    1.0     0000                *00054700
*                                                                            *00054800
*          FLOW-F    FLOW-G  VELJ                                           *00054900
1201201   16.233     0.0     0.0                                            *00055000
1202201    6.34      0.0     0.0                                            *00055100
1203201    4.94      0.0     0.0                                            *00055200
1204201    4.94    0.0       0.0                                            *00055300
*                                                                            *00055400
*****************************************************************************00055500
*                                                                            *00055600
*  LOWER DOWNCOMER                      (VOLUME11 .... RELAP4J)              *00055700
*                                                                            *00055800
*           NAME          TYPE                                               *00055900
1300000     C130          PIPE                                               *00056000
1300001   4                                                                  *00056100
1300101   0.0           1                                                    *00056200
1300102   0.022478      4                                                    *00056300
1300201   0.0           3                                                    *00056400
1300301   0.365         4                                                    *00056500
1300401   0.014181      1                                                    *00056600
1300402   0.0           4                                                    *00056700
1300501   0.0           4                                                    *00056800
1300601   90.0          4                                                    *00056900
1300701   0.365         4                                                    *00057000
1300801   0.00005  0.070333 1                                               *00057100
1300802   0.00005  0.030    4                                               *00057200
1300901   0.0      0.0      3                                               *00057300
1301001   00           4                                                    *00057400
1301101   0000       3                                                      *00057500
1301201   3      7.32120+6    552.03    0.0  0.0  1                         *00057600
1301202   3      7.31840+6    552.28    0.0  0.0  2                         *00057700
1301203   3      7.31580+6    552.44    0.0  0.0  3                         *00057800
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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
1301204    3        7.31310+6     552.59    0.0  0.0   4                        *00057900
1301300    1                                                                     *00058000
1301301    -6.34     0.0        0.0       1                                     *00058100
1301302    -6.34     0.0        0.0       2                                     *00058200
1301303    -6.34     0.0        0.0       3                                     *00058300
*************************************************************************      *00058400
*  RECIRCULATION INLET PIPE TEE                                               *00058500
1310000    C131     BRANCH                                                     *00058600
1310001    4          1                                                        *00058700
1310101    0.019563  0.416  0.0  0.0  90.0  0.416  0.00005  0.026  00        *00058800
1310200    3      7.32360+6    551.88    0.0                                   *00058900
1311101    130000000 131010000 0.009161 0.0     0.0     0100                  *00059000
1312101    131000000 140000000   0.0     0.75    1.0     0000                 *00059100
1313101    131000000 190000000   0.0     0.75    1.0     0000                 *00059200
1314101    131000000 132010000   0.0     0.0     0.0     0000                 *00059300
1311201     6.34      0.0        0.0                                           *00059400
1312201     3.17      0.0        0.0                                           *00059500
1313201     3.17      0.0        0.0                                           *00059600
1314201    4.1570-4  0.0        0.0                                           *00059700
*************************************************************************      *00059800
*   DEAD ZONE UNDER RECIRCULATION INLET PIPE                                   *00059900
1320000    C132      SNGLVOL                                                   *00060000
1320101    0.019563  0.444  0.0  0.0  90.0  0.444  0.00005  0.026  00        *00060100
1320200    3      7.32690+6    551.42    0.0                                   *00060200
*                                                                             *00060300
*************************************************************************      *00060400
*                                                                             *00060500
*  INTACT RECIRCULATION INLET LINE      (VOLUME23 .... RELAP4J)               *00060600
1400000     C140       PIPE                                                   *00060700
1400001     3                                                                 *00060800
1400101    0.0019244          3                                               *00060900
1400201    0.0                2                                               *00061000
1400301    2.0445             1                                               *00061100
1400302    1.9894             2                                               *00061200
1400303    1.7939             3                                               *00061300
1400401    0.0                3                                               *00061400
1400501    0.0                3                                               *00061500
1400601    -90.0              3                                               *00061600
1400701    -0.154             1                                               *00061700
1400702    -1.704             2                                               *00061800
1400703    -1.315             3                                               *00061900
1400801    0.00005  0.0495    3                                               *00062000
1400901    0.25     0.25      1                                               *00062100
1400902    0.19     0.19      2                                               *00062200
1401001    00                 3                                               *00062300
1401101    0000               2                                               *00062400
1401201    3      7.32250+6    551.80    0.0  0.0   1                        *00062500
1401202    3      7.32770+6    551.73    0.0  0.0   2                        *00062600
1401203    3      7.33740+6    551.69    0.0  0.0   3                        *00062700
1401300    1                                                                 *00062800
1401301    3.17      0.0        0.0       1                                   *00062900
1401302    3.17      0.0        0.0       2                                   *00063000
*************************************************************************      *00063100
*                                                                             *00063200
*  INTACT RECIRCULATION PUMP            (VOLUME24 .... RELAP4J)               *00063300
*                                                                             *00063400
*           NAME          TYPE                                               *00063500
1500000     C150          PUMP                                               *00063600
*                                                                             *00063700
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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*          AREA    LEN    VOL    HZ      VR       ELV  CTL                    *00063800
1500101    0.0    0.26    0.005295   0.0    -90.0    -0.26    0                *00063900
*                                                                             *00064000
*            VOL NO     AREA    F-LOSS R-LOSS  CAHS                          *00064100
1500108    140010000  0.0019244    0.00  0.00  0000                          *00064200
*                                                                             *00064300
*            VOL NO     AREA    F-LOSS R-LOSS  CAHS                          *00064400
1500109    160000000  0.0002746    0.1    0.1   0000                          *00064500
*                                                                             *00064600
*           CTL     PRESSURE       TEMP         ZERO                         *00064700
1500200     3      7.58870+6     552.06     0.0                               *00064800
*                                                                             *00064900
*           CTL     FLOW-F  FLOW-G   VEL                                      *00065000
1500201     1       3.17     0.0      0.0                                     *00065100
*                                                                             *00065200
*           CTL     FLOW-F  FLOW-G   VEL                                      *00065300
1500202     1       3.17     0.0      0.0                                     *00065400
*                                                                             *00065500
*          TAB-D  TWO-P  DIF-T  MOTOR  TAB-S  TRIP   REVER                    *00065600
1500301    0       0       0      -1     -1     509     1                     *00065700
*                                                                             *00065800
*           R-SP    I/R     R-FL    R-HD    R-TOR M-IN  R-DEN                 *00065900
1500302    376.99  0.575    0.0075 262.0  184.2 0.475 1000.0                  *00066000
*                                                                             *00066100
*          R-M-TR    FR-TF2     FR-TF0     FR-TF1     FR-TF3                  *00066200
1500303     0.0        7.56      0.001       0.0        42.7                   *00066300
*                                                                             *00066400
*          ELS TM  MX-F     MX-R                                              *00066500
1500310    0.0      0.0      0.0                                              *00066600
*                                                                             *00066700
* SINGLE PHASE 4 QUADRANT HEAD TABLES                                         *00066800
*                                                                             *00066900
1501100 1  1                                                                  *00067000
1501101  0.00  0.92  0.20  0.94  0.40  0.97  0.60  1.00  1.00  1.00           *00067100
1501200 1  2                                                                  *00067200
1501201  0.00 -0.20  0.25  0.00  0.40  0.12  0.70  0.50  1.00  1.00           *00067300
1501300 1  3                                                                  *00067400
1501301 -1.00  1.20 -0.80  0.98 -0.60  0.94 -0.30  0.92  0.00  0.92           *00067500
1501400 1  4                                                                  *00067600
1501401 -1.00  1.20 -0.80  0.70 -0.50  0.34 -0.20  0.18  0.00  0.18           *00067700
1501500 1  5                                                                  *00067800
1501501  0.00  0.62  0.20  0.69  0.40  0.77  0.60  0.85  1.00  1.00           *00067900
1501600 1  6                                                                  *00068000
1501601  0.00  0.18  0.20  0.22  0.40  0.32  0.65  0.52  1.00  1.00           *00068100
1501700 1  7                                                                  *00068200
1501701 -1.00  0.00 -0.80  0.16 -0.40  0.45 -0.20  0.56  0.00  0.62           *00068300
1501800 1  8                                                                  *00068400
1501801 -1.00  0.00 -0.80 -0.14 -0.50 -0.24 -0.20 -0.24  0.00 -0.20           *00068500
*                                                                             *00068600
* SINGLE PHASE 4 QUADRANT TORQUE TABLES                                       *00068700
*                                                                             *00068800
1501900 2  1                                                                  *00068900
1501901  0.00  0.69              0.50              0.84  1.00  1.00           *00069000
1502000 2  2                                                                  *00069100
1502001  0.00 -0.03  0.10  0.01  0.30  0.13  0.80  0.71  1.00  1.00           *00069200
1502100 2  3                                                                  *00069300
1502101 -1.00  0.76 -0.60  0.44 -0.40  0.44              0.00  0.69           *00069400
1502200 2  4                                                                  *00069500
1502201 -1.00  0.76 -0.70  0.39 -0.20  0.10              0.00  0.10           *00069600
```

```
                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
1502300 2  5                                                                  *00069700
1502301  0.00 -0.72  0.54 -0.69  0.70 -0.58  0.90 -0.48  1.00 -0.33           *00069800
1502400 2  6                                                                  *00069900
1502401  0.00  0.10  0.10  0.10  0.44  0.18  0.70 -0.10  1.00 -0.33           *00070000
1502500 2  7                                                                  *00070100
1502501 -1.00 -1.23 -0.92 -0.82 -0.66 -0.90 -0.26 -0.72  0.00 -0.72           *00070200
1502600 2  8                                                                  *00070300
1502601 -1.00 -1.23 -0.90 -0.95 -0.70 -0.60 -0.24 -0.10  0.00 -0.03           *00070400
*                                                                             *00070500
* 2-PHASE MULTIPLIER TABLES                                                   *00070600
*                                                                             *00070700
1503000 0                                                                     *00070800
1503001  0.0  0.0  0.1  0.0  0.15  0.05  0.24  0.8  0.3  0.96                 *00070900
1503002  0.4  0.98 0.6  0.97 0.80  0.90  0.90  0.8  0.96 0.50                 *00071000
1503003  1.0  1.0                                                            *00071100
1503100 0                                                                     *00071200
1503101  0.0  0.0  0.125 0.07 0.165 0.125 0.24 0.56 0.80 0.56                 *00071300
1503102  0.96 0.45 1.0   0.0                                                  *00071400
*                                                                             *00071500
* 2-PHASE HEAD DIFFERENCE TABLES           * BUILT-IN RELAP4J                 *00071600
*                                                                             *00071700
1504100 1  1                                                                 *00071800
1504101  0.00  0.00  0.10  0.67  0.25  0.91  0.50  1.12                       *00071900
1504102  0.75  1.28  1.00  1.34                                              *00072000
1504200 1  2                                                                  *00072100
1504201  0.00  0.31  0.25  0.42  0.50  0.57  0.75  0.97  1.00  1.34          *00072200
1504300 1  3                                                                  *00072300
1504301 -1.00 -1.18 -0.75 -1.30 -0.50 -1.08 -0.25 -0.93                       *00072400
1504302 -0.10 -0.71  0.00  0.00                                               *00072500
1504400 1  4                                                                  *00072600
1504401 -1.00 -1.18 -0.75 -0.24 -0.50 -0.07 -0.25 -0.08  0.00 -0.19           *00072700
1504500 1  5                                                                  *00072800
1504501  0.00  0.00  0.10 -0.39  0.25 -0.71  0.50 -0.71                       *00072900
1504502  0.75 -0.58  1.00 -0.47                                              *00073000
1504600 1  6                                                                  *00073100
1504601  0.00 -0.19  0.25 -0.45  0.50 -0.55  0.75 -0.59  1.00 -0.47          *00073200
1504700 1  7                                                                  *00073300
1504701 -1.00  0.51 -0.75  0.55 -0.50  0.51 -0.25  0.39  0.00  0.00          *00073400
1504800 1  8                                                                  *00073500
1504801 -1.00  0.51 -0.75  0.31 -0.50  0.22 -0.25  0.21  0.00  0.31          *00073600
*                                                                             *00073700
* 2-PHASE TORQUE DIFFERENCE TABLES         * BUILT-IN RELAP4J                 *00073800
*                                                                             *00073900
1504900 2  1                                                                 *00074000
1504901  0.00  0.00  0.10  0.67  0.25  0.91  0.50  1.12                       *00074100
1504902  0.75  1.28  1.00  1.34                                              *00074200
1505000 2  2                                                                  *00074300
1505001  0.00  0.31  0.25  0.42  0.50  0.57  0.75  0.97  1.00  1.34          *00074400
1505100 2  3                                                                  *00074500
1505101 -1.00 -1.18 -0.75 -1.30 -0.50 -1.08 -0.25 -0.93                       *00074600
1505102 -0.10 -0.71  0.00  0.00                                               *00074700
1505200 2  4                                                                  *00074800
1505201 -1.00 -1.18 -0.75 -0.24 -0.50 -0.07 -0.25 -0.08  0.00 -0.19          *00074900
1505300 2  5                                                                  *00075000
1505301  0.00  0.00  0.10 -0.39  0.25 -0.71  0.50 -0.71                       *00075100
1505302  0.75 -0.58  1.00 -0.47                                              *00075200
1505400 2  6                                                                  *00075300
1505401  0.00 -0.19  0.25 -0.45  0.50 -0.55  0.75 -0.59  1.00 -0.47          *00075400
1505500 2  7                                                                  *00075500

                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
1505501 -1.00  0.51 -0.75  0.55 -0.50  0.51 -0.25  0.39  0.00  0.00          *00075600
1505600 2  8                                                                  *00075700
1505601 -1.00  0.51 -0.75  0.31 -0.50  0.22 -0.25  0.21  0.00  0.31          *00075800
*                                                                             *00075900
*                                                                             *00076000
*****************************************************************************00076100
*                                                                             *00076200
* INTACT RECIRCULATION OUTLET LINE      (VOLUME25,26 .... RELAP4J)            *00076300
*                                                                             *00076400
*            NAME         TYPE                                              *00076500
1600000     C160        PIPE                                                 *00076600
*                                                                             *00076700
1600001     6                                                                 *00076800
1600101     0.0019244      5                                                  *00076900
1600102     0.0            6                                                  *00077000
1600201     0.0            4                                                  *00077100
1600202     0.0023162      5                                                  *00077200
1600301     2.425          1                                                  *00077300
1600302     2.5762         2                                                  *00077400
1600303     3.125          3                                                  *00077500
1600304     2.221          4                                                  *00077600
1600305     1.780          5                                                  *00077700
1600306     0.859          6                                                  *00077800
1600401     0.0            5                                                  *00077900
1600402     0.001776       6                                                  *00078000
1600501     0.0            6                                                  *00078100
1600601     90.0           1                                                  *00078200
1600602     0.0            2                                                  *00078300
1600603     90.0           5                                                  *00078400
1600604     -90.0          6                                                  *00078500
1600701     1.275          1                                                  *00078600
1600702     0.0            2                                                  *00078700
1600703     2.830          3                                                  *00078800
1600704     0.50           4                                                  *00078900
1600705     1.190          5                                                  *00079000
1600706    -0.559          6                                                  *00079100
1600801     0.00005 0.0495    5                                               *00079200
1600802     0.00005 0.0513    6                                               *00079300
1600901     0.295     0.295     1                                            *00079400
1600902    13.903    13.903     2                                            *00079500
1600903     0.085     0.085     3                                            *00079600
1600904     0.112     0.112     4                                            *00079700
1600905     0.336     0.336     5                                            *00079800
1601001     00            6                                                  *00079900
1601101     0000          4                                                  *00080000
1601102     0000          5                                                  *00080100
1601201     3     7.82780+6    552.14   0.0  0.0   1                        *00080200
1601202     3     7.82110+6    552.13   0.0  0.0   2                        *00080300
1601203     3     7.78740+6    552.11   0.0  0.0   3                        *00080400
1601204     3     7.77330+6    552.09   0.0  0.0   4                        *00080500
1601205     3     7.76580+6    552.03   0.0  0.0   5                        *00080600
1601206     3     7.76290+6    552.10   0.0  0.0   6                        *00080700
1601300     1                                                                *00080800
1601301     3.17      0.0      0.0      1                                    *00080900
1601302     3.17      0.0      0.0      2                                    *00081000
1601303     3.17      0.0      0.0      3                                    *00081100
1601304     3.17      0.0      0.0      4                                    *00081200
1601305     3.17      0.0      0.0      5                                    *00081300
*                                                                            *00081400
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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*****************************************************************************
*  INTACT JET PUMP SUCTION LINE                                             *
*700000     C170       SNGLVOL                                               *
*700101     0.003048  1.304  0.0  0.0  0.0  0.0  0.00005  0.0623  00        *
*700200     3   7.29093+6   551.7   0.0                                      *
*                                                                           *
*****************************************************************************
*                                                                           *
*   INTACT JET PUMP SUCTION    ....   SMALL PUMP ASSUMED                     *
*710000     C171       PUMP                                                  *
*710101     0.0   0.973  0.002225  0.0  -90.0  -0.073  0                    *
*710108     170010000   0.003048  0.6438 0.6438 0000                        *
*710109     180000000   0.000474  0.042  0.021  0000                       *
*710200     3   7.39435+6   551.7   0.0                                     *
*710201     1    5.00   0.0   0.0                                           *
*710202     1    5.00   0.0   0.0                                           *
*710301     150  150  150 -1  -1  509  1                                    *
*710302     376.99  0.5092 0.01250  20.0   184.24  1.9  765.76              *
*710303     0.0  0.0  0.0  0.0  0.0                                         *
*710310     0.0  0.0  0.0                                                   *
*                              ....   NAIG JET PUMP MODEL                   *
*710000     C171       SNGLVOL                                             *
*710101     4.743-4  0.203   0.0  0.0  -90.0  -0.0605  0.00005  0.0 00    *
*710200     3  7.29093+6  551.7  0.0                                       *
*                                                                           *
*****************************************************************************
*                                                                           *
*   INTACT JET PUMP          *                                              *
*                                                                           *
*800000   C180    BRANCH                                                   *
*                                                                           *
*800001   2     1                                                          *
*                                                                           *
*800101  5.851-4  0.406 0.0  0.0  -90.0  -0.406  0.00005  0.0273  00       *
*                                                                           *
*800200  3   7.38813+6   551.7   0.0                                       *
*                                                                           *
*801101  160010000 180000000  1.108-4    0.936 0.510 0000                 *
*802101  180010000 185000000  5.851-4    0.07  0.01  0000                 *
*                                                                           *
*801201   3.00   0.0  0.0                                                  *
*802201   8.00   0.0  0.0                                                  *
*                                                                           *
*****************************************************************************
* INTACT JET PUMP SUCTION LINE (MODEFIED FOR JAERI JET PUMP MODEL)          *
*****************************************************************************
1700000   C170  PIPE                                                       *
1700001   2                                                                *
1700101   0.003048  1                                                      *
1700102   0.002316  2                                                      *
1700201   0.002316  1                                                      *
1700301   1.304     1                                                      *
1700302   0.973     2                                                      *
1700601   0.0       1                                                      *
1700602   -90.0     2                                                      *
1700701   0.0       1                                                      *
1700702   -0.073    2                                                      *
1700801   0.00005   0.0623    1                                           *
1700802   0.00005   0.0       2                                           *

                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
1700901   1.05 1.05 1                                                      *
1701001   00        2                                                      *
1701101   0000      1                                                      *
1701201   3  7.30780+6  552.69 0.0  0.0  1                               *
1701202   3  7.30150+6  554.50 0.0  0.0  2                               *
1701300   1                                                                *
1701301  4.94   0.0  0.0       1                                          *
*****************************************************************************
* JAERI JET PUMP MODEL (INTACT LOOP) *                                     *
*****************************************************************************
1800000   C180  JETPUMP                                                   *
1800001   3  1                                                            *
1800101   0.0 0.402 7.0421-4  0.0 -90.0 -0.402 0.00005 0.0334 00         *
1800200   3 7.34120+6 552.43                                              *
1800301   0.05349 0.01566 0.0084 0.0193 0.021  0.0193 0.0495             *
1800401   0.033 0.025 0.0 0.117 0.285                                     *
1800501   0.024 0.024 0.0 0.024 1.8   0.024                              *
1800601   2                                                              *
1801101   160010000 180000000  1.108-4  0.936 2.0   0000               *
1802101   170010000 180000000  1.342-3  3.22  0.650 0000               *
1803101   180010000 185000000  3.849-3  0.0   0.0   0000               *
1801201   3.17    0.0  0.0                                               *
1802201   4.94    0.0  0.0                                               *
1803201   8.11    0.0  0.0                                               *
*****************************************************************************
*                                                                           *
*  INTACT JET PUMP OUTLET LINE          (VOLUME22 .... RELAP4J)            *
*                                                                           *
*          NAME         TYPE                                              *
1850000    C185         PIPE                                              *
1850001   4                                                               *
1850101   0.003849   1                                                    *
1850102   0.0        2                                                    *
1850103   0.004289   4                                                    *
1850201   0.003849   1                                                    *
1850202   0.004289   2                                                    *
1850203   0.0        3                                                    *
1850301   1.396      1                                                    *
1850302   0.4243     2                                                    *
1850303   2.0864     3                                                    *
1850304   1.8464     4                                                    *
1850401   0.0        1                                                    *
1850402   0.003073   2                                                    *
1850403   0.0        4                                                    *
1850501   0.0        4                                                    *
1850601   -90.0      4                                                    *
1850701   -1.396     1                                                    *
1850702   -0.300     2                                                    *
1850703   -0.240     3                                                    *
1850704   -0.2729    4                                                    *
1850801   0.00005 0.0700   1                                             *
1850802   0.00005 0.0960   2                                             *
1850803   0.00005 0.0739   3                                             *
1850804   0.00005 0.0739   4                                             *
1850901   3.597  3.597  1                                                *
1850902   0.3    1.00   2                                                *
1850903   0.832  0.832  3                                                *
1851001   00         4                                                   *
1851101   0000       3                                                   *
```

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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
1851201    3     7.35640+6    552.40    0.0  0.0  1                          *00093300
1851202    3     7.35360+6    552.38    0.0  0.0  2                          *00093400
1851203    3     7.35260+6    552.30    0.0  0.0  3                          *00093500
1851204    3     7.35140+6    552.22    0.0  0.0  4                          *00093600
1851300    1                                                                 *00093700
1851301    8.11      0.0      0.0      1                                     *00093800
1851302    8.11      0.0      0.0      2                                     *00093900
1851303    8.11      0.0      0.0      3                                     *00094000
*                                                                            *00094100
*****************************************************************************00094200
*                                                                            *00094300
*  BROKEN RECIRCULATION INLET LINE      (VOLUME15 .... RELAP4J)              *00094400
*                                                                            *00094500
*           NAME          TYPE                                             *00094600
1900000    C190          PIPE                                               *00094700
1900001    3                                                                *00094800
1900101    0.0019244       3                                                *00094900
1900201    0.0             2                                                *00095000
1900301    2.1317          1                                                *00095100
1900302    2.5127          2                                                *00095200
1900303    2.5424          3                                                *00095300
1900401    0.0             3                                                *00095400
1900501    0.0             3                                                *00095500
1900601    -90.0           2                                                *00095600
1900602    0.0             3                                                *00095700
1900701    -0.154          1                                                *00095800
1900702    -1.285          2                                                *00095900
1900703    -0.0            3                                                *00096000
1900801    0.00005  0.0495    3                                             *00096100
1900901    0.185    0.185     1                                             *00096200
1900902    0.345    0.345     2                                             *00096300
1901001    00             3                                                 *00096400
1901101    0000           2                                                 *00096500
1901201    3     7.32220+6    551.80    0.0  0.0  1                          *00096600
1901202    3     7.32570+6    551.72    0.0  0.0  2                          *00096700
1901203    3     7.32820+6    551.67    0.0  0.0  3                          *00096800
1901300    1                                                                 *00096900
1901301    3.17      0.0      0.0      1                                     *00097000
1901302    3.17      0.0      0.0      2                                     *00097100
*                                                                            *00097200
*****************************************************************************00097300
*                                                                            *00097400
*  BROKEN RECIRCULATION INLET LINE      (VOLUME16 .... RELAP4J)              *00097500
*                                                                            *00097600
*           NAME          TYPE                                             *00097700
2000000    C200          PIPE                                               *00097800
2000001    3                                                                *00097900
2000101    0.0019244       3                                                *00098000
2000201    0.0             2                                                *00098100
2000301    2.0659          1                                                *00098200
2000302    2.6398          2                                                *00098300
2000303    2.3574          3                                                *00098400
2000401    0.0             3                                                *00098500
2000501    0.0             3                                                *00098600
2000601    -90.0           1                                                *00098700
2000602    0.0             2                                                *00098800
2000603    -90.0           3                                                *00098900
2000701    -0.219          1                                                *00099000
2000702    -0.0            2                                                *00099100

                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
2000703    -1.515          3                                                *00099200
2000801    0.00005 0.0495   3                                               *00099300
2000901    0.325    0.325    1                                              *00099400
2000902    0.17     0.17     2                                              *00099500
2001001    00             3                                                 *00099600
2001101    0000           2                                                 *00099700
2001201    3     7.32410+6    551.65    0.0  0.0  1                          *00099800
2001202    3     7.32280+6    551.64    0.0  0.0  2                          *00099900
2001203    3     7.32650+6    551.64    0.0  0.0  3                          *00100000
2001300    1                                                                 *00100100
2001301    3.17      0.0      0.0      1                                     *00100200
2001302    3.17      0.0      0.0      2                                     *00100300
*                                                                            *00100400
*****************************************************************************00100500
*                                                                            *00100600
*  BROKEN RECIRCULATION PUMP            (VOLUME17 .... RELAP4J)             *00100700
*                                                                            *00100800
*           NAME          TYPE                                             *00100900
2100000    C210          PUMP                                               *00101000
*                                                                            *00101100
*          AREA   LEN    VOL    HZ     VR     ELV    CTL                    *00101200
2100101   0.0  0.26    0.005295  0.0   -90.0  -0.26    0                    *00101300
*                                                                            *00101400
*           VOL NO     AREA     F-LOSS R-LOSS CAHS                          *00101500
2100108    200010000  0.0019244   0.00   0.00   0000                       *00101600
*                                                                            *00101700
*           VOL NO     AREA     F-LOSS R-LOSS CAHS                          *00101800
2100109    220000000  0.0002746   0.1     0.1     0000                      *00101900
*                                                                            *00102000
*          CTL     PRESSURE       TEMP        ZERO                         *00102100
2100200     3      7.60230+6     552.11      0.0                           *00102200
*                                                                            *00102300
*          CTL     FLOW-F  FLOW-G   VELJ                                    *00102400
2100201     1      3.17    0.0      0.0                                     *00102500
*                                                                            *00102600
*          CTL     FLOW-F  FLOW-G   VELJ                                    *00102700
2100202     1      3.17    0.0      0.0                                     *00102800
*                                                                            *00102900
*          TAB-D    TWO-P     DIF-T    MOTOR  TAB-S  TRIP  REVER           *00103000
2100301     150      150       150      -1     -1     510     1             *00103100
*                                                                            *00103200
*          R-SP   I/R     R-FL    R-HD    R-TOR M-IN  R-DEN                 *00103300
2100302    376.99  0.580   0.0075 262.0 184.2 0.475 1000.0                  *00103400
*                                                                            *00103500
*         R-M-TR   FR-TF2     FR-TFO     FR-TF1     FR-TF3                  *00103600
2100303    0.0       7.56       0.001      0.0       42.7                   *00103700
*                                                                            *00103800
*         ELS TM  MX-F     MX-R                                            *00103900
2100310   0.0     0.0      0.0                                             *00104000
*                                                                            *00104100
*****************************************************************************00104200
*                                                                            *00104300
*  BROKEN RECIRCULATION OUTLET LINE     (VOLUME18,19.. RELAP4J)             *00104400
*                                                                            *00104500
*           NAME          TYPE                                             *00104600
2200000    C220          PIPE                                               *00104700
*                                                                            *00104800
*          NO.VOL                                                          *00104900
2200001    5                                                               *00105000
```

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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
2200101    0.0019244          4                                                *00105100
2200102    0.0                5                                                *00105200
2200201    0.0                3                                                *00105300
2200202    0.0023162          4                                                *00105400
2200301    2.0046             1                                                *00105500
2200302    2.5762             2                                                *00105600
2200303    2.6315             3                                                *00105700
2200304    2.2613             4                                                *00105800
2200305    0.859              5                                                *00105900
2200401    0.0                4                                                *00106000
2200402    0.001776           5                                                *00106100
2200501    0.0                5                                                *00106200
2200601    90.0               1                                                *00106300
2200602    0.0                2                                                *00106400
2200603    90.0               4                                                *00106500
2200604    -90.0              5                                                *00106600
2200701    1.275              1                                                *00106700
2200702    0.0                2                                                *00106800
2200703    2.3485             3                                                *00106900
2200704    2.1715             4                                                *00107000
2200705    -0.559             5                                                *00107100
2200801    0.00005 0.0495   4                                                  *00107200
2200802    0.00005 0.0513   5                                                  *00107300
2200901    0.26       0.26       1                                             *00107400
2200902   13.903     13.903      2                                             *00107500
2200903    0.085      0.085      3                                             *00107600
2200904    0.414      0.414      4                                             *00107700
2201001    00                 5                                               *00107800
2201101    0000               4                                               *00107900
2201201    3    7.86520+6   552.21   0.0  0.0  1                              *00108000
2201202    3    7.85850+6   552.22   0.0  0.0  2                              *00108100
2201203    3    7.82500+6   552.21   0.0  0.0  3                              *00108200
2201204    3    7.80640+6   552.15   0.0  0.0  4                              *00108300
2201205    3    7.79860+6   552.21   0.0  0.0  5                              *00108400
2201300    1                                                                  *00108500
2201301    3.17      0.0       0.0       1                                     *00108600
2201302    3.17      0.0       0.0       2                                     *00108700
2201303    3.17      0.0       0.0       3                                     *00108800
2201304    3.17      0.0       0.0       4                                     *00108900
*                                                                             *00109000
*****************************************************************************00109100
*                                                                             *00109200
*  BROKEN JET PUMP SUCTION LINE                                               *00109300
*300000    C230        SNGLVOL                                                *00109400
*300101    0.003048  1.304  0.0  0.0  0.0  0.0  0.00005  0.0623  00           *00109500
*300200    3   7.29093+6   551.7   0.0                                        *00109600
*                                                                             *00109700
*****************************************************************************00109800
*                                                                             *00109900
*  BROKEN JET PUMP SUCTION   ....  SMALL PUMP ASSUMED                         *00110000
*310000    C231        PUMP                                                   *00110100
*310101    0.0  0.973  0.002225  0.0  -90.0  -0.073  0                        *00110200
*310108    230010000    0.003048  0.6438 0.6438 0000                          *00110300
*310109    240000000     0.000474   0.042 0.021 0000                         *00110400
*310200    3    7.39435+6   551.7   0.0                                      *00110500
*310201    1      5.00      0.0      0.0                                      *00110600
*310202    1      5.00      0.0      0.0                                      *00110700
*310301    150   150   150  -1   -1   510   1                                *00110800
*310302    376.99  0.5344 0.01250 20.0   184.24  1.9  765.76                 *00110900

                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*310303    0.0   0.0   0.0   0.0   0.0                                        *00111000
*310310    0.0   0.0   0.0                                                    *00111100
*                          ....  NAIG JET PUMP MODEL                          *00111200
*310000    C231        SNGLVOL                                                *00111300
*310101    4.743-4  0.203   0.0  0.0  -90.0  -0.0605  0.00005  0.0  00       *00111400
*310200    3  7.29093+6  551.7  0.0                                           *00111500
*                                                                             *00111600
*****************************************************************************00111700
*                                                                             *00111800
*   BROKEN JET PUMP                                                           *00111900
*                                                                             *00112000
*400000    C240     BRANCH                                                   *00112100
*                                                                             *00112200
*400001    2      1                                                          *00112300
*                                                                             *00112400
*400101  5.851-4   0.406  0.0  0.0  -90.0  -0.406  0.00005  0.0273  00       *00112500
*                                                                             *00112600
*400200  3    7.38813+6   551.7    0.0                                       *00112700
*                                                                             *00112800
*401101  220010000 240000000  1.108-4    0.936   0.510   0000               *00112900
*402101  240010000 245000000  5.851-4    0.07    0.01    0000               *00113000
*                                                                             *00113100
*401201   3.00     0.0      0.0                                              *00113200
*402201   8.00     0.0      0.0                                              *00113300
*                                                                             *00113400
*****************************************************************************00113500
* BROKEN JET PUMP SUCTION LINE (MODEFIED FOR JAERI JET PUMP MODEL)            *00113600
*****************************************************************************00113700
2300000   C230  PIPE                                                         *00113800
2300001   2                                                                  *00113900
2300101   0.003048  1                                                        *00114000
2300102   0.002316  2                                                        *00114100
2300201   0.002316  1                                                        *00114200
2300301   1.304     1                                                        *00114300
2300302   0.973     2                                                        *00114400
2300601   0.0       1                                                        *00114500
2300602   -90.0     2                                                        *00114600
2300701   0.0       1                                                        *00114700
2300702   -0.073    2                                                        *00114800
2300801   0.00005   0.0623    1                                             *00114900
2300802   0.00005   0.0       2                                             *00115000
2300901   1.05 1.05 1                                                        *00115100
2301001   00        2                                                        *00115200
2301101   0000      1                                                        *00115300
2301201   3  7.30840+6  552.69 0.0  0.0  1                                  *00115400
2301202   3  7.30370+6  554.50 0.0  0.0  2                                  *00115500
2301300   1                                                                  *00115600
2301301  4.94   0.0  0.0       1                                             *00115700
*****************************************************************************00115800
* JAERI JET PUMP MODEL (BROKEN LOOP) *                                       *00115900
*****************************************************************************00116000
2400000   C240  JETPUMP                                                      *00116100
2400001   3  1                                                               *00116200
2400101   0.0 0.402 7.0421-4  0.0 -90.0 -0.402 0.00005 0.0334 00            *00116300
2400200   3 7.34460+6 552.47                                                 *00116400
2400301   0.05349 0.01566 0.0084 0.0193 0.021  0.0193 0.0495                 *00116500
2400401   0.033 0.025 0.0 0.117 0.285                                        *00116600
2400501   0.024 0.024 0.0 0.024 1.6   0.024                                 *00116700
2400601   2                                                                  *00116800
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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
2401101   220010000 240000000  1.108-4  0.936 2.0   0000                *00116900
2402101   230010000 240000000  1.342-3  3.22  0.650 0000                *00117000
2403101   240010000 245000000  3.849-3  0.0   0.0   0000                *00117100
2401201   3.17     0.0  0.0                                              *00117200
2402201   4.94     0.0  0.0                                              *00117300
2403201   8.11     0.0  0.0                                              *00117400
*************************************************************************00117500
*                                                                        *00117600
*  BROKEN JET PUMP OUTLET LINE          (VOLUME14 .... RELAP4J)          *00117700
*                                                                        *00117800
*           NAME         TYPE                                           *00117900
2450000     C245         PIPE                                           *00118000
2450001     4                                                           *00118100
2450101    0.003849     1                                               *00118200
2450102    0.0          2                                               *00118300
2450103    0.004289     4                                               *00118400
2450201    0.003849     1                                               *00118500
2450202    0.004289     2                                               *00118600
2450203    0.0          3                                               *00118700
2450301    1.396        1                                               *00118800
2450302    0.4243       2                                               *00118900
2450303    2.0864       3                                               *00119000
2450304    1.8464       4                                               *00119100
2450401    0.0          1                                               *00119200
2450402    0.003073     2                                               *00119300
2450403    0.0          4                                               *00119400
2450501    0.0          4                                               *00119500
2450601    -90.0        4                                               *00119600
2450701    -1.396       1                                               *00119700
2450702    -0.3000      2                                               *00119800
2450703    -0.240       3                                               *00119900
2450704    -0.2729      4                                               *00120000
2450801    0.00005 0.0700   1                                           *00120100
2450802    0.00005 0.0960   2                                           *00120200
2450803    0.00005 0.0739   4                                           *00120300
2450901    5.369    5.369    1                                          *00120400
2450902    0.3      1.0      2                                          *00120500
2450903    0.832    0.832    3                                          *00120600
2451001    00         4                                                 *00120700
2451101    0000       3                                                 *00120800
2451201    3     7.3616e+6   552.44  0.0  0.0  1                       *00120900
2451202    3     7.3534e+6   552.42  0.0  0.0  2                       *00121000
2451203    3     7.3526e+6   552.35  0.0  0.0  3                       *00121100
2451204    3     7.3514e+6   552.28  0.0  0.0  4                       *00121200
2451300    1                                                           *00121300
2451301   8.11      0.0     0.0     1                                   *00121400
2451302   8.11      0.0     0.0     2                                   *00121500
2451303   8.11      0.0     0.0     3                                   *00121600
*                                                                       *00121700
*************************************************************************00121800
*  QUICK SHUTT-OFF VALVE      NOT USED IN THE SMALL BREAK TEST SERIES   *00121900
2500000     C250         VALVE                                          *00122000
2500101    190010000 200000000  0.0019244  2.0   2.0   0000            *00122100
2500201    1   3.0341  0.0   0.0                                        *00122200
2500300     TRPVLV                                                      *00122300
2500301                513                                             *00122400
*                                                                       *00122500
*************************************************************************00122600
*                                                                       *00122700
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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*  VESSEL SIDE BREAK  (BRK B)          (JUNCTION55 .... RELAP4J)         *00122800
*                                                                        *00122900
*           NAME         TYPE                                           *00123000
2600000     C260         VALVE                                          *00123100
*                                                                        *00123200
*            FR          TO        AREA     F-LOS  R-LOS CAHS           *00123300
2600101   190010000 550000000  19.24-4    0.0    0.0   0100            *00123400
*                                                                        *00123500
*          CTL     FLOW-F FLOW-G  VELJ                                  *00123600
2600201     1       0.0    0.0     0.0                                   *00123700
*                                                                        *00123800
*          VALVE TYPE     TRIP.NO                                       *00123900
2600300     TRPVLV                                                      *00124000
2600301                     502                                         *00124100
*                                                                       *00124200
*************************************************************************00124300
5500000     C550         SNGLVOL                                        *00124400
5500101    19.24-4  0.4  0.0  0.0  0.0  0.0  0.00005  0.0495  00        *00124500
5500200    3    7.35350+6   511.7   0.0                                *00124600
*                                                                       *00124700
5550000     C555         VALVE                                          *00124800
5550101    550010000 560000000  5.391-4    0.0    0.0    0100         *00124900
5550201    1    0.0   0.0   0.0                                        *00125000
5550300     TRPVLV                                                      *00125100
5550301                     502                                         *00125200
*                                                                       *00125300
5600000     C560         SNGLVOL                                        *00125400
5600101    5.391-4  0.3  0.0  0.0  0.0  0.0  0.00005  0.0262  00       *00125500
5600200    3    7.35350+6   511.7   0.0                                *00125600
*                                                                       *00125700
5650000     C565         VALVE                                          *00125800
5650101    560010000 280000000  5.391-4    0.0    0.0    0100         *00125900
5650201    1    0.0   0.0   0.0                                        *00126000
5650300     TRPVLV                                                      *00126100
5650301                     502                                         *00126200
*************************************************************************00126300
*  PUMP SIDE BREAK  ( BRK A)       NOT USED IN THE SMALL BREAK TEST     *00126400
2700000     C270         VALVE                                          *00126500
2700101    200000000 551000000  19.24-4    0.0    0.0    0100         *00126600
2700201    1    0.0   0.0   0.0                                        *00126700
2700300     TRPVLV                                                      *00126800
2700301                     502                                         *00126900
*************************************************************************00127000
5510000     C551         SNGLVOL                                        *00127100
5510101    19.24-4  0.4  0.0  0.0  0.0  0.0  0.00005  0.0495  00        *00127200
5510200    3    7.35350+6   511.7   0.0                                *00127300
*                                                                       *00127400
5560000     C556         VALVE                                          *00127500
5560101    551010000 561000000  5.391-4    0.0    0.0    0100         *00127600
5560201    1    0.0   0.0   0.0                                        *00127700
5560300     TRPVLV                                                      *00127800
5560301                     502                                         *00127900
*                                                                       *00128000
5610000     C561         SNGLVOL                                        *00128100
5610101    5.391-4  0.3  0.0  0.0  0.0  0.0  0.00005  0.0262  00       *00128200
5610200    3    7.35350+6   511.7   0.0                                *00128300
*                                                                       *00128400
5660000     C566         VALVE                                          *00128500
5660101    561010000 281000000  5.391-4    0.0    0.0    0100         *00128600
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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
5660201     1   0.0   0.0   0.0                                                *00128700
5660300     TRPVLV                                                           *00128800
5660301                   502                                                *00128900
*******************************************************************************00129000
*                                                                              *00129100
*  CONTAINTMENT                                                                *00129200
*           NAME         TYPE                                                  *00129300
2800000     C280         TMDPVOL                                               *00129400
*                                                                              *00129500
*          AREA  LEN   VOL    HZ   VR  ELV  ROU  HYD  FE                       *00129600
2800101   1.0+3  0.0  1.0+6  0.0  0.0  0.0  0.0  0.0  11                       *00129700
*                                                                              *00129800
*          CTL                                                                 *00129900
2800200     3                                                                  *00130000
*                                                                              *00130100
*          TIME     PRESSURE  TEMP                                            *00130200
2800201     0.0      9.8043+4   303.15     * CONSTANT                         *00130300
*                                                                              *00130400
*******************************************************************************00130500
*                                                                              *00130600
*  MAIN STEAM RESERVOIR                * ENTHALPY CALCULATION                 *00130700
*                                                                              *00130800
*           NAME         TYPE                                                  *00130900
2900000     C290         TMDPVOL                                               *00131000
*                                                                              *00131100
*                                                                              *00131200
2900101   1.0+3  0.0  1.0+6  0.0  0.0  0.0  0.0  0.0  11                       *00131300
*                                                                              *00131400
*          CTL                                                                 *00131500
2900200     2                                                                  *00131600
*                                                                              *00131700
*          TIME    PRESSURE   TEMP                                           *00131800
2900201     0.0     7.2900+6   1.0          * CONSTANT                        *00131900
*                                                                              *00132000
*******************************************************************************00132100
*                                                                              *00132200
*  MAIN STEAM                                                                  *00132300
*                                                                              *00132400
*           NAME         TYPE                                                  *00132500
3000000     C300         TMDPJUN                                               *00132600
*                                                                              *00132700
*            FR         TO        AREA                                        *00132800
3000101   290000000 080010000  1.0                                             *00132900
*                                                                              *00133000
*          CTL                                                                 *00133100
3000200     0                                                                  *00133200
*                                                                              *00133300
*          TIME       FLOW-F    FLOW-G  VELJ                                  *00133400
3000201     0.0        0.0     -0.053613  0.0 ****************************     *00133500
3000202     0.5        0.0     -0.052595  0.0 *                               *00133600
3000203     1.0        0.0     -0.051853  0.0 *                               *00133700
3000204     1.5        0.0     -0.051082  0.0 *                               *00133800
3000205     2.0        0.0     -0.050847  0.0 *                               *00133900
3000206     2.5        0.0     -0.051923  0.0 *                               *00134000
3000207     3.0        0.0     -0.055692  0.0 *       COMMMENT;               *00134100
3000208     3.5        0.0     -0.063195  0.0 *                               *00134200
3000209     4.0        0.0     -0.060000  0.0 *    DATA FROM R926PST1         *00134300
3000210     4.5        0.0     -0.059759  0.0 *                               *00134400
3000211     5.0        0.0     -0.060135  0.0 *                               *00134500

                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
3000212     5.5        0.0     -0.060135  0.0 *                               *00134600
3000213     6.0        0.0     -0.059383  0.0 *                               *00134700
3000214     6.5        0.0     -0.052310  0.0 *                               *00134800
3000215     7.0        0.0     -0.039865  0.0 *                               *00134900
3000216     7.5        0.0     -0.025893  0.0 *                               *00135000
3000217     8.0        0.0     -0.014550  0.0 *                               *00135100
3000218     8.5        0.0     -0.001305  0.0 *                               *00135200
3000219     9.0        0.0       0.0      0.0 *                               *00135300
3000220   129.0        0.0       0.0      0.0 *                               *00135400
3000221   131.7        0.0     -0.041101  0.0 *                               *00135500
3000222   153.5        0.0     -0.047110  0.0 *                               *00135600
3000223   189.2        0.0     -0.055025  0.0 *                               *00135700
3000224   205.0        0.0     -0.064701  0.0 *                               *00135800
3000225  1000.         0.0       0.0      0.0 ****************************     *00135900
*                                                                              *00136000
*******************************************************************************00136100
*                                                                              *00136200
*  HPCS RESERVOIR                                                              *00136300
*                                                                              *00136400
*2920000     C292    TMDPVOL                                                   *00136500
*2920101     1.0+3  0.0  1.0+6  0.0  0.0  0.0  0.0  0.0  11                   *00136600
*2920200     3                                                                 *00136700
*2920201     0.0   0.0980+6   303.15       * CONSTANT                         *00136800
*                                                                              *00136900
*******************************************************************************00137000
*                                                                              *00137100
*  HPCS                                                                        *00137200
*                                                                              *00137300
*3020000     C302    TMDPJUN                                                   *00137400
*3020101     292000000  051010000   1.157-3                                    *00137500
*3020200     0                                                                 *00137600
*3020201     0.0        0.0       0.0     0.0    *                           *00137700
*3020202    31.5        0.0       0.0     0.0    *                           *00137800
*3020203    33.8        0.628     0.0     0.0    *                           *00137900
*3020204    34.3        0.670     0.0     0.0    *                           *00138000
*3020205    35.6        0.681     0.0     0.0    *                           *00138100
*3020206    37.5        0.686     0.0     0.0    *                           *00138200
*3020207    60.0        0.696     0.0     0.0    *                           *00138300
*3020208    90.0        0.702     0.0     0.0    *                           *00138400
*3020209   180.0        0.712     0.0     0.0    *                           *00138500
*3020210  1000.0        0.712     0.0     0.0    *                           *00138600
*                                                                              *00138700
*******************************************************************************00138800
*                                                                              *00138900
=      FEEDWATER RESERVOIR              * ENTHALPY CALCULATION                 *00139000
*                                                                              *00139100
*           NAME         TYPE                                                  *00139200
3100000     C310         TMDPVOL                                               *00139300
*                                                                              *00139400
*          AREA  LEN   VOL    HZ   VR   ELV  ROU  HYD  FE                      *00139500
3100101   1.0+3  0.0  1.0+6  0.0  0.0  0.0  0.0  0.0  11                       *00139600
*                                                                              *00139700
*          CTL                                                                 *00139800
3100200     3                                                                  *00139900
*                                                                              *00140000
*          TIME   PRESSURE  TEMP                                               *00140100
3100201     0.0    7.5001+6   489.0        * CONSTANT                         *00140200
*                                                                              *00140300
*******************************************************************************00140400
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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*                                                                              *00140500
*       FEEDWATER                          *JUNCTION51 .... RELAP4J            *00140600
*                                                                              *00140700
*            NAME          TYPE                                                *00140800
3200000      C320          TMDPJUN                                             *00140900
*                                                                              *00141000
*             FR           TO          AREA                                    *00141100
3200101   310000000 111010000   1.0                                            *00141200
*                                                                              *00141300
*           CTL                                                                *00141400
3200200     1                                                                  *00141500
*                                                                              *00141600
*           TIME       FLOW-F    FLOE-G  VELJ                                  *00141700
3200201      0.0       2.0980    0.0     0.0 ***********************************00141800
3200202      0.5       2.0396    0.0     0.0 *                                 *00141900
3200203      1.0       2.0192    0.0     0.0 *                                 *00142000
3200204      1.5       2.0192    0.0     0.0 *      COMMENT;                   *00142100
3200205      2.0       1.2550    0.0     0.0 *      DATA FROM R926PST1         *00142200
3200206      2.5       0.3856    0.0     0.0 *                                 *00142300
3200207      3.0       0.0897    0.0     0.0 *                                 *00142400
3200208      3.5       0.0177    0.0     0.0 *                                 *00142500
3200209      4.0       0.0       0.0     0.0 *                                 *00142600
3200210   1000.0       0.0       0.0     0.0 ***************************************00142700
*                                                                              *00142800
********************************************************************************00142900
*                                                                              *00143000
*  LPCI                                                                        *00143100
*                                                                              *00143200
4010000      C401          TMDPJUN                                             *00143300
*             FR           TO          AREA                                    *00143400
4010101   331000000 100010000   1.0                                            *00143500
*           CTL                                                                *00143600
4010200     1                                                                  *00143700
*                                                                              *00143800
*           TIME       FLOW-F    FLOW-G    VELJ                               *00143900
4010201      0.0       0.0       0.0       0.0 ***************************************00144000
4010202     96.0       0.0       0.0       0.0 *                               *00144100
4010203     97.1       2.6336    0.0       0.0 *       COMMENT;                *00144200
4010204    106.5       2.1341    0.0       0.0 *                               *00144300
4010205    118.6       3.3764    0.0       0.0 *     DATA FROM R926PST1        *00144400
4010206    137.2       3.5909    0.0       0.0 *                               *00144500
4010207    150.4       3.6862    0.0       0.0 *                               *00144600
4010208    165.0       3.7219    0.0       0.0 *                               *00144700
4010209    205.0       3.7339    0.0       0.0 *                               *00144800
4010210   1000.0       0.0       0.0       0.0 ***************************************00144900
*                                                                              *00145000
********************************************************************************00145100
*                                                                              *00145200
*  LPCS                                                                        *00145300
*                                                                              *00145400
4020000      C402          TMDPJUN                                             *00145500
*             FR           TO          AREA                                    *00145600
4020101    332000000   051010000   1.0                                         *00145700
*           CTL                                                                *00145800
4020200     1                                                                  *00145900
*                                                                              *00146000
*           TIME       FLOW-F    FLOW-G    AREA                               *00146100
4020201      0.0       0.0       0.0       0.0 ***************************************00146200
4020202     71.3       0.0       0.0       0.0 *                               *00146300
```

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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
4020203     72.2       0.7269    0.0       0.0 *                               *00146400
4020204     85.0       0.8199    0.0       0.0 *       COMMENT;                *00146500
4020205    105.0       0.9565    0.0       0.0 *                               *00146600
4020206    111.8       0.9962    0.0       0.0 *     DATA FROM R926PST1        *00146700
4020207    125.0       1.0224    0.0       0.0 *                               *00146800
4020208    145.0       1.0550    0.0       0.0 *                               *00146900
4020209    165.0       1.0741    0.0       0.0 *                               *00147000
4020210    205.0       1.0773    0.0       0.0 *                               *00147100
4020211   1000.0       0.0       0.0       0.0 ***************************************00147200
*                                                                              *00147300
********************************************************************************00147400
*                                                                              *00147500
**********          HEAT SLABS                              ********************00147600
*                                                                              *00147700
********************************************************************************00147800
*                                                                              *00147900
*  CORE     **** COMPOSED OF BN,HEATER,BN,INC600 ****                          *00148000
*      ***** HIGH POWER CHANNEL     (A CHANNEL)    10010000  ***********        *00148100
*      ***** AVERAGE POWER CHANNEL (B,C,D CHANNEL)10020000  ***********        *00148200
*                                                                              *00148300
****** AVERAGE POWER CHANNEL HEAT STRUCTURE ***************************************00148400
*                                                                              *00148500
*           NH    NP    TYPE  S-FLG  L-COR                                     *00148600
10010000     7     9     2     1      0.0                                       *00148700
*                                                                              *00148800
*           LOC-F MESH-F                                                       *00148900
10010100    0     1                                                            *00149000
*                                                                              *00149100
*           NO ITV R-COR      NO ITV  R-COR       NO ITV  R-COR                *00149200
10010101    3     0.003051 ,  1     0.0037511,  1     0.004835,                *00149300
10010102    3     0.006135                                                     *00149400
*                                                                              *00149500
*           FLG                                                                *00149600
*0010200    0                                                                  *00149700
*                                                                              *00149800
*           CMP NO                                                             *00149900
10010201    1   3, 2    4, 3    5, 4    8                                      *00150000
*                                                                              *00150100
*           FLG                                                                *00150200
*0010300    0                                                                  *00150300
*                                                                              *00150400
*           SOURCE                                                             *00150500
10010301    0.0  3, 1.0  4, 0.0  5, 0.0  8                                     *00150600
*                                                                              *00150700
*           FLG                                                                *00150800
10010400    0                                                                  *00150900
*                                                                              *00151000
*           TEMP      NP                                                       *00151100
10010401    554.8     9                                                        *00151200
*                                                                              *00151300
*LEFT       B.V.  INC   BCT   A-C    AREA   NH                                 *00151400
10010501    0     0     0     0      0.0    7                                  *00151500
*                                                                              *00151600
*RIGHT        B.V          INC   BCT  A-C  SARFACE  NH                          *00151700
10010601   040010000    10000    1    0    1.6849   3                         *00151800
10010602   040040000        0    1    0    3.3698   4                         *00151900
10010603   040050000    10000    1    0    1.6849   7                         *00152000
*                                                                              *00152100
*           TYPE   IS MULTI   L-D-H  R-D-H     NH                             *00152200
```

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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
10010701    900     0.04109      0.0     0.0        1                        *00152300
10010702    900     0.07690      0.0     0.0        2                        *00152400
10010703    900     0.10360      0.0     0.0        3                        *00152500
10010704    900     0.23860      0.0     0.0        4                        *00152600
10010705    900     0.10360      0.0     0.0        5                        *00152700
10010706    900     0.07690      0.0     0.0        6                        *00152800
10010707    900     0.04109      0.0     0.0        7                        *00152900
*                                                                           *00153000
*LEFT      CHF     HYD      HEQ      CHAN     NH                            *00153100
10010801    0      0.0      0.0      0.0      7                             *00153200
*                                                                           *00153300
*RIGHT     CHF     HYD      HEQ      CHAN     NH                            *00153400
10010901    0      0.01306 0.01348 0.2350     3                             *00153500
10010902    0      0.01306 0.01348 0.4700     4                             *00153600
10010903    0      0.01306 0.01348 0.2350     7                             *00153700
*                                                                           *00153800
********** HIGH POWER CHANNEL HEAT STRUCTURE **************************** *00153900
*                                                                           *00154000
10020000    7   9   2   1   0.0                                             *00154100
10020100    0010                                                            *00154200
*0020200    0010                                                            *00154300
*0020300    0010                                                            *00154400
10020400    0010                                                            *00154500
10020501    0   0   0   0   0.0   7                                         *00154600
10020601    045010000    10000    1    0    0.5616    3                    *00154700
10020602    045040000         0    1    0    1.1233    4                   *00154800
10020603    045050000    10000    1    0    0.5616    7                    *00154900
10020701    900     0.01918  0.0      0.0      1                            *00155000
10020702    900     0.03589    0.0      0.0      2                          *00155100
10020703    900     0.04833    0.0      0.0      3                          *00155200
10020704    900     0.11140    0.0      0.0      4                          *00155300
10020705    900     0.04833    0.0      0.0      5                          *00155400
10020706    900     0.03589    0.0      0.0      6                          *00155500
10020707    900     0.01918    0.0      0.0      7                          *00155600
10020801    0     0.0     0.0     0.0     7                                 *00155700
10020901    0   0.01306  0.01348  0.2350     3                             *00155800
10020902    0   0.01306  0.01348  0.4700     4                             *00155900
10020903    0   0.01306  0.01348  0.2350     7                             *00156000
*                                                                           *00156100
*************************************************************************** *00156200
*                                                                           *00156300
**********          HEAT STRUCTURES  ( VESSEL WALL )       ************** *00156400
*                                                                           *00156500
11000000    1   4   1   1   0.0                                             *00156600
11000100    0   1                                                           *00156700
11000101    3   0.21                                                        *00156800
*1000200    0                                                               *00156900
11000201    5   3                                                           *00157000
*1000300    0                                                               *00157100
11000301    0.0    3                                                        *00157200
11000400    0                                                               *00157300
11000401    560.0    4                                                      *00157400
11000501    080010000    0    1    0    0.5153    1                        *00157500
11000601    900010000    0    1    0    0.5153    1                        *00157600
11000701    0    0.0    0.0    0.0    1                                     *00157700
11000801    0    0.7    0.0    0.5    1                                     *00157800
11000901    0    0.7    0.0    0.5    1                                     *00157900
#                                                                           *00158000
11100000    3   4   2   1   0.35                                            *00158100
```

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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
11100100    0   1                                                           *00158200
11100101    3   0.405                                                       *00158300
*1100200    0                                                               *00158400
11100201    5   3                                                           *00158500
*1100300    0                                                               *00158600
11100301    0.0    3                                                        *00158700
11100400    0                                                               *00158800
11100401    560.0    4                                                      *00158900
11100501    080010000    0    1    1    0.348     1                       *00159000
11100502    070010000    0    1    1    0.2817    2                       *00159100
11100503    071010000    0    1    1    0.5503    3                       *00159200
11100601    900010000    0    1    1    0.348     1                       *00159300
11100602    900010000    0    1    1    0.2817    2                       *00159400
11100603    900010000    0    1    1    0.5503    3                       *00159500
11100701    0    0.0    0.0    0.0    3                                    *00159600
11100801    0    0.7    0.0    0.5    3                                    *00159700
11100901    0    0.81   0.0    0.5    3                                    *00159800
*                                                                           *00159900
11200000    1   4   2   1   0.3                                             *00160000
11200100    0   1                                                           *00160100
11200101    3   0.345                                                       *00160200
*1200200    0                                                               *00160300
11200201    5   3                                                           *00160400
*1200300    0                                                               *00160500
11200301    0.0    3                                                        *00160600
11200400    0                                                               *00160700
11200401    560.0    4                                                      *00160800
11200501    110010000    0    1    1    0.2371    1                       *00160900
11200601    900010000    0    1    1    0.2371    1                       *00161000
11200701    0    0.0    0.0    0.0    1                                    *00161100
11200801    0    0.6    0.0    0.5    1                                    *00161200
11200901    0    0.69   0.0    0.5    1                                    *00161300
*                                                                           *00161400
11300000    4   4   2   1   0.3                                             *00161500
11300100    0   1                                                           *00161600
11300101    3   0.340                                                       *00161700
*1300200    0                                                               *00161800
11300201    5   3                                                           *00161900
*1300300    0                                                               *00162000
11300301    0.0    3                                                        *00162100
11300400    0                                                               *00162200
11300401    560.0    4                                                      *00162300
11300501    111010000    0    1    1    0.328     1                       *00162400
11300502    112030000    0    1    1    0.35      2                       *00162500
11300503    112020000    0    1    1    0.356     3                       *00162600
11300504    112010000    0    1    1    0.189     4                       *00162700
11300601    900010000    0    1    1    0.328     1                       *00162800
11300602    900010000    0    1    1    0.35      2                       *00162900
11300603    900010000    0    1    1    0.356     3                       *00163000
11300604    900010000    0    1    1    0.189     4                       *00163100
11300701    0    0.0    0.0    0.0    4                                    *00163200
11300801    0    0.6    0.0    0.5    4                                    *00163300
11300901    0    0.68   0.0    0.5    4                                    *00163400
*                                                                           *00163500
11400000    7   4   2   1   0.246                                           *00163600
11400100    0   1                                                           *00163700
11400101    3   0.286                                                       *00163800
*1400200    0                                                               *00163900
11400201    5   3                                                           *00164000
```

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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*1400300    0                                                                *00164100
11400301    0.0   3                                                          *00164200
11400400    0                                                                *00164300
11400401    560.0   4                                                        *00164400
11400501    120010000   0   1   1   0.541    1                               *00164500
11400502    130040000   0   1   1   0.365    2                               *00164600
11400503    130030000   0   1   1   0.365    3                               *00164700
11400504    130020000   0   1   1   0.365    4                               *00164800
11400505    130010000   0   1   1   0.365    5                               *00164900
11400506    131010000   0   1   1   0.416    6                               *00165000
11400507    132010000   0   1   1   0.444    7                               *00165100
11400601    900010000   0   1   1   0.541    1                               *00165200
11400602    900010000   0   1   1   0.365    2                               *00165300
11400603    900010000   0   1   1   0.365    3                               *00165400
11400604    900010000   0   1   1   0.365    4                               *00165500
11400605    900010000   0   1   1   0.365    5                               *00165600
11400606    900010000   0   1   1   0.416    6                               *00165700
11400607    900010000   0   1   1   0.444    7                               *00165800
11400701    0   0.0   0.0   0.0   7                                          *00165900
11400801    0   0.492 0.0   0.5   7                                          *00166000
11400901    0   0.572 0.0   0.5   7                                          *00166100
*                                                                            *00166200
11500000    2  4  2  1  0.350                                                *00166300
11500100    0  1                                                            *00166400
11500101    3   0.505                                                        *00166500
*1500200    0                                                                *00166600
11500201    5  3                                                            *00166700
*1500300    0                                                                *00166800
11500301    0.0   3                                                          *00166900
11500400    0                                                                *00167000
11500401    560.0   4                                                        *00167100
11500501    010010000   0   1   1   0.12     1                               *00167200
11500502    011010000   0   1   1   0.135    2                               *00167300
11500601    900010000   0   1   1   0.12     1                               *00167400
11500602    900010000   0   1   1   0.135    2                               *00167500
11500701    0   0.0   0.0   0.0   2                                          *00167600
11500801    0   0.7   0.0   0.5   2                                          *00167700
11500901    0   1.01  0.0   0.5   2                                          *00167800
*                                                                            *00167900
11600000    1  4  1  1  0.0                                                  *00168000
11600100    0  1                                                            *00168100
11600101    3   0.180                                                        *00168200
*1600200    0                                                                *00168300
11600201    5  3                                                            *00168400
*1600300    0                                                                *00168500
11600301    0.0  3                                                         *00168600
11600400    0                                                                *00168700
11600401    560.0  4                                                       *00168800
11600501    900010000   0   1   0   0.801    1                               *00168900
11600601    011010000   0   1   0   0.801    1                               *00169000
11600701    0   0.0   0.0   0.0   1                                          *00169100
11600801    0   0.7   0.0   0.5   1                                          *00169200
11600901    0   0.7   0.0   0.5   1                                          *00169300
*                                                                            *00169400
*****************************************************************************00169500
*                                                                            *00169600
**********         HEAT STRUCTURE THERMAL PROPERTY DATA     ***************00169700
*                                                                            *00169800
*****************************************************************************00169900


                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*                                                                            *00170000
* INNER BN          TYPE        K-FLAG     CV-FLAG                         *00170100
20100100          TBL/FCTN        1          1                               *00170200
*                                                                            *00170300
* HEATER                                                                     *00170400
20100200          TBL/FCTN        1          1                               *00170500
*                                                                            *00170600
* OUTER BN                                                                   *00170700
20100300          TBL/FCTN        1          1                               *00170800
*                                                                            *00170900
* INCONEL600                                                                 *00171000
20100400          TBL/FCTN        1          1                               *00171100
*                                                                            *00171200
* SUS                                                                        *00171300
20100500          TBL/FCTN        1          1                               *00171400
*                                                                            *00171500
* MGO                                                                        *00171600
20100600          TBL/FCTN        1          1                               *00171700
*                                                                            *00171800
* LEAD                                                                       *00171900
20100700          TBL/FCTN        1          1                               *00172000
*                                                                            *00172100
**********   THERMAL CONDUCTIVITY   BTU/(S*FT*F)          ***************00172200
*                                                                            *00172300
* INNER BN   TEMP    COND       TEMP    COND       TEMP    COND             *00172400
20100101    293.15 29.7824     773.15 28.0379    973.15 27.1656             *00172500
20100102   1173.15 26.2933    1273.15 26.8541                               *00172600
*                                                                            *00172700
* HEATER                                                                     *00172800
20100201    293.15 17.5081     373.15 13.8320   2873.15 11.6513             *00172900
*                                                                            *00173000
* OUTER BN                                                                   *00173100
20100301            5.7945          * CONSTANT                             *00173200
*                                                                            *00173300
* INCONEL600                                                                 *00173400
20100401    294.26 14.8289     366.48 15.7012    477.59 17.5081             *00173500
20100402    588.71 19.1904     699.82 20.9350    810.93 22.8665             *00173600
20100403    922.04 24.7357    1033.15 26.8541   1144.26 28.9102             *00173700
*                                                                            *00173800
* SUS                                                                        *00173900
20100501    273.15 16.2620     773.15 20.9350                               *00174000
*                                                                            *00174100
* MGO                                                                        *00174200
20100601    293.15 26.4672     573.15 20.6234    673.15 17.1966             *00174300
20100602    773.15 14.0813     873.15 11.7136    973.15 10.0313             *00174400
20100603   1073.15  8.7852    1273.15  6.9160   1473.15  6.2930             *00174500
20100604   1506.48  6.7291    1873.15  7.3522                               *00174600
*                                                                            *00174700
* LEAD                                                                       *00174800
20100701            14.5798         * CONSTANT                             *00174900
*                                                                            *00175000
**********   VOLUMETRIC HEAT CAPACITY     BTU/(FT3*F)      ***************00175100
*                                                                            *00175200
* INNER BN   TEMP     CAP        TEMP     CAP        TEMP     CAP           *00175300
20100151    293.15  3.0716+5    783.15  4.0106+5    1123.15  5.0635+5       *00175400
20100152   1533.15  6.3512+5                                                *00175500
*                                                                            *00175600
* HEATER                                                                     *00175700
20100252    293.15  3.8496+6    373.15  3.7289+6    2873.15  3.8496+6       *00175800
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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*                                                                              *00175900
* OUTER SN                                                                     *00176000
20100351     293.15  3.0649+5   783.15  4.0173+5   1123.15  5.0702+5           *00176100
20100352    1533.15  6.3512+5                                                  *00176200
*                                                                              *00176300
* INCONEL600                                                                   *00176400
20100451     294.26  3.7355+6   366.48  3.9100+6    477.60  4.0843+6           *00176500
20100452     588.71  4.2654+6   699.82  4.4398+6    810.93  4.6477+6           *00176600
20100453     922.04  4.9294+6  1033.15  5.1104+6   1144.26  5.2513+6           *00176700
*                                                                              *00176800
* SUS                                                                          *00176900
20100551             3.9770+6          * CONSTANT                              *00177000
*                                                                              *00177100
* MGO                                                                          *00177200
20100651             3.3734+6          * CONSTANT                              *00177300
*                                                                              *00177400
*                                                                              *00177500
20100751             3.6417+6          * CONSTANT                              *00177600
*                                                                              *00177700
*******************************************************************************00177800
*******************************************************************************00177900
*                                                                              *00178000
**********  POWER  TRANSIENT DATA                                 ************00178100
*                                                                              *00178200
20290000    POWER                                                             *00178300
*             TIME       POWER                                               *00178400
*                                                                              *00178500
20290001       0.0       3.969+6 ***************************************      *00178600
20290002       8.8       3.969+6 *                                            *00178700
20290003      10.0       3.632+6 *                                            *00178800
20290004      14.0       2.707+6 *                                            *00178900
20290005      20.0       1.889+6 *                                            *00179000
20290006      24.0       1.536+6 *              COMMENT;                      *00179100
20290007      30.0       1.155+6 *                                            *00179200
20290008      40.0      0.9684+6 *        DATA FROM R926PST1                  *00179300
20290009      50.0      0.8136+6 *                                            *00179400
20290010      70.0      0.6668+6 *                                            *00179500
20290011     100.0      0.5517+6 *                                            *00179600
20290012     150.0      0.4485+6 *                                            *00179700
20290013     210.0      0.3374+6 *                                            *00179800
20290014     300.0      0.2739+6 *                                            *00179900
20290015     480.0      0.2300+6 *                                            *00180000
20290016     600.0      0.2342+6 *                                            *00180100
20290017    1800.0      0.1786+6 ***************************************      *00180200
*                                                                              *00180300
*******************************************************************************00180400
*                                                                              *00180500
*  CONTAINTMENT                                                                *00180600
*           NAME          TYPE                                                *00180700
2810000     C281          TMDPVOL                                             *00180800
*                                                                              *00180900
*          AREA  LEN   VOL    HZ   VR  ELV  ROU  HYD  FE                      *00181000
2810101   1.0+3  0.0  1.0+6  0.0  0.0  0.0  0.0  0.0  11                      *00181100
*                                                                              *00181200
*          CTL                                                                 *00181300
2810200     3                                                                 *00181400
*                                                                              *00181500
*          TIME      PRESSURE  TEMP                                          *00181600
2810201     0.0      0.0980+6  303.15      * CONSTANT                         *00181700
```

```
                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*                                                                              *00181800
*******************************************************************************00181900
*                                                                              *00182000
*  LPCI RESERVOIR          *  ENTHALPY CALCULATION                             *00182100
*                                                                              *00182200
*           NAME          TYPE                                                *00182300
3310000     C331          TMDPVOL                                             *00182400
*                                                                              *00182500
*          AREA  LEN   VOL    HZ   VR  ELV  ROU  HYD  FE                      *00182600
3310101   1.0+3  0.0  1.0+6  0.0  0.0  0.0  0.0  0.0  11                      *00182700
*                                                                              *00182800
*          CTL                                                                 *00182900
3310200     3                                                                 *00183000
*                                                                              *00183100
*          TIME     PRESSURE     TEMP                                        *00183200
3310201    0.0      2.47+6        313.0      * CONSTANT                       *00183300
*                                                                              *00183400
*******************************************************************************00183500
*                                                                              *00183600
*   LPCS RESERVOIR                    * ENTHALPY CALCULATION                   *00183700
*                                                                              *00183800
*           NAME          TYPE                                                *00183900
3320000     C332          TMDPVOL                                             *00184000
*                                                                              *00184100
*          AREA  LEN   VOL    HZ   VR  ELV  ROU  HYD  FE                      *00184200
3320101   1.0+3  0.0  1.0+6  0.0  0.0  0.0  0.0  0.0  11                      *00184300
*                                                                              *00184400
*          CTL                                                                 *00184500
3320200     3                                                                 *00184600
*                                                                              *00184700
*          TIME     PRESSURE     TEMP                                        *00184800
3320201    0.0     3.76+6        313.0      * CONSTANT                       *00184900
*                                                                              *00185000
*******************************************************************************00185100
*     JET PUMP SUCTION AT BROKEN LOOP                                          *00185200
*300000     C530      SNGLJUN                                                 *00185300
*300101     230010000  231000000  4.743-4  0.1    0.1    0000                *00185400
*300201     1      5.0      0.0      0.0                                      *00185500
*320000     C532      SNGLJUN                                                 *00185600
*320101     231010000  240000000  4.743-4  0.042  0.021  0000                *00185700
*320201     1      5.0      0.0      0.0                                      *00185800
*     JET PUMP SUCTION AT INTACT LOOP                                          *00185900
*330000     C533      SNGLJUN                                                 *00186000
*330101     170010000  171000000  4.743-4  0.1    0.1    0000                *00186100
*330201     1      5.0      0.0      0.0                                      *00186200
*340000     C534      SNGLJUN                                                 *00186300
*340101     171010000  180000000  4.743-4  0.042  0.021  0000                *00186400
*340201     1      5.0      0.0      0.0                                      *00186500
*******************************************************************************00186600
*                                                                              *00186700
******   FEED WATER LINE PIPING ( TRANSIENT FLASHING )                         *00186800
4000000     C400      SNGLVOL                                                 *00186900
*          AREA LEN     VOL       HZ     VR      ELV     ROUG      HYD  FE    *00187000
4000101    0.0  18.58 0.0357  0.0  -22.5  -7.11  0.00005  0.0  00            *00187100
4000200    3     7.2998+6    489.15    0.0                                    *00187200
*******************************************************************************00187300
*                                                                              *00187400
******   FEED WATER LINE JUNCTION ( FOR FLASHING )                             *00187500
4100000     C410      SNGLJUN                                                 *00187600
```

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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
4100101    400000000 111010000    1.924-3  2.47  1.88  0000                *00187700
4100201    1   0.0   0.0   0.0                                               *00187800
*                                                                            *00187900
******   HEAT SINK FOR HEAT LOSS   ***************************************  *00188000
*                                                                            *00188100
9000000    C900      TMDPVOL                                                 *00188200
9000101    1.+3  0.0  1.+6  0.0  90.0  10.0  0.0  0.0  11                    *00188300
9000200    3                                                                 *00188400
9000201    0.0     0.09804+4     303.15       * CONSTANT                     *00188500
*                                                                            *00188600
*****************************************************************************00188700
9100000    C91D      VALVE                                                   *00188800
9100101    080010000   900000000  1.0-3   0.0  0.0   0100      *           *00188900
9100201    1    0.0   0.0   0.0                        *                     *00189000
9100300    TRPVLV                                                            *00189100
9100301            527                                                       *00189200
*                                                                            *00189300
*****************************************************************************00189400
*****************************************************************************00189500
*  MINOR EDIT                                                                *00189600
*                                                                            *00189700
0000301  P         010010000                                                 *00189800
0000302  MFLOWJ    180010000                                                 *00189900
0000303  MFLOWJ    180020000                                                 *00190000
0000304  MFLOWJ    180030000                                                 *00190100
0000305  MFLOWJ    185010000                                                 *00190200
0000306  MFLOWJ    240010000                                                 *00190300
0000307  MFLOWJ    240020000                                                 *00190400
0000308  MFLOWJ    240030000                                                 *00190500
0000309  MFLOWJ    245010000                                                 *00190600
0000310  P         080010000                                                 *00190700
0000311  MFLOWJ    300000000                                                 *00190800
0000312  MFLOWJ    320000000                                                 *00190900
*0000313  MFLOWJ    302000000                                                *00191000
0000314  MFLOWJ    402000000                                                 *00191100
0000315  MFLOWJ    401000000                                                 *00191200
0000316  MFLOWJ    260000000                                                 *00191300
0000317  MFLOWJ    270000000                                                 *00191400
0000318  MFLOWJ    030010000                                                 *00191500
0000319  MFLOWJ    030020000                                                 *00191600
0000320  HTTEMP    001000109                                                 *00191700
0000321  HTTEMP    001000209                                                 *00191800
0000322  HTTEMP    001000309                                                 *00191900
0000323  HTTEMP    001000409                                                 *00192000
0000324  HTTEMP    001000509                                                 *00192100
0000325  HTTEMP    001000609                                                 *00192200
0000326  HTTEMP    001000709                                                 *00192300
0000327  MFLOWJ    050020000                                                 *00192400
0000328  VOIDGJ    030020000                                                 *00192500
0000329  VOIDG     040010000                                                 *00192600
0000330  VOIDG     040020000                                                 *00192700
0000331  VOIDG     040030000                                                 *00192800
0000332  VOIDG     040040000                                                 *00192900
0000333  VOIDG     040050000                                                 *00193000
0000334  VOIDG     040060000                                                 *00193100
0000335  VOIDG     040070000                                                 *00193200
0000336  VOIDGJ    050020000                                                 *00193300
0000337  MFLOWJ    031020000                                                 *00193400
0000338  HTTEMP    002000109                                                 *00193500
```

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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
0000339  HTTEMP    002000209                                                 *00193600
0000340  HTTEMP    002000309                                                 *00193700
0000341  HTTEMP    002000409                                                 *00193800
0000342  HTTEMP    002000509                                                 *00193900
0000343  HTTEMP    002000609                                                 *00194000
0000344  HTTEMP    002000709                                                 *00194100
0000345  MFLOWJ    050010000                                                 *00194200
0000346  VOIDGJ    031020000                                                 *00194300
0000347  VOIDG     045010000                                                 *00194400
0000348  VOIDG     045020000                                                 *00194500
0000349  VOIDG     045030000                                                 *00194600
0000350  VOIDG     045040000                                                 *00194700
0000351  VOIDG     045050000                                                 *00194800
0000352  VOIDG     045060000                                                 *00194900
0000353  VOIDG     045070000                                                 *00195000
0000354  VOIDGJ    050010000                                                 *00195100
0000355  VOIDG     100010000                                                 *00195200
0000356  VOIDG     100020000                                                 *00195300
0000357  VOIDG     100030000                                                 *00195400
0000358  VOIDG     090010000                                                 *00195500
0000359  VOIDG     090020000                                                 *00195600
0000360  VOIDG     090030000                                                 *00195700
0000361  VOIDG     060040000                                                 *00195800
0000362  VOIDG     060010000                                                 *00195900
0000363  VOIDG     051020000                                                 *00196000
0000364  VOIDG     050010000                                                 *00196100
0000365  VOIDG     030010000                                                 *00196200
0000366  VOIDG     020020000                                                 *00196300
0000367  VOIDG     020010000                                                 *00196400
0000368  VOIDG     010010000                                                 *00196500
0000369  VOIDG     080010000                                                 *00196600
0000370  VOIDG     070010000                                                 *00196700
0000371  VOIDG     071010000                                                 *00196800
0000372  VOIDG     110010000                                                 *00196900
0000373  VOIDG     110010000                                                 *00197000
0000374  VOIDG     111010000                                                 *00197100
0000375  VOIDG     112030000                                                 *00197200
0000376  VOIDG     112020000                                                 *00197300
0000377  VOIDG     112010000                                                 *00197400
0000378  VOIDG     120010000                                                 *00197500
0000379  VOIDG     130040000                                                 *00197600
0000380  VOIDG     130030000                                                 *00197700
0000381  VOIDG     130020000                                                 *00197800
0000382  VOIDG     130010000                                                 *00197900
0000383  VOIDG     131010000                                                 *00198000
0000384  MFLOWJ    010010000                                                 *00198100
0000385  MFLOWJ    010020000                                                 *00198200
0000386  MFLOWJ    010030000                                                 *00198300
0000387  MFLOWJ    010040000                                                 *00198400
0000388  MFLOWJ    010050000                                                 *00198500
0000389  MFLOWJ    030010000                                                 *00198600
0000390  MFLOWJ    030020000                                                 *00198700
0000391  MFLOWJ    030030000                                                 *00198800
0000392  MFLOWJ    031020000                                                 *00198900
0000393  MFLOWJ    050010000                                                 *00199000
0000394  MFLOWJ    050020000                                                 *00199100
0000395  MFLOWJ    050030000                                                 *00199200
0000396  MFLOWJ    050040000                                                 *00199300
0000397  VELFJ     050010000                                                 *00199400
```

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                GEM  V10L10  DATE 84.07.31  TIME 19.10.05  LIB=J2035.R926JP.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
0000398  VELGJ     050010000                                                *00199500
-                                                                          *00199600

HIGHEST SEVERITY CODE=00

STATISTICS: HIGHEST SEVERITY CODE=00
```

付録2C－2　インプットデータリスト（RUN926, Small Pump Model）

```
*************************************************************************00081500
*  INTACT JET PUMP SUCTION LINE                                          *00081600
1700000     C170       SNGLVOL                                           *00081700
1700101     0.003048  1.304  0.0  0.0  0.0  0.0  0.00005  0.0623  00     *00081800
1700200     3   7.29093+6   551.7   0.0                                  *00081900
*                                                                         *00082000
*************************************************************************00082100
*                                                                         *00082200
*   INTACT JET PUMP SUCTION    ....   SMALL PUMP ASSUMED                 *00082300
1710000     C171       PUMP                                              *00082400
1710101     0.0   0.973  0.002225  0.0  -90.0  -0.073  0                 *00082500
1710108     170010000   0.003048  0.6438 0.6438 0000                     *00082600
1710109     180000000   0.000474  0.042  0.021  0000                     *00082700
1710200     3   7.39435+6   551.7   0.0                                  *00082800
1710201     1    4.94   0.0   0.0                                        *00082900
1710202     1    4.94   0.0   0.0                                        *00083000
1710301     150  150  150 -1  -1  509  1                                 *00083100
1710302     376.99  0.85   0.01250  20.0   184.24  1.9  765.76           *00083200
1710303     0.0  0.0  0.0  0.0  0.0                                       *00083300
1710310     0.0  0.0  0.0                                               *00083400
*************************************************************************00084000
*                                                                         *00084100
*   INTACT JET PUMP                                                       *00084200
*                                                                         *00084300
1800000   C180    BRANCH                                                  *00084400
*                                                                         *00084500
1800001   2     1                                                         *00084600
*                                                                         *00084700
1800101  5.851-4  0.406 0.0  0.0  -90.0  -0.406  0.00005  0.0273  00     *00084800
*                                                                         *00084900
1800200  3   7.38813+6   551.7   0.0                                      *00085000
*                                                                         *00085100
1801101  160010000 180000000  1.108-4    0.936 0.510 0000                *00085200
1802101  180010000 185000000  5.851-4    0.07  0.01  0000                *00085300
*                                                                         *00085400
1801201   3.17   0.0  0.0                                                 *00085500
1802201   8.11   0.0  0.0                                                 *00085600
*                                                                         *00085700
*************************************************************************00109100
*                                                                         *00109200
*  BROKEN JET PUMP SUCTION LINE                                           *00109300
2300000    C230       SNGLVOL                                            *00109400
2300101    0.003048  1.304  0.0  0.0  0.0  0.0  0.00005  0.0623  00      *00109500
2300200    3   7.29093+6   551.7   0.0                                   *00109600
*                                                                         *00109700
*************************************************************************00109800
*                                                                         *00109900
*  BROKEN JET PUMP SUCTION   ....  SMALL PUMP ASSUMED                     *00110000
2310000    C231       PUMP                                               *00110100
2310101    0.0  0.973  0.002225  0.0  -90.0  -0.073  0                   *00110200
2310108    230010000   0.003048  0.6438 0.6438 0000                      *00110300
2310109    240000000    0.000474   0.042 0.021 0000                      *00110400
2310200    3    7.39435+6   551.7   0.0                                  *00110500
2310201    1     4.94    0.0    0.0                                      *00110600
2310202    1     4.94    0.0    0.0                                      *00110700
2310301    150   150   150  -1   -1   510   1                           *00110800
2310302    376.99  0.87   0.01250 20.0   184.24  1.9  765.76            *00110900
2310303    0.0   0.0   0.0   0.0   0.0                                   *00111000
2310310    0.0   0.0   0.0                                               *00111100
*************************************************************************00111700
*                                                                         *00111800
*   BROKEN JET PUMP                                                       *00111900
*                                                                         *00112000
2400000   C240    BRANCH                                                  *00112100
*                                                                         *00112200
2400001   2     1                                                         *00112300
*                                                                         *00112400
2400101  5.851-4   0.406  0.0  0.0  -90.0  -0.406  0.00005  0.0273  00  *00112500
*                                                                         *00112600
2400200  3    7.38813+6   551.7    0.0                                   *00112700
*                                                                         *00112800
2401101  220010000 240000000  1.108-4    0.936   0.510   0000           *00112900
2402101  240010000 245000000  5.851-4    0.07    0.01    0000           *00113000
*                                                                         *00113100
2401201   3.17    0.0     0.0                                            *00113200
2402201   8.11    0.0     0.0                                            *00113300
*                                                                         *00113400
```

付録2C－3　インプットデータリスト（RUN912，JAERI Jet Pump Model）

```
                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8

NO.1    MODULE NAME R912M106              BLOCKS    55

                LEVEL     12        DATE      84.05.09  TIME      18.58.30

              ***** APPOINTED MODULE INFORMATION *****

                LEVEL     12        DATE      84.07.31  TIME      15.52.37


=ROSA-III RUN912 POST-TEST ANALYSIS (Q6)                                    *00000100
*****************************************************************************00000200
*                                                                           *00000300
* RRRRRRRRR    DDDDDDDDD    SSSSSSSSS      AAAA         IIIIIIIIIIIIIIII *00000400
* RRRRRRRRR    DDDDDDDDDD   SSSSSSSSS      AAAA         IIIIIIIIIIIIIIII *00000500
* RR      RR   DD      DD   SS            AA  AA           II  II  II     *00000600
* RR      RR   DD      DD   SSS          AA    AA          II  II  II     *00000700
* RRRRRRRRR    DD      DD    SSSSSSSS    AA    AA          II  II  II     *00000800
* RRRRRRRRR    DD      DD     SSSSSSSS   AA    AA    ===   II  II  II     *00000900
* RR   RR      DD      DD           SS   AAAAAAAAAA  ===   II  II  II     *00001000
* RR   RR      DD      DD           SS   AAAAAAAAAA        II  II  II     *00001100
* RR    RR     DD      DD           SS   AA      AA        II  II  II     *00001200
* RR    RR     DD      DD           SS   AA      AA        II  II  II     *00001300
* RR     RR    DDDDDDDDDD   SSSSSSSSS   AA      AA    IIIIIIIIIIIIIIII *00001400
* RR     RR    DDDDDDDDD    SSSSSSSSS   AA      AA    IIIIIIIIIIIIIIII *00001500
*                                                                           *00001600
*****************************************************************************00001700
*                                                                           *00001800
*   BASE INPUT DATA              CREATED 1982/03/01                         *00001900
*           BASE INPUT J0797.R910PD02.DATA(RLP5MOA2)                        *00002000
*           BASE INPUT J9268.R5M1PA01.DATA(R5M1CA21)                        *00002100
*                              CREATED 1983/09/21                           *00002200
*           BASE INPUT J2035.ROSAJP2.DATA(R901JP4T)                         *00002300
*           BASE INPUT J2035.ROSAJP2.DATA(R926JP1T)                         *00002400
*           BASE INPUT J2035.ROSAJP2.DATA(R926JP3T)                         *00002500
*                                                                           *00002600
*RELAP5/MOD1 INPUT DATA                                                     *00002700
*                                                                           *00002800
*           TYPE         OPTION                                            *00002900
0000100     NEW          TRANSNT                                           *00003000
*                                                                           *00003100
*                INPUT CHECK                                                *00003200
0000101          RUN                                                        *00003300
*                                                                           *00003400
*            INPUT        OUTPUT                                          *00003500
0000102     SI           SI                                                *00003600
*                                                                           *00003700
*          T END     MIN       MAX     CON   MIE  MAE  MR                  *00003800
0000201     500.0    1.0-10    0.005    2    200   4000  4000              *00003900
*                                                                           *00004000
*                                                                           *00004100
0000502     TIME      0       GE      NULL     0       0.001       L   *BREAK *00004200
0000509     TIME      0       GE      NULL     0       0.001       L   *MRP1  *00004300
0000510     TIME      0       GE      NULL     0       0.001       L   *MRP2  *00004400
0000513     TIME      0       GT      NULL     0      -0.001       N   *QSV   *00004500
0000519     VOIDG 112030000 GT      NULL     0       0.75        L   *L1    *00004600
0000526     TIME      0       GE      NULL     0       0.001       L *BREAK V *00004700
0000527     TIME      0       GE      NULL     0    1000.0         L *BREAK P *00004800


                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
0000530     VOIDG 071010000 LT      NULL     0       0.75        N   *L2    *00004900
0000531     P     080010000 GT      NULL     0    8.34+6         N *SRV     *00005000
*                                                                           *00005100
*****************************************************************************00005200
*****************************************************************************00005300
*                                                                           *00005400
**********          HYDRODYNAMIC COMPONENTS             ******************00005500
*                                                                           *00005600
*     REFERENCES                                                            *00005700
*       1. JAERI-M 8588   RELAP4J INPUT DATA FOR ROSA-III RUN 704           *00005800
*       2. JAERI-M 8499   PIPING ETC                                        *00005900
*       3. MECHANICAL ENGINEERING HANDBOOK                                  *00006000
*       4. RELAP5 USERS MANUAL VOL 1,2,3                                    *00006100
*       5. LOFT INPUT DATA FOR RELAP5 CALCULATION                           *00006200
*                                                                           *00006300
*     FUNDAMENTAL ASSUMPTION                                                *00006400
*         NONHOMOGENEOUS, NONEQUILIBRIUM ..... INSIDE VESSEL                *00006500
*                                                                           *00006600
*     NOTE                                                                  *00006700
*       ALL BEND RESISTANCES ARE CALCULATED FROM REFERENCE 3                *00006800
*       ALL WALL ROUGHNESS ARE CONSTANT                                     *00006900
*           E = 0.00005  (M)                                               **00007000
*                                                                           *00007100
*****************************************************************************00007200
*                                                                           *00007300
*  LOWER PLENUM (1)                                                         *00007400
*                                                                           *00007500
*           NAME         TYPE                                              *00007600
0100000     C010         BRANCH                                            *00007700
*                                                                           *00007800
*           NO JUN       INITIAL C.C                                       *00007900
0100001      5            1                                                *00008000
*                                                                           *00008100
*         AREA  LEN     VOL       HZ    VR    ELV    ROUG      HYD  FE     *00008200
0100101   0.0   0.120  0.07959   0.0   90.0  0.120  0.00005   0.0  00      *00008300
*                                                                           *00008400
*          CTL     PRESSURE     TEMP     ZERO                              *00008500
0100200     3     7.35140+6     551.92   0.0                               *00008600
*                                                                           *00008700
*            FR         TO        AREA     F-LOSS R-LOSS CAHS             *00008800
0101101   010000000 011010000  0.0        0.0    0.0    0100              *00008900
0102101   185010000 010000000  0.0        1.0    0.432  0000              *00009000
0103101   245010000 010000000  0.0        1.0    0.432  0000              *00009100
0104101   010010000 020000000  0.0        0.0    0.0    0100              *00009200
0105101   010010000 090000000  1.758-4    1.55   1.55   0000              *00009300
*                                                                           *00009400
*          FLOW-F   FLOW-G    VELJ                                         *00009500
0101201   7.5391-4   0.0       0.0                                        *00009600
0102201    8.11      0.0       0.0                                        *00009700
0103201    8.11      0.0       0.0                                        *00009800
0104201   15.533     0.0       0.0                                        *00009900
0105201    0.71552   0.0       0.0                                        *00010000
*                                                                           *00010100
*****************************************************************************00010200
*                                                                           *00010300
0110000     C011         SNGLVOL                                           *00010400
0110101   0.3374  0.1350 0.0   0.0   90.0  0.1350 0.00005  0.0951  00      *00010500
*                                                                           *00010600
0110200    3     7.35230+6     551.61   0.0                               *00010700
```

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GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*                                                                              *00010800
********************************************************************************00010900
*                                                                              *00011000
*  LOWER PLENUM (2)                                                            *00011100
*                                                                              *00011200
*           NAME         TYPE                                                  *00011300
0200000     C020         PIPE                                                  *00011400
0200001   2                                                                    *00011500
0200101   0.07849     2                                                       *00011600
0200201   0.04366     1                                                       *00011700
0200301   0.2550      1                                                       *00011800
0200302   0.7819      2                                                       *00011900
0200401   0.0         2                                                       *00012000
0200501   0.0         2                                                       *00012100
0200601   90.0        2                                                       *00012200
0200701   0.2550      1                                                       *00012300
0200702   0.7819      2                                                       *00012400
0200801   0.00005    0.03714   2                                            *00012500
0200901   0.0     0.0       1                                                *00012600
0201001   00         2                                                       *00012700
0201101   0100       1                                                       *00012800
0201201   3     7.34980+6   551.85  0.0 0.0 1                               *00012900
0201202   3     7.34580+6   551.73  0.0 0.0 2                               *00013000
0201300   1                                                                  *00013100
0201301   15.536   0.0    0.0    1                                          *00013200
*                                                                              *00013300
********************************************************************************00013400
*                                                                              *00013500
*  CORE INLET CHAMBER          '          (VOLUME 3 .... RELAP4J)             *00013600
*                                                                              *00013700
*           NAME         TYPE                                                  *00013800
0300000     C030         BRANCH                                                *00013900
*                                                                              *00014000
*           NO JUN       INITIAL C.C                                           *00014100
0300001     3            1                                                     *00014200
*                                                                              *00014300
*          AREA   LEN   VOL    HZ   VR    ELV    ROUG     HYD      FE        *00014400
0300101   2.9355-2 0.3350  0.0  0.0  90.0  0.2300  0.00005  9.795-3 00        *00014500
*                                                                              *00014600
*          CTL   PRESSURE    TEMP    ZERO                                     *00014700
0300200    3     7.32760+6    551.70   0.0                                    *00014800
*                                                                              *00014900
*            FR         TO        AREA   F-LOSS R-LOSS CAHS                  *00015000
0301101   020010000 030000000  0.005352  10.94  10.94   0000                 *00015100
0302101   030010000 040000000  0.009498   0.0    0.0    0100                 *00015200
0303101   030010000 100000000  0.0003937  1.76   1.76   0000                 *00015300
*                                                                              *00015400
*          FLOW-F  FLOW-G   VELJ                                               *00015500
0301201    11.829   0.0      0.0                                              *00015600
0302201    11.348   0.0      0.0                                              *00015700
0303201     0.48079 0.0      0.0                                              *00015800
*                                                                              *00015900
0310000    C031    BRANCH                                                     *00016000
0310001    3       1                                                          *00016100
0310101    0.009785  0.335  0.0  0.0  90.0  0.23  0.00005  3.265-3  00      *00016200
0310200    3     7.32910+6     551.70    0.0                                  *00016300
0311101   020010000 031000000  0.001784 10.94 10.94  0000                   *00016400
0312101   031010000 045000000  0.003166  0.0   0.0   0100                   *00016500
0313101   031010000 100000000  1.312-4   1.76  1.76  0000                   *00016600


GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
0311201    3.7117  0.0  0.0                                                   *00016700
0312201    3.5124  0.0  0.0                                                   *00016800
0313201    0.19948 0.0  0.0                                                   *00016900
********************************************************************************00017000
*                                                                              *00017100
*  CORE                                        (VOLUME 32-37,4 .. RELAP4J)     *00017200
*     **** AVERAGE POWER CHANNEL                                               *00017300
*                                                                              *00017400
*           NAME         TYPE                                                  *00017500
0400000     C040         PIPE                                                  *00017600
*                                                                              *00017700
*           NO.VOL                                                             *00017800
0400001     7                                                                  *00017900
*                                                                              *00018000
*          AREA        VOL NO                                                  *00018100
0400101   0.02936        7                                                     *00018200
*                                                                              *00018300
*          AREA        JUN NO                                                  *00018400
0400201   0.0           6                                                     *00018500
*                                                                              *00018600
*          LEN         VOL NO                                                  *00018700
0400301   0.308          1                                                     *00018800
0400302   0.235          3                                                     *00018900
0400303   0.470          4                                                     *00019000
0400304   0.235          6                                                     *00019100
0400305   0.308          7                                                     *00019200
*                                                                              *00019300
*          VOL         VOL NO                                                  *00019400
0400401   0.0            7                                                     *00019500
*                                                                              *00019600
*          HZ          VOL NO                                                  *00019700
0400501   0.0            7                                                     *00019800
*                                                                              *00019900
*          VR          VOL NO                                                  *00020000
0400601   90.0           7                                                     *00020100
*                                                                              *00020200
*          ELV         VOL NO                                                  *00020300
0400701   0.308          1                                                     *00020400
0400702   0.235          3                                                     *00020500
0400703   0.470          4                                                     *00020600
0400704   0.235          6                                                     *00020700
0400705   0.308          7                                                     *00020800
*                                                                              *00020900
*          ROUGH        HYD   VOL NO                                           *00021000
0400801   0.00005    0.01306   7                                              *00021100
*                                                                              *00021200
*          F-LOSS    R-LOSS    JUN NO                                         *00021300
0400901    1.361     1.361      6                                             *00021400
*                                                                              *00021500
*          FE          VOL NO                                                  *00021600
0401001   00             7                                                     *00021700
*                                                                              *00021800
*          CAHS        JUN NO                                                  *00021900
0401101   0000           6                                                     *00022000
*                                                                              *00022100
*          CTL    PRESSURE     TEMP      ZERO       VOL                       *00022200
0401201    3     7.32390+6    554.44    0.0  0.0   1                         *00022300
0401202    3     7.32170+6    559.59    0.0  0.0   2                         *00022400
0401203    2     7.32000+6    9.9999-3  0.0  0.0   3                         *00022500
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                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
0401204     2     7.31790+6     0.033318  0.0  0.0  4                        *00022600
0401205     2     7.31580+6     0.048334  0.0  0.0  5                        *00022700
0401206     2     7.31430+6     0.046690  0.0  0.0  6                        *00022800
0401207     2     7.31280+6     0.063819  0.0  0.0  7                        *00022900
*         CTL                                                                *00023000
0401300     1                                                                *00023100
*                                                                            *00023200
*         FLOW-F  FLOW-G   VELJ    JUN NO                                   *00023300
0401301    11.349   0.0     0.0      1                                       *00023400
0401302    11.349   0.0     0.0      2                                       *00023500
0401303    11.1743  0.1787  0.0      3                                       *00023600
0401304    10.5235  0.8305  0.0      4                                       *00023700
0401305    10.2405  1.1139  0.0      5                                       *00023800
0401306    10.0308  1.3238  0.0      6                                       *00023900
*                                                                            *00024000
******************************************************************************00024100
*                                                                            *00024200
*  CORE                                                                      *00024300
*     **** HIGH POWER CHANNEL                                                *00024400
*                                                                            *00024500
0450000    C045      PIPE                                                    *00024600
0450001    7                                                                 *00024700
0450101    0.009785     7                                                    *00024800
0450201    0.0          6                                                    *00024900
0450301    0.308        1                                                    *00025000
0450302    0.235        3                                                    *00025100
0450303    0.470        4                                                    *00025200
0450304    0.235        6                          *                         *00025300
0450305    0.308        7                          *                         *00025400
0450401    0.0          7                                                    *00025500
0450501    0.0          7                                                    *00025600
0450601    90.0         7                                                    *00025700
0450701    0.308        1                                                    *00025800
0450702    0.235        3                                                    *00025900
0450703    0.470        4                                                    *00026000
0450704    0.235        6                          *                         *00026100
0450705    0.308        7                          *                         *00026200
0450801    0.00005   0.01306  7                                             *00026300
0450901    1.361  1.361  6                                                  *00026400
0451001    00           7                                                    *00026500
0451101    0000         6                                                    *00026600
0451201    3     7.32550+6     555.84    0.0  0.0  1                        *00026700
0451202    3     7.32330+6     562.01    0.0  0.0  2                        *00026800
0451203    2     7.32170+6     0.018923  0.0  0.0  3                        *00026900
0451204    2     7.32000+6     0.079437  0.0  0.0  4                        *00027000
0451205    2     7.31790+6     0.046495  0.0  0.0  5                        *00027100
0451206    2     7.31670+6     0.12919   0.0  0.0  6                        *00027200
0451207    2     7.31530+6     0.15183   0.0  0.0  7                        *00027300
0451300    1                                                                *00027400
0451301    3.5126  0.0    0.0    1                                          *00027500
0451302    3.5127  0.0    0.0    2                                          *00027600
0451303    3.3635  0.1495 0.0    3                                          *00027700
0451304    3.0592  0.4541 0.0    4                                          *00027800
0451305    2.9277  0.5857 0.0    5                                          *00027900
0451306    2.8298  0.6837 0.0    6                                          *00028000
*                                                                            *00028100
******************************************************************************00028200
*                                                                            *00028300
*  UPPER PLENUM                          (VOLUME 5 .... RELAP4J)             *00028400

                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*                                                                            *00028500
*         NAME        TYPE                                                   *00028600
0500000   C050        BRANCH                                                 *00028700
*                                                                            *00028800
*         NO JUN      INITIAL C.C                                            *00028900
0500001    4           1                                                     *00029000
*                                                                            *00029100
*        AREA  LEN   VOL    HZ   VR    ELV   ROUG    HYD   FE               *00029200
0500101  0.0  0.234 0.04137 0.0  90.0  0.234  0.00005  0.5  00               *00029300
*                                                                            *00029400
*        CTL   PRESSURE   QUALITY   ZERO                                     *00029500
0500200  2    7.30880+6   0.040595  0.0                                       *00029600
*                                                                            *00029700
*          FR        TO       AREA     F-LOSS R-LOSS  CAHS                  *00029800
0501101  045010000 050000000  0.003164    1.298  1.216  0000               *00029900
0502101  040010000 050000000  0.009492    1.298  1.216  0000               *00030000
0503101  100010000 050000000  0.01447     1.0    0.41   0000               *00030100
0504101  050010000 051000000  0.0         0.0    0.0    0000               *00030200
*                                                                            *00030300
*        FLOW-F   FLOW-G  VELJ                                               *00030400
0501201   2.7776   0.7361   0.0                                              *00030500
0502201   9.9164   1.4366   0.0                                              *00030600
0503201   1.3960   0.0      0.0                                              *00030700
0504201  14.1429   2.1221   0.0                                              *00030800
*                                                                            *00030900
0510000    C051      PIPE                          *                         *00031000
0510001    2                                       *                         *00031100
0510101    0.0  2                                  *                         *00031200
0510201    0.0  1                                  *                         *00031300
0510301    0.2345  2                               *                         *00031400
0510401    0.041365  2                             *                         *00031500
0510501    0.0  2                                  *                         *00031600
0510601    90.0  2                                 *                         *00031700
0510701    0.2345  2                               *                         *00031800
0510801    0.00005  0.5  2                         *                         *00031900
0510901    0.0  0.0  1                             *                         *00032000
0511001    00  2                                   *                         *00032100
0511101    0000  1                                 *                         *00032200
0511201    2  7.30770+6  0.024655 0.0 0.0  1       *                         *00032300
0511202    2  7.30660+6  0.032057 0.0 0.0  2       *                         *00032400
0511300    1                                       *                         *00032500
0511301    14.1432  2.1218  0.0  1                 *                         *00032600
*                                                  *                         *00032700
0520000    C052  SNGLJUN                           *                         *00032800
0520101    051010000 060000000  0.02165  0.407  0.792  0000*                *00032900
0520201    1  14.1343  2.1217  0.0                 *                         *00033000
******************************************************************************00033100
*                                                                            *00033200
*  STEAM SEPARATOR                                                           *00033300
0600000    C060   PIPE                             *                         *00033400
0600001    4                                       *                         *00033500
0600101    0.0  1                                  *                         *00033600
0600102    0.04101  3                              *                         *00033700
0600103    0.0  4                                  *                         *00033800
0600201    0.01387   1                             *                         *00033900
0600202    0.0       2                             *                         *00034000
0600203    0.017789  3                             *                         *00034100
0600301    0.335  1                                *                         *00034200
0600302    0.2497  3                               *                         *00034300
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                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
0600303     0.288  4                                  *                      *00034400
0600401     0.006416  1                               *                      *00034500
0600402     0.0  3                                    *                      *00034600
0600403     0.005564  4                               *                      *00034700
0600501     0.0  4                                    *                      *00034800
0600601     90.0  4                                   *                      *00034900
0600701     0.335  1                                  *                      *00035000
0600702     0.2497  3                                 *                      *00035100
0600703     0.288  4                                  *                      *00035200
0600801     0.00005  0.15616  1                       *                      *00035300
0600802     0.00005  0.22312  3                       *                      *00035400
0600803     0.00005  0.1585   4                       *                      *00035500
0600901     0.0  0.0  3                               *                      *00035600
0601001     00  4                                     *                      *00035700
0601101     0100  3                                   *                      *00035800
0601201     2  7.30430+6  0.075649 0.0 0.0  1         *                      *00035900
0601202     2  7.30380+6  0.022138 0.0 0.0  2         *                      *00036000
0601203     2  7.30290+6  0.11744  0.0 0.0  3         *                      *00036100
0601204     2  7.30000+6  0.037099 0.0 0.0  4         *                      *00036200
0601300     1                                         *                      *00036300
0601301     14.1375  2.1225  0.0  1                   *                      *00036400
0601302     14.1342  2.1278  0.0  2                   *                      *00036500
0601303     14.1276  2.1234  0.0  3                   *                      *00036600
*                                                                            *00036700
*****************************************************************************00036800
*                                                                            *00036900
*  UPPER DOWNCOMER                                                           *00037000
*                                                                            *00037100
*          NAME        TYPE                                                  *00037200
0710000     C071        BRANCH                                                *00037300
0710001   3  1                                                               *00037400
0710101   0.0   0.5503  0.1891  0.0  90.0  0.5503  0.00005  0.6615 00       *00037500
0710200   2  7.29770+6  0.15944  0.0                                          *00037600
0711101   060010000  071010000  0.0       0.0  0.0  0000                   *00037700
0712101   071010000  070000000  0.0       0.0  0.0  0000                   *00037800
0713101   071000000  110010000  0.2316    0.0  0.0  0100                   *00037900
0711201   14.1360  2.1240   0.0                                             *00038000
0712201   0.0      2.1198   0.0                                             *00038100
0713201   13.8895   0.01351 0.0                                             *00038200
*                                                                            *00038300
*****************************************************************************00038400
*                                                                            *00038500
*  UPPER HEAD (ABOVE SEPARATOR)                                              *00038600
*                                                                            *00038700
0700000   C070         SNGLVOL                                               *00038800
0700101   0.38485  0.2817  0.0  0.0  90.0  0.2817  0.00005  0.7     00      *00038900
0700200   2     7.29780+6  0.99973  0.0                                      *00039000
*                                                                            *00039100
*****************************************************************************00039200
*                                                                            *00039300
0720000     C072        SNGLJUN                                               *00039400
0720101     070010000  080000000  0.01914  0.0  0.0  0100                   *00039500
0720201     1  0.0  2.1186  0.0                                              *00039600
*                                                                            *00039700
*****************************************************************************00039800
*                                                                            *00039900
*  STEAM DOME                              (VOLUME 8 .... RELAP4J)           *00040000
*                                                                            *00040100
*          NAME        TYPE                                                  *00040200


                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
0800000     C080        SNGLVOL                                               *00040300
*                                                                            *00040400
*          AREA  LEN     VOL        HZ   VR    ELV    ROUG     HYD  FE      *00040500
0800101    0.0   0.348   0.126748  0.0  90.0  0.348  0.00005  0.7  00      *00040600
*                                                                            *00040700
*          CTL   PRESSURE    QUALITY   ZERO                                  *00040800
0800200     2    7.29730+6   0.99317    0.0                                  *00040900
*                                                                            *00041000
*****************************************************************************00041100
*                                                                            *00041200
*  GUIDE TUBE                              (VOLUME 9 .... RELAP4J)           *00041300
*                                                                            *00041400
*          NAME        TYPE                                                  *00041500
0900000     C090        PIPE                                                  *00041600
0900001     3                                                                 *00041700
0900101   0.0     2                                                          *00041800
0900102   0.02515  3                                                         *00041900
0900201   0.0     1                                                          *00042000
0900202   0.00193  2                                                         *00042100
0900301   0.5529   1                                                         *00042200
0900302   0.554    2                                                         *00042300
0900303   0.16  3                                                           *00042400
0900401   0.036298  1                                                       *00042500
0900402   0.028296  2                                                       *00042600
0900403   0.0  3                                                           *00042700
0900501   0.0      3                                                        *00042800
0900601   90.0     3                                                        *00042900
0900701   0.5529   1                                                        *00043000
0900702   0.554    2                                                        *00043100
0900703   0.16  3                                                           *00043200
0900801   0.00005 0.05567   2                                               *00043300
0900802   0.00005 0.02284   3                                               *00043400
0900901   0.0     0.0       2                                               *00043500
0901001   00        3                                                       *00043600
0901101   0000      1                                                       *00043700
0901102   0100      2                                                       *00043800
0901201   3     7.33180+6   551.70   0.0  0.0  1                          *00043900
0901202   3     7.32770+6   551.69   0.0  0.0  2                          *00044000
0901203   3     7.32490+6   551.69   0.0  0.0  3                          *00044100
0901300    1                                                               *00044200
0901301   0.71587 0.0       0.0      1                                     *00044300
0901302   0.71584 0.0       0.0      2                                     *00044400
*                                                                            *00044500
*****************************************************************************00044600
*                                                                            *00044700
0950000     C095    SNGLJUN                                                 *00044800
0950101     090010000 100000000  0.00193  0.0    0.0    0100               *00044900
0950201     1     0.71583 0.0    0.0                                        *00045000
*                                                                            *00045100
*****************************************************************************00045200
*                                                                            *00045300
*  CORE BYPASS                             (VOLUME10 .... RELAP4J)           *00045400
*                                                                            *00045500
*          NAME        TYPE                                                  *00045600
1000000     C100        PIPE                                                  *00045700
1000001   3                                                                 *00045800
1000101   0.02515    3                                                      *00045900
1000201   0.0        2                                                      *00046000
1000301   0.676      1                                                      *00046100
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                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
1000302    0.675       2                                                        *00046200
1000303    0.675       3                                                        *00046300
1000401    0.0         3                                                        *00046400
1000501    0.0         3                                                        *00046500
1000601    90.0        3                                                        *00046600
1000701    0.676       1                                                        *00046700
1000702    0.675       2                                                        *00046800
1000703    0.675       3                                                        *00046900
1000801    0.00005 0.02284   3                                                 *00047000
1000901    0.0       0.0       2                                              *00047100
1001001    00          3                                                        *00047200
1001101    0000        2                                                        *00047300
1001201    3      7.32180+6   551.69    0.0  0.0  1                           *00047400
1001202    3      7.31680+6   551.69    0.0  0.0  2                           *00047500
1001203    3      7.31180+6   551.69    0.0  0.0  3                           *00047600
1001300    1                                                                   *00047700
1001301    1.3961    0.0      0.0      2                                       *00047800
*                                                                              *00047900
*******************************************************************************00048000
*                                                                              *00048100
*  UPPER DOWNCOMER-1                        (VOLUME27 .... RELAP4J)           *00048200
*                                                                              *00048300
*            NAME          TYPE                                              *00048400
1100000     C110          SNGLVOL                                             *00048500
1100101   0.0  0.2371  0.05588  0.0  90.0  0.2371  0.00005  0.5478  00        *00048600
1100200   2   7.29860+6    0.27676 0.0                                        *00048700
*******************************************************************************00048800
*                                                                              *00048900
*  UPPER DOWNCOMER        (FEEDWATER SPAGER)                                   *00049000
*                                                                              *00049100
*            NAME          TYPE                                              *00049200
1110000     C111          BRANCH                                              *00049300
*                                                                              *00049400
1110001   2         1                                                          *00049500
1110101   0.0  0.328  0.081672  0.0  90.0  0.328  0.00005  0.56306  00        *00049600
1110200   3     7.29980+6  552.98  0.0                                        *00049700
1111101   110000000 111010000  0.0       0.0    0.0   0000                   *00049800
1112101   111000000 112010000  0.08006   0.0    0.0   0000                   *00049900
1111201     14.113  0.0     0.0                                               *00050000
1112201     16.228  0.0     0.0                                               *00050100
*******************************************************************************00050200
*                                                                              *00050300
1120000     C112          PIPE                                                *00050400
1120001     3                                                                 *00050500
1120101     0.0           1                                                   *00050600
1120102     0.08006       2                                                   *00050700
1120103     0.08006       3                                                   *00050800
1120201     0.0           2                                                   *00050900
1120301     0.189         1                                                   *00051000
1120302     0.356         2                                                   *00051100
1120303     0.35          3                                                   *00051200
1120401     0.013658      1                                                   *00051300
1120402     0.0           3                                                   *00051400
1120501     0.0           3                                                   *00051500
1120601     90.0          3                                                   *00051600
1120701     0.189         1                                                   *00051700
1120702     0.356         2                                                   *00051800
1120703     0.35          3                                                   *00051900
1120801     0.00005 0.303     1                                               *00052000

                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
1120802     0.00005 0.092     3                                               *00052100
1120901     0.0     0.0       2                                               *00052200
1121001     00          3                                                     *00052300
1121101     0000        2                                                     *00052400
1121201     3      7.30730+6   552.80    0.0  0.0   1                        *00052500
1121202     3      7.30530+6   552.85    0.0  0.0   2                        *00052600
1121203     3      7.30270+6   552.92    0.0  0.0   3                        *00052700
1121300     1                                                                 *00052800
1121301   -16.232   0.0     0.0     1                                         *00052900
1121302   -16.230   0.0     0.0     2                                         *00053000
*******************************************************************************00053100
*                                                                              *00053200
*  LOWER DOWNCOMER (JET PUMP INLET)     (VOLUME11 .... RELAP4J)               *00053300
*                                                                              *00053400
*            NAME          TYPE                                              *00053500
1200000     C120          BRANCH                                              *00053600
*                                                                              *00053700
*            NO JUN        INITIAL C.C                                       *00053800
1200001      4             1                                                  *00053900
*                                                                              *00054000
*          AREA      LEN     VOL  HZ   VR    ELV    ROUG     HYD     FE      *00054100
1200101   0.022478  0.541  0.0  0.0  90.0  0.541  0.00005  0.030   00        *00054200
*                                                                              *00054300
*          CTL   PRESSURE     TEMP      ZERO                                  *00054400
1200200   3     7.30950+6    552.78    0.0                                   *00054500
*                                                                              *00054600
*            FR          TO        AREA    F-LOSS R-LOSS CAHS                *00054700
1201101   112000000 120010000  0.0      0.0      0.0      0100               *00054800
1202101   120000000 130010000  0.0      0.0      0.0      0000               *00054900
1203101   120000000 170000000  0.0      0.55     1.0      0000               *00055000
1204101   120000000 230000000  0.0      0.55     1.0      0000               *00055100
*                                                                              *00055200
*          FLOW-F    FLOW-G  VELJ                                            *00055300
1201201   16.233     0.0       0.0                                           *00055400
1202201    6.34      0.0       0.0                                           *00055500
1203201    4.94      0.0       0.0                                           *00055600
1204201    4.94    0.0       0.0                                             **00055700
*                                                                              *00055800
*******************************************************************************00055900
*                                                                              *00056000
*  LOWER DOWNCOMER                      (VOLUME11 .... RELAP4J)               *00056100
*                                                                              *00056200
*            NAME          TYPE                                              *00056300
1300000     C130          PIPE                                                *00056400
1300001   4                                                                   *00056500
1300101   0.0           1                                                     *00056600
1300102   0.022478      4                                                     *00056700
1300201   0.0           3                                                     *00056800
1300301   0.365         4                                                     *00056900
1300401   0.014181      1                                                     *00057000
1300402   0.0           4                                                     *00057100
1300501   0.0           4                                                     *00057200
1300601   90.0          4                                                     *00057300
1300701   0.365         4                                                     *00057400
1300801   0.00005  0.070333 1                                                *00057500
1300802   0.00005  0.030    4                                                *00057600
1300901   0.0      0.0      3                                                *00057700
1301001   00          4                                                      *00057800
1301101   0000      3                                                        *00057900
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                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
1301201    3        7.32120+6     552.03    0.0  0.0    1                    *00058000
1301202    3        7.31840+6     552.28    0.0  0.0    2                    *00058100
1301203    3        7.31580+6     552.44    0.0  0.0    3                    *00058200
1301204    3        7.31310+6     552.59    0.0  0.0    4                    *00058300
1301300    1                                                                  *00058400
1301301    -6.34     0.0        0.0        1                                  *00058500
1301302    -6.34     0.0        0.0        2                                  *00058600
1301303    -6.34     0.0        0.0        3                                  *00058700
*************************************************************************** *00058800
*  RECIRCULATION INLET PIPE TEE                                              *00058900
1310000    C131     BRANCH                                                    *00059000
1310001    4              1                                                   *00059100
1310101    0.019563  0.416  0.0  0.0  90.0  0.416  0.00005  0.026  00       *00059200
1310200    3      7.32360+6    551.88    0.0                                 *00059300
1311101    130000000 131010000 0.009161 0.0     0.0     0100                *00059400
1312101    131000000 140000000    0.0     0.75    1.0     0000              *00059500
1313101    131000000 190000000    0.0     0.75    1.0     0000              *00059600
1314101    131000000 132010000    0.0     0.0     0.0     0000              *00059700
1311201     6.34      0.0        0.0                                         *00059800
1312201     3.17      0.0        0.0                                         *00059900
1313201     3.17      0.0        0.0                                         *00060000
1314201    4.1570-4  0.0        0.0                                         *00060100
*************************************************************************** *00060200
*   DEAD ZONE UNDER RECIRCULATION INLET PIPE                                 *00060300
1320000    C132     SNGLVOL                                                   *00060400
1320101    0.019563  0.444  0.0  0.0  90.0  0.444  0.00005  0.026  00       *00060500
1320200    3      7.32690+6    551.42    0.0                                 *00060600
*                                                                            *00060700
*************************************************************************** *00060800
*                                                                            *00060900
*  INTACT RECIRCULATION INLET LINE      (VOLUME23 .... RELAP4J)              *00061000
1400000     C140         PIPE                                                *00061100
1400001     3                                                                *00061200
1400101    0.0019244         3                                               *00061300
1400201    0.0               2                                               *00061400
1400301    2.0445            1                                               *00061500
1400302    1.9894            2                                               *00061600
1400303    1.7939            3                                               *00061700
1400401    0.0               3                                               *00061800
1400501    0.0               3                                               *00061900
1400601    -90.0             3                                               *00062000
1400701    -0.154            1                                               *00062100
1400702    -1.704            2                                               *00062200
1400703    -1.315            3                                               *00062300
1400801    0.00005  0.0495    3                                              *00062400
1400901    0.25     0.25     1                                              *00062500
1400902    0.19     0.19     2                                              *00062600
1401001    00               3                                               *00062700
1401101    0000             2                                               *00062800
1401201    3      7.32250+6    551.80    0.0  0.0    1                    *00062900
1401202    3      7.32770+6    551.73    0.0  0.0    2                    *00063000
1401203    3      7.33740+6    551.69    0.0  0.0    3                    *00063100
1401300    1                                                                *00063200
1401301    3.17      0.0        0.0        1                                *00063300
1401302    3.17      0.0        0.0        2                                *00063400
*************************************************************************** *00063500
*                                                                            *00063600
*  INTACT RECIRCULATION PUMP            (VOLUME24 .... RELAP4J)            *00063700
*                                                                            *00063800
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                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*          NAME         TYPE                                                *00063900
1500000     C150         PUMP                                                *00064000
*                                                                            *00064100
*         AREA    LEN    VOL    HZ     VR      ELV  CTL                     *00064200
1500101   0.0    0.26   0.005295   0.0    -90.0    -0.26   0                 *00064300
*                                                                            *00064400
*          VOL NO     AREA    F-LOSS R-LOSS  CAHS                          *00064500
1500108   140010000  0.0019244    0.00  0.00  0000                          *00064600
*                                                                            *00064700
*          VOL NO     AREA    F-LOSS R-LOSS  CAHS                          *00064800
1500109   160000000  0.0002746    0.1   0.1   0000                          *00064900
*                                                                            *00065000
*          CTL     PRESSURE      TEMP        ZERO                          *00065100
1500200     3      7.58870+6     552.06     0.0                            *00065200
*                                                                            *00065300
*          CTL     FLOW-F  FLOW-G   VEL                                     *00065400
1500201     1      3.17     0.0      0.0                                     *00065500
*                                                                            *00065600
*          CTL     FLOW-F  FLOW-G   VEL                                     *00065700
1500202     1      3.17     0.0      0.0                                     *00065800
*                                                                            *00065900
*         TAB-D  TWO-P  DIF-T  MOTOR   TAB-S  TRIP   REVER                   *00066000
1500301     0       0       0      -1     -1     509     1                  *00066100
*                                                                            *00066200
*          R-SP    I/R     R-FL    R-HD    R-TOR M-IN  R-DEN                *00066300
1500302   376.99  0.575    0.0075 262.0 184.2 0.475 1000.0                  *00066400
*                                                                            *00066500
*         R-M-TR    FR-TF2     FR-TF0     FR-TF1     FR-TF3                 *00066600
1500303     0.0        7.56      0.001       0.0        42.7                *00066700
*                                                                            *00066800
*         ELS TM  MX-F     MX-R                                            *00066900
1500310   0.0      0.0      0.0                                             *00067000
*                                                                            *00067100
* SINGLE PHASE 4 QUADRANT HEAD TABLES                                        *00067200
*                                                                            *00067300
1501100 1  1                                                                *00067400
1501101  0.00  0.92  0.20  0.94  0.40  0.97  0.60  1.00  1.00  1.00          *00067500
1501200 1  2                                                                *00067600
1501201  0.00 -0.20  0.25  0.00  0.40  0.12  0.70  0.50  1.00  1.00          *00067700
1501300 1  3                                                                *00067800
1501301 -1.00  1.20 -0.80  0.98 -0.60  0.94 -0.30  0.92  0.00  0.92          *00067900
1501400 1  4                                                                *00068000
1501401 -1.00  1.20 -0.80  0.70 -0.50  0.34 -0.20  0.18  0.00  0.18          *00068100
1501500 1  5                                                                *00068200
1501501  0.00  0.62  0.20  0.69  0.40  0.77  0.60  0.85  1.00  1.00          *00068300
1501600 1  6                                                                *00068400
1501601  0.00  0.18  0.20  0.22  0.40  0.32  0.65  0.52  1.00  1.00          *00068500
1501700 1  7                                                                *00068600
1501701 -1.00  0.00 -0.80  0.16 -0.40  0.45 -0.20  0.56  0.00  0.62          *00068700
1501800 1  8                                                                *00068800
1501801 -1.00  0.00 -0.80 -0.14 -0.50 -0.24 -0.20 -0.24  0.00 -0.20          *00068900
*                                                                            *00069000
* SINGLE PHASE 4 QUADRANT TORQUE TABLES                                      *00069100
*                                                                            *00069200
1501900 2  1                                                                *00069300
1501901  0.00  0.69              0.50              0.84  1.00  1.00          *00069400
1502000 2  2                                                                *00069500
1502001  0.00 -0.03  0.10  0.01  0.30  0.13  0.80  0.71  1.00  1.00          *00069600
1502100 2  3                                                                *00069700
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                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
1502101 -1.00  0.76 -0.60  0.44 -0.40  0.44                0.00  0.69
1502200 2  4
1502201 -1.00  0.76 -0.70  0.39 -0.20  0.10                0.00  0.10
1502300 2  5
1502301  0.00 -0.72  0.54 -0.69  0.70 -0.58  0.90 -0.48  1.00 -0.33
1502400 2  6
1502401  0.00  0.10  0.10  0.10  0.44  0.18  0.70 -0.10  1.00 -0.33
1502500 2  7
1502501 -1.00 -1.23 -0.92 -0.82 -0.66 -0.90 -0.26 -0.72  0.00 -0.72
1502600 2  8
1502601 -1.00 -1.23 -0.90 -0.95 -0.70 -0.60 -0.24 -0.10  0.00 -0.03
*
* 2-PHASE MULTIPLIER TABLES
*
1503000 0
1503001  0.0  0.0  0.1  0.0  0.15  0.05  0.24  0.8  0.3  0.96
1503002  0.4  0.98 0.6  0.97 0.80  0.90  0.90  0.8  0.96 0.50
1503003  1.0  1.0
1503100 0
1503101  0.0  0.0  0.125 0.07 0.165 0.125 0.24 0.56 0.80 0.56
1503102  0.96 0.45 1.0   0.0
*
* 2-PHASE HEAD DIFFERENCE TABLES          * BUILT-IN RELAP4J
*
1504100 1  1
1504101  0.00  0.00  0.10  0.67  0.25  0.91  0.50  1.12
1504102  0.75  1.28  1.00  1.34
1504200 1  2
1504201  0.00  0.31  0.25  0.42  0.50  0.57  0.75  0.97  1.00  1.34
1504300 1  3
1504301 -1.00 -1.18 -0.75 -1.30 -0.50 -1.08 -0.25 -0.93
1504302 -0.10 -0.71  0.00  0.00
1504400 1  4
1504401 -1.00 -1.18 -0.75 -0.24 -0.50 -0.07 -0.25 -0.08  0.00 -0.19
1504500 1  5
1504501  0.00  0.00  0.10 -0.39  0.25 -0.71  0.50 -0.71
1504502  0.75 -0.58  1.00 -0.47
1504600 1  6
1504601  0.00 -0.19  0.25 -0.45  0.50 -0.55  0.75 -0.59  1.00 -0.47
1504700 1  7
1504701 -1.00  0.51 -0.75  0.55 -0.50  0.51 -0.25  0.39  0.00  0.00
1504800 1  8
1504801 -1.00  0.51 -0.75  0.31 -0.50  0.22 -0.25  0.21  0.00  0.31
*
* 2-PHASE TORQUE DIFFERENCE TABLES        * BUILT-IN RELAP4J
*
1504900 2  1
1504901  0.00  0.00  0.10  0.67  0.25  0.91  0.50  1.12
1504902  0.75  1.28  1.00  1.34
1505000 2  2
1505001  0.00  0.31  0.25  0.42  0.50  0.57  0.75  0.97  1.00  1.34
1505100 2  3
1505101 -1.00 -1.18 -0.75 -1.30 -0.50 -1.08 -0.25 -0.93
1505102 -0.10 -0.71  0.00  0.00
1505200 2  4
1505201 -1.00 -1.18 -0.75 -0.24 -0.50 -0.07 -0.25 -0.08  0.00 -0.19
1505300 2  5
1505301  0.00  0.00  0.10 -0.39  0.25 -0.71  0.50 -0.71
1505302  0.75 -0.58  1.00 -0.47

                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
1505400 2  6
1505401  0.00 -0.19  0.25 -0.45  0.50 -0.55  0.75 -0.59  1.00 -0.47
1505500 2  7
1505501 -1.00  0.51 -0.75  0.55 -0.50  0.51 -0.25  0.39  0.00  0.00
1505600 2  8
1505601 -1.00  0.51 -0.75  0.31 -0.50  0.22 -0.25  0.21  0.00  0.31
*
*
**************************************************************************
*
* INTACT RECIRCULATION OUTLET LINE     (VOLUME25,26 .... RELAP4J)
*
*          NAME         TYPE
1600000    C160         PIPE
*
1600001    6
1600101    0.0019244      5
1600102    0.0            6
1600201    0.0            4
1600202    0.0023162      5
1600301    2.425          1
1600302    2.5762         2
1600303    3.125          3
1600304    2.221          4
1600305    1.780          5
1600306    0.859          6
1600401    0.0            5
1600402    0.001776       6
1600501    0.0            6
1600601    90.0           1
1600602    0.0            2
1600603    90.0           5
1600604    -90.0          6
1600701    1.275          1
1600702    0.0            2
1600703    2.830          3
1600704    0.50           4
1600705    1.190          5
1600706   -0.559          6
1600801    0.00005 0.0495    5
1600802    0.00005 0.0513    6
1600901    0.295     0.295     1
1600902   13.903    13.903     2
1600903    0.085     0.085     3
1600904    0.112     0.112     4
1600905    0.336     0.336     5
1601001    00             6
1601101    0000           4
1601102    0000           5
1601201    3    7.82780+6   552.14   0.0  0.0   1
1601202    3    7.82110+6   552.13   0.0  0.0   2
1601203    3    7.78740+6   552.11   0.0  0.0   3
1601204    3    7.77330+6   552.09   0.0  0.0   4
1601205    3    7.76580+6   552.03   0.0  0.0   5
1601206    3    7.76290+6   552.10   0.0  0.0   6
1601300    1
1601301    3.17      0.0      0.0      1
1601302    3.17      0.0      0.0      2
1601303    3.17      0.0      0.0      3
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                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
1601304    3.17      0.0      0.0      4                                        *00081600
1601305    3.17      0.0      0.0      5                                        *00081700
*                                                                              *00081800
*********************************************************************************00081900
*  INTACT JET PUMP SUCTION LINE                                                *00082000
*700000      C170          SNGLVOL                                             *00082100
*700101      0.003048  1.304  0.0  0.0  0.0  0.0  0.00005  0.0623  00          *00082200
*700200      3  7.29093+6    551.7    0.0                                      *00082300
*                                                                              *00082400
*********************************************************************************00082500
*                                                                              *00082600
*    INTACT JET PUMP SUCTION     ....    SMALL PUMP ASSUMED                    *00082700
*710000      C171        PUMP                                                  *00082800
*710101      0.0   0.973  0.002225  0.0  -90.0  -0.073  0                      *00082900
*710108      170010000    0.003048  0.6438 0.6438 0000                         *00083000
*710109      180000000    0.000474  0.042  0.021  0000                         *00083100
*710200      3    7.39435+6    551.7    0.0                                   *00083200
*710201      1     5.00    0.0    0.0                                         *00083300
*710202      1     5.00    0.0    0.0                                         *00083400
*710301      150  150  150 -1  -1  509  1                                      *00083500
*710302      376.99  0.5092 0.01250  20.0    184.24  1.9  765.76              *00083600
*710303      0.0  0.0  0.0  0.0  0.0                                           *00083700
*710310      0.0  0.0  0.0                                                    *00083800
*                                ....    NAIG JET PUMP MODEL                  *00083900
*710000      C171        SNGLVOL                                             *00084000
*710101      4.743-4  0.203    0.0  0.0  -90.0  -0.0605  0.00005  0.0 00     *00084100
*710200      3  7.29093+6  551.7  0.0                                         *00084200
*                                                                            *00084300
*********************************************************************************00084400
*                                                                              *00084500
*   INTACT JET PUMP                                                            *00084600
*                                                                              *00084700
*800000    C180     BRANCH                                                    *00084800
*                                                                              *00084900
*800001    2     1                                                            *00085000
*                                                                              *00085100
*800101  5.851-4  0.406 0.0  0.0  -90.0  -0.406  0.00005  0.0273  00          *00085200
*                                                                              *00085300
*800200  3   7.38813+6    551.7    0.0                                        *00085400
*                                                                              *00085500
*801101  160010000 180000000  1.108-4     0.936 0.510 0000                    *00085600
*802101  180010000 185000000  5.851-4     0.07  0.01  0000                    *00085700
*                                                                              *00085800
*801201   3.00    0.0  0.0                                                    *00085900
*802201   8.00    0.0  0.0                                                    *00086000
*                                                                              *00086100
*********************************************************************************00086200
* INTACT JET PUMP SUCTION LINE (MODEFIED FOR JAERI JET PUMP MODEL)             *00086300
*********************************************************************************00086400
1700000   C170  PIPE                                                          *00086500
1700001   2                                                                    *00086600
1700101   0.003048  1                                                         *00086700
1700102   0.002316  2                                                         *00086800
1700201   0.002316  1                                                         *00086900
1700301   1.304     1                                                         *00087000
1700302   0.973     2                                                         *00087100
1700601   0.0       1                                                         *00087200
1700602   -90.0     2                                                         *00087300
1700701   0.0       1                                                         *00087400
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                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
1700702   -0.073    2                                                        *00087500
1700801   0.00005   0.0623    1                                              *00087600
1700802   0.00005   0.0       2                                              *00087700
1700901   1.05 1.05 1                                                        *00087800
1701001   00        2                                                        *00087900
1701101   0000      1                                                        *00088000
1701201   3  7.30780+6  552.69 0.0  0.0  1                                   *00088100
1701202   3  7.30150+6  554.50 0.0  0.0  2                                   *00088200
1701300   1                                                                  *00088300
1701301  4.94   0.0  0.0      1                                              *00088400
*********************************************************************************00088500
* JAERI JET PUMP MODEL (INTACT LOOP) *                                        *00088600
*********************************************************************************00088700
1800000   C180  JETPUMP                                                      *00088800
1800001   3  1                                                               *00088900
1800101   0.0 0.402 7.0421-4  0.0 -90.0 -0.402 0.00005 0.0334 00             *00089000
1800200   3 7.34120+6 552.43                                                 *00089100
1800301   0.05349 0.01566 0.0084 0.0193 0.021  0.0193 0.0495                 *00089200
1800401   0.033 0.025 0.0 0.117 0.285                                        *00089300
1800501   0.024 0.024 0.0 0.024 1.8   0.024                                 *00089400
1800601   2                                                                 *00089500
1801101   160010000 180000000  1.108-4  0.936 2.0   0000                   *00089600
1802101   170010000 180000000  1.342-3  3.22  0.650 0000                   *00089700
1803101   180010000 185000000  3.849-3  0.0   0.0   0000                   *00089800
1801201   3.17    0.0  0.0                                                  *00089900
1802201   4.94    0.0  0.0                                                  *00090000
1803201   8.11    0.0  0.0                                                  *00090100
*********************************************************************************00090200
*                                                                             *00090300
*  INTACT JET PUMP OUTLET LINE          (VOLUME22 .... RELAP4J)             *00090400
*                                                                             *00090500
*          NAME          TYPE                                               *00090600
1850000    C185          PIPE                                               *00090700
1850001   4                                                                  *00090800
1850101   0.003849   1                                                       *00090900
1850102   0.0        2                                                       *00091000
1850103   0.004289   4                                                       *00091100
1850201   0.003849   1                                                       *00091200
1850202   0.004289   2                                                       *00091300
1850203   0.0        3                                                       *00091400
1850301   1.396      1                                                       *00091500
1850302   0.4243     2                                                       *00091600
1850303   2.0864     3                                                       *00091700
1850304   1.8464     4                                                       *00091800
1850401   0.0        1                                                       *00091900
1850402   0.003073   2                                                       *00092000
1850403   0.0        4                                                       *00092100
1850501   0.0        4                                                       *00092200
1850601   -90.0      4                                                       *00092300
1850701   -1.396     1                                                       *00092400
1850702   -0.300     2                                                       *00092500
1850703   -0.240     3                                                       *00092600
1850704   -0.2729    4                                                       *00092700
1850801   0.00005 0.0700   1                                                *00092800
1850802   0.00005 0.0960   2                                                *00092900
1850803   0.00005 0.0739   3                                                *00093000
1850804   0.00005 0.0739   4                                                *00093100
1850901   3.597  3.597  1                                                   *00093200
1850902   0.3    1.00   2                                                   *00093300
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                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
1850903    0.832  0.832  3                                                      *00093400
1851001    00         4                                                         *00093500
1851101    0000       3                                                         *00093600
1851201    3    7.35640+6   552.40   0.0  0.0  1                              *00093700
1851202    3    7.35360+6   552.38   0.0  0.0  2                              *00093800
1851203    3    7.35260+6   552.30   0.0  0.0  3                              *00093900
1851204    3    7.35140+6   552.22   0.0  0.0  4                              *00094000
1851300    1                                                                   *00094100
1851301    8.11     0.0     0.0     1                                          *00094200
1851302    8.11     0.0     0.0     2                                          *00094300
1851303    8.11     0.0     0.0     3                                          *00094400
*                                                                              *00094500
*********************************************************************************00094600
*                                                                              *00094700
*  BROKEN RECIRCULATION INLET LINE     (VOLUME15 .... RELAP4J)                 *00094800
*                                                                              *00094900
*           NAME         TYPE                                                 *00095000
1900000     C190         PIPE                                                  *00095100
1900001     3                                                                  *00095200
1900101   0.0019244        3                                                   *00095300
1900201   0.0              2                                                   *00095400
1900301   2.1317           1                                                   *00095500
1900302   2.5127           2                                                   *00095600
1900303   2.5424           3                                                   *00095700
1900401   0.0              3                                                   *00095800
1900501   0.0              3                                                   *00095900
1900601   -90.0            2                                                   *00096000
1900602   0.0              3                                                   *00096100
1900701   -0.154           1                                                   *00096200
1900702   -1.285           2                                                   *00096300
1900703   -0.0             3                                                   *00096400
1900801   0.00005  0.0495    3                                                 *00096500
1900901   0.185    0.185     1                                                 *00096600
1900902   0.345    0.345     2                                                 *00096700
1901001   00             3                                                     *00096800
1901101   0000           2                                                     *00096900
1901201   3     7.32220+6   551.80   0.0  0.0  1                              *00097000
1901202   3     7.32570+6   551.72   0.0  0.0  2                              *00097100
1901203   3     7.32820+6   551.67   0.0  0.0  3                              *00097200
1901300   1                                                                   *00097300
1901301   3.17     0.0     0.0     1                                          *00097400
1901302   3.17     0.0     0.0     2                                          *00097500
*                                                                              *00097600
*********************************************************************************00097700
*                                                                              *00097800
*  BROKEN RECIRCULATION INLET LINE     (VOLUME16 .... RELAP4J)                 *00097900
*                                                                              *00098000
*           NAME         TYPE                                                 *00098100
2000000     C200         PIPE                                                  *00098200
2000001     3                                                                  *00098300
2000101   0.0019244        3                                                   *00098400
2000201   0.0              2                                                   *00098500
2000301   2.0659           1                                                   *00098600
2000302   2.6398           2                                                   *00098700
2000303   2.3574           3                                                   *00098800
2000401   0.0              3                                                   *00098900
2000501   0.0              3                                                   *00099000
2000601   -90.0            1                                                   *00099100
2000602   0.0              2                                                   *00099200

                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
2000603   -90.0            3                                                   *00099300
2000701   -0.219           1                                                   *00099400
2000702   -0.0             2                                                   *00099500
2000703   -1.515           3                                                   *00099600
2000801   0.00005 0.0495   3                                                   *00099700
2000901   0.325    0.325     1                                                 *00099800
2000902   0.17     0.17      2                                                 *00099900
2001001   00             3                                                     *00100000
2001101   0000           2                                                     *00100100
2001201   3     7.32410+6   551.65   0.0  0.0  1                              *00100200
2001202   3     7.32280+6   551.64   0.0  0.0  2                              *00100300
2001203   3     7.32650+6   551.64   0.0  0.0  3                              *00100400
2001300   1                                                                   *00100500
2001301   3.17     0.0     0.0     1                                          *00100600
2001302   3.17     0.0     0.0     2                                          *00100700
*                                                                              *00100800
*********************************************************************************00100900
*                                                                              *00101000
*  BROKEN RECIRCULATION PUMP           (VOLUME17 .... RELAP4J)                 *00101100
*                                                                              *00101200
*           NAME         TYPE                                                 *00101300
2100000     C210         PUMP                                                  *00101400
*                                                                              *00101500
*          AREA    LEN    VOL    HZ     VR     ELV    CTL                     *00101600
2100101  0.0  0.26    0.005295  0.0  -90.0  -0.26    0                        *00101700
*                                                                              *00101800
*           VOL NO     AREA     F-LOSS R-LOSS CAHS                           *00101900
2100108    200010000  0.0019244   0.00   0.00   0000                         *00102000
*                                                                              *00102100
*           VOL NO     AREA     F-LOSS R-LOSS CAHS                           *00102200
2100109    220000000  0.0002746   0.1    0.1    0000                         *00102300
*                                                                              *00102400
*          CTL     PRESSURE      TEMP        ZERO                            *00102500
2100200     3     7.60230+6     552.11      0.0                              *00102600
*                                                                              *00102700
*          CTL     FLOW-F  FLOW-G   VELJ                                     *00102800
2100201     1      3.17     0.0      0.0                                      *00102900
*                                                                              *00103000
*          CTL     FLOW-F  FLOW-G   VELJ                                     *00103100
2100202     1      3.17     0.0      0.0                                      *00103200
*                                                                              *00103300
*          TAB-D   TWO-P    DIF-T   MOTOR  TAB-S  TRIP  REVER                *00103400
2100301     150      150      150     -1     -1     510     1                *00103500
*                                                                              *00103600
*          R-SP    I/R     R-FL    R-HD    R-TOR M-IN  R-DEN                 *00103700
2100302   376.99  0.580   0.0075 262.0 184.2 0.475 1000.0                     *00103800
*                                                                              *00103900
*         R-M-TR    FR-TF2     FR-TFO     FR-TF1     FR-TF3                  *00104000
2100303    0.0       7.56       0.001      0.0        42.7                    *00104100
*                                                                              *00104200
*         ELS TM  MX-F     MX-R                                              *00104300
2100310   0.0     0.0      0.0                                               *00104400
*                                                                              *00104500
*********************************************************************************00104600
*                                                                              *00104700
*  BROKEN RECIRCULATION OUTLET LINE    (VOLUME18,19,.. RELAP4J)                *00104800
*                                                                              *00104900
*           NAME         TYPE                                                 *00105000
2200000     C220         PIPE                                                  *00105100
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                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*                                                                              *00105200
*          NO.VOL                                                              *00105300
2200001     5                                                                  *00105400
2200101    0.0019244        4                                                  *00105500
2200102    0.0              5                                                  *00105600
2200201    0.0              3                                                  *00105700
2200202    0.0023162        4                                                  *00105800
2200301    2.0046           1                                                  *00105900
2200302    2.5762           2                                                  *00106000
2200303    2.6315           3                                                  *00106100
2200304    2.2613           4                                                  *00106200
2200305    0.859            5                                                  *00106300
2200401    0.0              4                                                  *00106400
2200402    0.001776         5                                                  *00106500
2200501    0.0              5                                                  *00106600
2200601    90.0             1                                                  *00106700
2200602    0.0              2                                                  *00106800
2200603    90.0             4                                                  *00106900
2200604    -90.0            5                                                  *00107000
2200701    1.275            1                                                  *00107100
2200702    0.0              2                                                  *00107200
2200703    2.3485           3                                                  *00107300
2200704    2.1715           4                                                  *00107400
2200705    -0.559           5                                                  *00107500
2200801    0.00005 0.0495   4                                                  *00107600
2200802    0.00005 0.0513   5                                                  *00107700
2200901    0.26      0.26       1                                             *00107800
2200902   13.903    13.903      2                                             *00107900
2200903    0.085     0.085      3                                             *00108000
2200904    0.414     0.414      4                                             *00108100
2201001    00              5                                                  *00108200
2201101    0000            4                                                  *00108300
2201201    3    7.86520+6   552.21   0.0  0.0  1                             *00108400
2201202    3    7.85850+6   552.22   0.0  0.0  2                             *00108500
2201203    3    7.82500+6   552.21   0.0  0.0  3                             *00108600
2201204    3    7.80640+6   552.15   0.0  0.0  4                             *00108700
2201205    3    7.79860+6   552.21   0.0  0.0  5                             *00108800
2201300    1                                                                  *00108900
2201301    3.17     0.0      0.0      1                                        *00109000
2201302    3.17     0.0      0.0      2                                        *00109100
2201303    3.17     0.0      0.0      3                                        *00109200
2201304    3.17     0.0      0.0      4                                        *00109300
*                                                                              *00109400
********************************************************************************00109500
*                                                                              *00109600
*  BROKEN JET PUMP SUCTION LINE                                                *00109700
*300000    C230       SNGLVOL                                                  *00109800
*300101    0.003048  1.304  0.0  0.0  0.0  0.0  0.00005  0.0623  00            *00109900
*300200    3   7.29093+6   551.7   0.0                                         *00110000
*                                                                              *00110100
********************************************************************************00110200
*                                                                              *00110300
*  BROKEN JET PUMP SUCTION   ....  SMALL PUMP ASSUMED                          *00110400
*310000    C231       PUMP                                                     *00110500
*310101    0.0  0.973  0.002225  0.0  -90.0  -0.073  0                        *00110600
*310108    230010000   0.003048  0.6438 0.6438 0000                           *00110700
*310109    240000000    0.000474   0.042 0.021 0000                          *00110800
*310200    3    7.39435+6   551.7   0.0                                       *00110900
*310201    1     5.00    0.0    0.0                                           *00111000


                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*310202    1     5.00    0.0    0.0                                           *00111100
*310301    150   150   150  -1   -1   510   1                                 *00111200
*310302    376.99  0.5344 0.01250 20.0   184.24  1.9  765.76                 *00111300
*310303    0.0   0.0   0.0   0.0   0.0                                        *00111400
*310310    0.0   0.0   0.0                                                    *00111500
*                          ....  NAIG JET PUMP MODEL                           *00111600
*310000    C231       SNGLVOL                                                 *00111700
*310101    4.743-4  0.203   0.0  0.0  -90.0  -0.0605  0.00005  0.0  00       *00111800
*310200    3  7.29093+6  551.7  0.0                                           *00111900
*                                                                              *00112000
********************************************************************************00112100
*                                                                              *00112200
*   BROKEN JET PUMP                                                            *00112300
*                                                                              *00112400
*400000   C240    BRANCH                                                      *00112500
*                                                                              *00112600
*400001   2     1                                                             *00112700
*                                                                              *00112800
*400101  5.851-4   0.406  0.0  0.0  -90.0  -0.406  0.00005  0.0273  00        *00112900
*                                                                              *00113000
*400200  3    7.38813+6   551.7    0.0                                        *00113100
*                                                                              *00113200
*401101  220010000 240000000  1.108-4    0.936   0.510   0000                *00113300
*402101  240010000 245000000  5.851-4    0.07    0.01    0000                *00113400
*                                                                              *00113500
*401201   3.00    0.0     0.0                                                 *00113600
*402201   8.00    0.0     0.0                                                 *00113700
*                                                                              *00113800
********************************************************************************00113900
* BROKEN JET PUMP SUCTION LINE (MODEFIED FOR JAERI JET PUMP MODEL)             *00114000
********************************************************************************00114100
2300000   C230  PIPE                                                          *00114200
2300001   2                                                                    *00114300
2300101   0.003048  1                                                         *00114400
2300102   0.002316  2                                                         *00114500
2300201   0.002316  1                                                         *00114600
2300301   1.304     1                                                         *00114700
2300302   0.973     2                                                         *00114800
2300601   0.0       1                                                         *00114900
2300602   -90.0     2                                                         *00115000
2300701   0.0       1                                                         *00115100
2300702   -0.073    2                                                         *00115200
2300801   0.00005   0.0623    1                                              *00115300
2300802   0.00005   0.0       2                                              *00115400
2300901   1.05 1.05 1                                                         *00115500
2301001   00        2                                                         *00115600
2301101   0000      1                                                         *00115700
2301201   3  7.30840+6  552.69 0.0  0.0  1                                   *00115800
2301202   3  7.30370+6  554.50 0.0  0.0  2                                   *00115900
2301300   1                                                                   *00116000
2301301  4.94   0.0  0.0      1                                               *00116100
********************************************************************************00116200
* JAERI JET PUMP MODEL (BROKEN LOOP) *                                        *00116300
********************************************************************************00116400
2400000   C240  JETPUMP                                                      *00116500
2400001   3  1                                                               *00116600
2400101   0.0 0.402 7.0421-4  0.0 -90.0 -0.402 0.00005 0.0334 00            *00116700
2400200   3 7.34460+6 552.47                                                 *00116800
2400301   0.05349 0.01566 0.0084 0.0193 0.021  0.0193 0.0495                 *00116900
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                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
2400401   0.033 0.025 0.0 0.117 0.285                                          *00117000
2400501   0.024 0.024 0.0 0.024 1.6   0.024                                   *00117100
2400601   2                                                                    *00117200
2401101   220010000 240000000  1.108-4  0.936 2.0   0000                     *00117300
2402101   230010000 240000000  1.342-3  3.22  0.650 0000                     *00117400
2403101   240010000 245000000  3.849-3  0.0   0.0   0000                     *00117500
2401201   3.17    0.0  0.0                                                     *00117600
2402201   4.94    0.0  0.0                                                     *00117700
2403201   8.11    0.0  0.0                                                     *00117800
*************************************************************************** *00117900
*                                                                            *00118000
*  BROKEN JET PUMP OUTLET LINE          (VOLUME14 .... RELAP4J)              *00118100
*                                                                            *00118200
*          NAME         TYPE                                                 *00118300
2450000    C245         PIPE                                                 *00118400
2450001    4                                                                 *00118500
2450101    0.003849     1                                                    *00118600
2450102    0.0          2                                                    *00118700
2450103    0.004289     4                                                    *00118800
2450201    0.003849     1                                                    *00118900
2450202    0.004289     2                                                    *00119000
2450203    0.0          3                                                    *00119100
2450301    1.396        1                                                    *00119200
2450302    0.4243       2                                                    *00119300
2450303    2.0864       3                                                    *00119400
2450304    1.8464       4                                                    *00119500
2450401    0.0          1                                                    *00119600
2450402    0.003073     2                                                    *00119700
2450403    0.0          4                                                    *00119800
2450501    0.0          4                                                    *00119900
2450601    -90.0        4                                                    *00120000
2450701    -1.396       1                                                    *00120100
2450702    -0.3000      2                                                    *00120200
2450703    -0.240       3                                                    *00120300
2450704    -0.2729      4                                                    *00120400
2450801    0.00005 0.0700   1                                                *00120500
2450802    0.00005 0.0960   2                                                *00120600
2450803    0.00005 0.0739   4                                                *00120700
2450901    5.369    5.369    1                                               *00120800
2450902    0.3      1.0      2                                               *00120900
2450903    0.832    0.832    3                                               *00121000
2451001    00         4                                                      *00121100
2451101    0000       3                                                      *00121200
2451201    3     7.36160+6   552.44  0.0  0.0  1                            *00121300
2451202    3     7.35340+6   552.42  0.0  0.0  2                            *00121400
2451203    3     7.35260+6   552.35  0.0  0.0  3                            *00121500
2451204    3     7.35140+6   552.28  0.0  0.0  4                            *00121600
2451300    1                                                                *00121700
2451301   8.11      0.0     0.0     1                                        *00121800
2451302   8.11      0.0     0.0     2                                        *00121900
2451303   8.11      0.0     0.0     3                                        *00122000
*                                                                           *00122100
*************************************************************************** *00122200
*  QUICK SHUTT-OFF VALVE      NOT USED IN THE SMALL BREAK TEST SERIES       *00122300
2500000     C250        VALVE                                               *00122400
2500101    190010000 200000000  0.0019244  2.0   2.0   0000                *00122500
2500201    1   3.0341  0.0   0.0                                            *00122600
2500300     TRPVLV                                                          *00122700
2500301                513                                                  *00122800

                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*                                                                           *00122900
*************************************************************************** *00123000
*                                                                           *00123100
*  VESSEL SIDE BREAK  (BRK B)           (JUNCTION55 .... RELAP4J)           *00123200
*                                                                           *00123300
*          NAME         TYPE                                               *00123400
2600000    C260         VALVE                                               *00123500
*                                                                           *00123600
*           FR          TO        AREA     F-LOS  R-LOS CAHS               *00123700
2600101   190010000 550000000  19.24-4    0.0    0.0   0100                *00123800
*                                                                           *00123900
*          CTL    FLOW-F FLOW-G  VELJ                                       *00124000
2600201    1      0.0    0.0    0.0                                         *00124100
*                                                                           *00124200
*          VALVE TYPE    TRIP.NO                                           *00124300
2600300    TRPVLV                                                          *00124400
2600301                    526                                              *00124500
*                                                                           *00124600
*************************************************************************** *00124700
5500000     C550        SNGLVOL                                             *00124800
5500101    19.24-4  0.4  0.0  0.0  0.0  0.0  0.0  0.00005  0.0495  00       *00124900
5500200    3   7.35350+6   511.7   0.0                                      *00125000
*                                                                           *00125100
5550000     C555        VALVE                                               *00125200
5550101    550010000 560000000  5.391-4    0.0    0.0    0100             *00125300
5550201    1   0.0   0.0   0.0                                              *00125400
5550300    TRPVLV                                                          *00125500
5550301                    526                                              *00125600
*                                                                           *00125700
5600000     C560        SNGLVOL                                             *00125800
5600101    5.391-4  0.3  0.0  0.0  0.0  0.0  0.0  0.00005  0.0262  00      *00125900
5600200    3   7.35350+6   511.7   0.0                                      *00126000
*                                                                           *00126100
5650000     C565        VALVE                                               *00126200
5650101    560010000 280000000  2.734-5    0.0    0.0    0100             *00126300
5650201    1   0.0   0.0   0.0                                              *00126400
5650300    TRPVLV                                                          *00126500
5650301                    526                                              *00126600
*************************************************************************** *00126700
*  PUMP SIDE BREAK  ( BRK A)       NOT USED IN THE SMALL BREAK TEST        *00126800
2700000    C270         VALVE                                               *00126900
2700101    200000000 551000000  19.24-4    0.0    0.0    0100             *00127000
2700201    1    0.0   0.0   0.0                                             *00127100
2700300    TRPVLV                                                          *00127200
2700301                    527                                              *00127300
*************************************************************************** *00127400
5510000     C551        SNGLVOL                                             *00127500
5510101    19.24-4  0.4  0.0  0.0  0.0  0.0  0.0  0.00005  0.0495  00       *00127600
5510200    3   7.35350+6   511.7   0.0                                      *00127700
*                                                                           *00127800
5560000     C556        VALVE                                               *00127900
5560101    551010000 561000000  5.391-4    0.0    0.0    0100             *00128000
5560201    1   0.0   0.0   0.0                                              *00128100
5560300    TRPVLV                                                          *00128200
5560301                    527                                              *00128300
*                                                                           *00128400
5610000     C561        SNGLVOL                                             *00128500
5610101    5.391-4  0.3  0.0  0.0  0.0  0.0  0.0  0.00005  0.0262  00      *00128600
5610200    3   7.35350+6   511.7   0.0                                      *00128700
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                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*                                                                              *00128800
5660000     C566       VALVE                                                   *00128900
5660101     561010000 281000000  5.391-4    0.0    0.0    0100               *00129000
5660201     1    0.0   0.0   0.0                                               *00129100
5660300     TRPVLV                                                            *00129200
5660301                  527                                                  *00129300
*******************************************************************************00129400
*                                                                              *00129500
*  CONTAINTMENT                                                                *00129600
*          NAME         TYPE                                                   *00129700
2800000     C280         TMDPVOL                                                *00129800
*                                                                              *00129900
*         AREA  LEN   VOL    HZ   VR  ELV  ROU  HYD  FE                        *00130000
2800101   1.0+3  0.0  1.0+6  0.0  0.0  0.0  0.0  0.0  11                        *00130100
*                                                                              *00130200
*         CTL                                                                  *00130300
2800200     3                                                                  *00130400
*                                                                              *00130500
*          TIME     PRESSURE  TEMP                                             *00130600
2800201     0.0      9.8043+4  303.15     * CONSTANT                           *00130700
*                                                                              *00130800
*******************************************************************************00130900
*                                                                              *00131000
*  MAIN STEAM RESERVOIR                  * ENTHALPY CALCULATION                *00131100
*                                                                              *00131200
*           NAME         TYPE                                                  *00131300
2900000     C290         TMDPVOL                                                *00131400
*                                                                              *00131500
*                                                                              *00131600
2900101   1.0+3  0.0  1.0+6  0.0  0.0  0.0  0.0  0.0  11                        *00131700
*                                                                              *00131800
*          CTL                                                                 *00131900
2900200     2                                                                  *00132000
*                                                                              *00132100
*          TIME     PRESSURE   QUALITY                                         *00132200
2900201     0.0      7.2900+6   1.0          * CONSTANT                        *00132300
*                                                                              *00132400
*******************************************************************************00132500
*                                                                              *00132600
*  MAIN STEAM (STEADY LINE)                                                    *00132700
*                                                                              *00132800
*          NAME         TYPE                                                   *00132900
3000000     C300         TMDPJUN                                                *00133000
*                                                                              *00133100
*           FR          TO        AREA                                         *00133200
3000101   290000000 080010000  1.0                                             *00133300
*                                                                              *00133400
*          CTL                                                                 *00133500
3000200     0                                                                  *00133600
*                                                                              *00133700
*          TIME      FLOW-F    FLOW-G  VELJ                                    *00133800
3000201     0.0       0.0      -0.05094 0.0                                    *00133900
3000202     1.6       0.0      -0.04972 0.0                                    *00134000
3000203     4.7       0.0      -0.05829 0.0                                    *00134100
3000204    12.5       0.0      -0.05921 0.0                                    *00134200
3000205    20.3       0.0      -0.05875 0.0                                    *00134300
3000206    24.2       0.0       0.0     0.0                                    *00134400
3000207  1000.0       0.0       0.0     0.0                                    *00134500
*                                                                              *00134600

                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*******************************************************************************00134700
*                                                                              *00134800
*  ADS RESERVOIR                         * ENTHALPY CALCULATION                *00134900
3300000     C330      TMDPVOL                                                  *00135000
3300101     1.0+3  0.0  1.0+6  0.0  0.0  0.0  0.0  0.0  11                     *00135100
3300200     2                                                                  *00135200
3300201     0.0    7.2900+6     1.0            * CONSTANT                      *00135300
*                                                                              *00135400
*******************************************************************************00135500
*                                                                              *00135600
*  ADS JUNCTION         TIME DEPENDENT JUNCTION                                *00135700
3400000     C340     TMDPJUN                                                   *00135800
3400101     330000000 080010000  1.0                                           *00135900
3400200     0                                                                  *00136000
3400201       0.0       0.0       0.0       0.0                                *00136100
3400202     155.7       0.0       0.0       0.0                                *00136200
3400203     160.0       0.0      -0.03418   0.0                                *00136300
3400204     175.3       0.0      -0.03571   0.0                                *00136400
3400205     194.4       0.0      -0.03630   0.0                                *00136500
3400206     240.0       0.0      -0.03756   0.0                                *00136600
3400207     280.2       0.0      -0.04026   0.0                                *00136700
3400208     320.0       0.0      -0.04199   0.0                                *00136800
3400209     356.7       0.0      -0.04318   0.0                                *00136900
3400210     400.0       0.0      -0.04474   0.0                                *00137000
3400211     437.9       0.0      -0.04723   0.0                                *00137100
3400212     480.0       0.0      -0.05205   0.0                                *00137200
3400213     560.0       0.0      -0.05566   0.0                                *00137300
3400214     640.0       0.0      -0.06622   0.0                                *00137400
*                                                                              *00137500
*******************************************************************************00137600
*                                                  *                            00137700
*  MAIN STEAM ( SAFETY VALVE ) RESERVOIR           *                            00137800
*                                                  *                            00137900
2920000     C292    TMDPVOL                         *                            00138000
2920101     1.0+3  0.0  1.0+6  0.0  0.0  0.0  0.0  0.0  11*                     00138100
2920200     3                                       *                            00138200
2920201     0.0   0.09804+6   303.15      * CONSTANT*                            00138300
*                                                   *                           00138400
*******************************************************************************00138500
*                                                  *                            00138600
*  MAIN STEAM (SAFETY VALVE  )                     *                            00138700
*                                                  *                            00138800
3020000     C302    VALVE                           *                            00138900
3020101     080010000  292000000   2.895-4  0.0  0.0  0000*                     00139000
3020201     1    0.0   0.0   0.0                    *                            00139100
3020300     TRPVLV                                  *                            00139200
3020301                 531                         *                            00139300
*                                                   *                           00139400
*******************************************************************************00139500
*                                                                              *00139600
*  HPCS RESERVOIR                                                              *00139700
*                                                                              *00139800
*2920000     C292    TMDPVOL                                                   *00139900
*2920101     1.0+3  0.0  1.0+6  0.0  0.0  0.0  0.0  0.0  11                     *00140000
*2920200     3                                                                 *00140100
*2920201     0.0   0.0980+6   303.15      * CONSTANT                           *00140200
*                                                                              *00140300
*******************************************************************************00140400
*                                                                              *00140500
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                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*  HPCS                                                                        *00140600
*                                                                              *00140700
*3020000     C302    TMDPJUN                                                  *00140800
*3020101    292000000  051010000   1.157-3                                    *00140900
*3020200     0                                                                *00141000
*3020201     0.0        0.0       0.0     0.0    *                           *00141100
*3020202    31.5        0.0       0.0     0.0    *                           *00141200
*3020203    33.8        0.628     0.0     0.0    *                           *00141300
*3020204    34.3        0.670     0.0     0.0    *                           *00141400
*3020205    35.6        0.681     0.0     0.0    *                           *00141500
*3020206    37.5        0.686     0.0     0.0    *                           *00141600
*3020207    60.0        0.696     0.0     0.0    *                           *00141700
*3020208    90.0        0.702     0.0     0.0    *                           *00141800
*3020209   180.0        0.712     0.0     0.0    *                           *00141900
*3020210  1000.0        0.712     0.0     0.0    *                           *00142000
*                                                                             *00142100
*****************************************************************************00142200
*                                                                             *00142300
*       FEEDWATER RESERVOIR              * ENTHALPY CALCULATION               *00142400
*                                                                             *00142500
*            NAME         TYPE                                              *00142600
3100000     C310         TMDPVOL                                             *00142700
*                                                                             *00142800
*          AREA  LEN   VOL    HZ   VR   ELV  ROU  HYD  FE                    *00142900
3100101   1.0+3  0.0  1.0+6  0.0  0.0  0.0  0.0  0.0  11                      *00143000
*                                                                             *00143100
*          CTL                                                                *00143200
3100200     3                                                                 *00143300
*                                                                             *00143400
*          TIME    PRESSURE  TEMP                                            *00143500
3100201    0.0     7.5001+6   489.15       * CONSTANT                        *00143600
*                                                                             *00143700
*****************************************************************************00143800
*                                                                             *00143900
*       FEEDWATER                        *JUNCTION51 .... RELAP4J            *00144000
*                                                                             *00144100
*            NAME         TYPE                                              *00144200
3200000     C320         TMDPJUN                                             *00144300
*                                                                             *00144400
*            FR          TO         AREA                                     *00144500
3200101   310000000 111010000   1.0                                           *00144600
*                                                                             *00144700
*          CTL                                                                *00144800
3200200     0                                                                 *00144900
*                                                                             *00145000
*          TIME      FLOW-F   FLOE-G  VELJ                                   *00145100
3200201    0.0       2.49-3   0.0     0.0                                    *00145200
3200202    2.0       2.49-3   0.0     0.0                                    *00145300
3200203    3.1       0.0      0.0     0.0                                    *00145400
3200204  1000.0      0.0      0.0     0.0                                    *00145500
*                                                                             *00145600
*****************************************************************************00145700
*                                                                             *00145800
*  LPCI RESERVOIR           *  ENTHALPY CALCULATION                          *00145900
*                                                                             *00146000
*            NAME         TYPE                                              *00146100
3310000     C331         TMDPVOL                                             *00146200
*                                                                             *00146300
*          AREA  LEN   VOL    HZ   VR  ELV  ROU  HYD  FE                     *00146400

                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
3310101   1.0+3  0.0  1.0+6  0.0  0.0  0.0  0.0  0.0  11                      *00146500
*                                                                             *00146600
*          CTL                                                                *00146700
3310200     3                                                                 *00146800
*                                                                             *00146900
*          TIME     PRESSURE     TEMP                                        *00147000
3310201    0.0      0.39541+6     315.15     * CONSTANT                      *00147100
*                                                                             *00147200
*****************************************************************************00147300
*                                                                             *00147400
*  LPCI JUNCTION          TIME DEPENDENT JUNCTION                             *00147500
3500000     C350     TMDPJUN                                                  *00147600
3500101    331000000 100010000   1.0                                          *00147700
3500200     0                                                                 *00147800
3500201      0.0       0.0       0.0       0.0                               *00147900
3500202    406.6       0.0       0.0       0.0                               *00148000
3500203    408.1       2.22-3    0.0       0.0                               *00148100
3500204    435.9       2.88-3    0.0       0.0                               *00148200
3500205    454.5       3.29-3    0.0       0.0                               *00148300
3500206    467.0       3.47-3    0.0       0.0                               *00148400
3500207    486.2       3.60-3    0.0       0.0                               *00148500
3500208    534.9       3.73-3    0.0       0.0                               *00148600
3500209    571.2       3.80-3    0.0       0.0                               *00148700
3500210    608.3       3.82-3    0.0       0.0                               *00148800
3500211    640.0       3.80-3    0.0       0.0                               *00148900
3500212    683.3       3.65-3    0.0       0.0                               *00149000
3500213    694.1       3.13-3    0.0       0.0                               *00149100
*                                                                             *00149200
*****************************************************************************00149300
*                                                                             *00149400
*   LPCS RESERVOIR                  * ENTHALPY CALCULATION                    *00149500
*                                                                             *00149600
*            NAME         TYPE                                              *00149700
3320000     C332         TMDPVOL                                             *00149800
*                                                                             *00149900
*          AREA  LEN   VOL    HZ   VR  ELV  ROU  HYD  FE                     *00150000
3320101   1.0+3  0.0  1.0+6  0.0  0.0  0.0  0.0  0.0  11                      *00150100
*                                                                             *00150200
*          CTL                                                                *00150300
3320200     3                                                                 *00150400
*                                                                             *00150500
*          TIME     PRESSURE     TEMP                                        *00150600
3320201    0.0     0.39541+6     313.15     * CONSTANT                      *00150700
*                                                                             *00150800
*****************************************************************************00150900
*                                                                             *00151000
*  LPCS JUNCTION          TIME DEPENDENT JUNCTION                             *00151100
3600000     C360     TMDPJUN                                                  *00151200
3600101    332000000 051010000   1.0                                          *00151300
3600200     0                                                                 *00151400
3600201      0.0       0.0       0.0       0.0                               *00151500
3600202    318.5       0.0       0.0       0.0                               *00151600
3600203    320.0       7.90-4    0.0       0.0                               *00151700
3600204    361.9       8.48-4    0.0       0.0                               *00151800
3600205    400.0       9.14-4    0.0       0.0                               *00151900
3600206    473.8       1.09-3    0.0       0.0                               *00152000
3600207    487.7       1.10-3    0.0       0.0                               *00152100
3600208    496.9       1.09-3    0.0       0.0                               *00152200
3600209    560.0       1.12-3    0.0       0.0                               *00152300
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            GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
3600210    609.2       1.14-3   0.0        0.0                              *00152400
3600211    640.0       1.14-3   0.0        0.0                              *00152500
3600212    681.5       1.13-3   0.0        0.0                              *00152600
3600213    696.2       1.02-3   0.0        0.0                              *00152700
*                                                                           *00152800
*****************************************************************************00152900
*                                                                           *00153000
**********          HEAT SLABS                          ******************00153100
*                                                                           *00153200
*****************************************************************************00153300
*                                                                           *00153400
*  CORE     **** COMPOSED OF BN,HEATER,BN,INC600 ****                       *00153500
*     ***** HIGH POWER CHANNEL     (A CHANNEL)    10010000  ***************00153600
*     ***** AVERAGE POWER CHANNEL (B,C,D CHANNEL)10020000  ***************00153700
*                                                                           *00153800
****** AVERAGE POWER CHANNEL HEAT STRUCTURE ***************************00153900
*                                                                           *00154000
*          NH    NP    TYPE  S-FLG  L-COR                                   *00154100
10010000    7     9     2     1      0.0                                     *00154200
*                                                                           *00154300
*          LOC-F MESH-F                                                     *00154400
10010100    0     1                                                        *00154500
*                                                                           *00154600
*          NO ITV R-COR     NO ITV  R-COR      NO ITV  R-COR                *00154700
10010101    3     0.003051 ,  1    0.0037511,  1     0.004835,             *00154800
10010102    3     0.006135                                                 *00154900
*                                                                           *00155000
*          FLG                                                              *00155100
*0010200    0                                                              *00155200
*                                                                           *00155300
*          CMP NO                                                           *00155400
10010201    1    3, 2    4, 3    5, 4    8                                  *00155500
*                                                                           *00155600
*          FLG                                                              *00155700
*0010300    0                                                              *00155800
*                                                                           *00155900
*          SOURCE                                                           *00156000
10010301   0.0  3, 1.0  4, 0.0  5, 0.0  8                                  *00156100
*                                                                           *00156200
*          FLG                                                              *00156300
10010400    0                                                              *00156400
*                                                                           *00156500
*          TEMP      NP                                                     *00156600
10010401   554.8     9                                                     *00156700
*                                                                           *00156800
*LEFT      B.V.  INC   BCT   A-C     AREA    NH                             *00156900
10010501    0     0     0     0      0.0     7                              *00157000
*                                                                           *00157100
*RIGHT       B.V          INC   BCT  A-C  SARFACE  NH                       *00157200
10010601  040010000    10000    1    0    1.6849   3                       *00157300
10010602  040040000        0    1    0    3.3698   4                       *00157400
10010603  040050000    10000    1    0    1.6849   7                       *00157500
*                                                                           *00157600
*          TYPE   IS MULTI    L-D-H  R-D-H      NH                         *00157700
10010701   900     0.04109     0.0    0.0        1                         *00157800
10010702   900     0.07690     0.0    0.0        2                         *00157900
10010703   900     0.10360     0.0    0.0        3                         *00158000
10010704   900     0.23860     0.0    0.0        4                         *00158100
10010705   900     0.10360     0.0    0.0        5                         *00158200

            GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
10010706   900     0.07690     0.0    0.0        6                         *00158300
10010707   900     0.04109     0.0    0.0        7                         *00158400
*                                                                           *00158500
*LEFT      CHF    HYD      HEQ      CHAN    NH                             *00158600
10010801    0     0.0      0.0      0.0      7                             *00158700
*                                                                           *00158800
*RIGHT     CHF    HYD      HEQ      CHAN     NH                            *00158900
10010901    0     0.01306 0.01348 0.2350     3                            *00159000
10010902    0     0.01306 0.01348 0.4700     4                            *00159100
10010903    0     0.01306 0.01348 0.2350     7                            *00159200
*                                                                           *00159300
********** HIGH POWER CHANNEL HEAT STRUCTURE ***************************00159400
*                                                                           *00159500
10020000    7   9   2   1   0.0                                            *00159600
10020100    0010                                                         *00159700
*0020200    0010                                                         *00159800
*0020300    0010                                                         *00159900
10020400    0010                                                         *00160000
10020501    0   0   0   0   0.0   7                                        *00160100
10020601    045010000   10000   1   0   0.5616   3                       *00160200
10020602    045040000       0   1   0   1.1233   4                       *00160300
10020603    045050000   10000   1   0   0.5616   7                       *00160400
10020701    900    0.01918   0.0    0.0    1                             *00160500
10020702    900    0.03589   0.0    0.0    2                             *00160600
10020703    900    0.04833   0.0    0.0    3                             *00160700
10020704    900    0.11140   0.0    0.0    4                             *00160800
10020705    900    0.04833   0.0    0.0    5                             *00160900
10020706    900    0.03589   0.0    0.0    6                             *00161000
10020707    900    0.01918   0.0    0.0    7                             *00161100
10020801    0    0.0     0.0     0.0     7                               *00161200
10020901    0  0.01306  0.01348  0.2350    3                             *00161300
10020902    0  0.01306  0.01348  0.4700    4                             *00161400
10020903    0  0.01306  0.01348  0.2350    7                             *00161500
*                                                                           *00161600
*****************************************************************************00161700
*                                                                           *00161800
**********          HEAT STRUCTURES  ( VESSEL WALL )       ***************00161900
*                                                                           *00162000
11000000    1  4  1  1  0.0                                                *00162100
11000100    0  1                                                         *00162200
11000101    3  0.21                                                      *00162300
*1000200    0                                                            *00162400
11000201    5  3                                                         *00162500
*1000300    0                                                            *00162600
11000301    0.0   3                                                      *00162700
11000400    0                                                            *00162800
11000401    560.0   4                                                    *00162900
11000501    080010000   0   1   0   0.5153   1                           *00163000
11000601    900010000   0   1   0   0.5153   1                           *00163100
11000701    0   0.0   0.0   0.0   1                                      *00163200
11000801    0   0.7   0.0   0.5   1                                      *00163300
11000901    0   0.7   0.0   0.5   1                                      *00163400
*                                                                           *00163500
11100000    3  4  2  1  0.35                                               *00163600
11100100    0  1                                                         *00163700
11100101    3  0.405                                                     *00163800
*1100200    0                                                            *00163900
11100201    5  3                                                         *00164000
*1100300    0                                                            *00164100
```

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                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
11100301    0.0   3                                                          *00164200
11100400    0                                                                *00164300
11100401    560.0   4                                                        *00164400
11100501    080010000   0   1   1   0.348    1                               *00164500
11100502    070010000   0   1   1   0.2817   2                               *00164600
11100503    071010000   0   1   1   0.5503   3                               *00164700
11100601    900010000   0   1   1   0.348    1                               *00164800
11100602    900010000   0   1   1   0.2817   2                               *00164900
11100603    900010000   0   1   1   0.5503   3                               *00165000
11100701    0   0.0   0.0   0.0   3                                          *00165100
11100801    0   0.7   0.0   0.5   3                                          *00165200
11100901    0   0.81  0.0   0.5   3                                          *00165300
*                                                                            *00165400
11200000    1  4  2  1  0.3                                                  *00165500
11200100    0  1                                                            *00165600
11200101    3  0.345                                                        *00165700
*1200200    0                                                              *00165800
11200201    5  3                                                           *00165900
*1200300    0                                                              *00166000
11200301    0.0   3                                                        *00166100
11200400    0                                                              *00166200
11200401    560.0   4                                                      *00166300
11200501    110010000   0   1   1   0.2371   1                             *00166400
11200601    900010000   0   1   1   0.2371   1                             *00166500
11200701    0   0.0   0.0   0.0   1                                        *00166600
11200801    0   0.6   0.0   0.5   1                                        *00166700
11200901    0   0.69  0.0   0.5   1                                        *00166800
*                                                                          *00166900
11300000    4  4  2  1  0.3                                                *00167000
11300100    0  1                                                          *00167100
11300101    3  0.340                                                      *00167200
*1300200    0                                                            *00167300
11300201    5  3                                                         *00167400
*1300300    0                                                            *00167500
11300301    0.0   3                                                      *00167600
11300400    0                                                            *00167700
11300401    560.0   4                                                    *00167800
11300501    111010000   0   1   1   0.328    1                           *00167900
11300502    112030000   0   1   1   0.35     2                           *00168000
11300503    112020000   0   1   1   0.356    3                           *00168100
11300504    112010000   0   1   1   0.189    4                           *00168200
11300601    900010000   0   1   1   0.328    1                           *00168300
11300602    900010000   0   1   1   0.35     2                           *00168400
11300603    900010000   0   1   1   0.356    3                           *00168500
11300604    900010000   0   1   1   0.189    4                           *00168600
11300701    0   0.0   0.0   0.0   4                                      *00168700
11300801    0   0.6   0.0   0.5   4                                      *00168800
11300901    0   0.68  0.0   0.5   4                                      *00168900
*                                                                        *00169000
11400000    7  4  2  1  0.246                                            *00169100
11400100    0  1                                                        *00169200
11400101    3  0.286                                                    *00169300
*1400200    0                                                          *00169400
11400201    5  3                                                       *00169500
*1400300    0                                                          *00169600
11400301    0.0   3                                                    *00169700
11400400    0                                                          *00169800
11400401    560.0   4                                                  *00169900
11400501    120010000   0   1   1   0.541    1                         *00170000

                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
11400502    130040000   0   1   1   0.365    2                         *00170100
11400503    130030000   0   1   1   0.365    3                         *00170200
11400504    130020000   0   1   1   0.365    4                         *00170300
11400505    130010000   0   1   1   0.365    5                         *00170400
11400506    131010000   0   1   1   0.416    6                         *00170500
11400507    132010000   0   1   1   0.444    7                         *00170600
11400601    900010000   0   1   1   0.541    1                         *00170700
11400602    900010000   0   1   1   0.365    2                         *00170800
11400603    900010000   0   1   1   0.365    3                         *00170900
11400604    900010000   0   1   1   0.365    4                         *00171000
11400605    900010000   0   1   1   0.365    5                         *00171100
11400606    900010000   0   1   1   0.416    6                         *00171200
11400607    900010000   0   1   1   0.444    7                         *00171300
11400701    0   0.0   0.0   0.0   7                                    *00171400
11400801    0   0.492 0.0   0.5   7                                    *00171500
11400901    0   0.572 0.0   0.5   7                                    *00171600
*                                                                      *00171700
11500000    2  4  2  1  0.350                                          *00171800
11500100    0  1                                                      *00171900
11500101    3   0.505                                                 *00172000
*1500200    0                                                        *00172100
11500201    5  3                                                     *00172200
*1500300    0                                                        *00172300
11500301    0.0   3                                                  *00172400
11500400    0                                                        *00172500
11500401    560.0   4                                                *00172600
11500501    010010000   0   1   1   0.12     1                       *00172700
11500502    011010000   0   1   1   0.135    2                       *00172800
11500601    900010000   0   1   1   0.12     1                       *00172900
11500602    900010000   0   1   1   0.135    2                       *00173000
11500701    0   0.0   0.0   0.0   2                                  *00173100
11500801    0   0.7   0.0   0.5   2                                  *00173200
11500901    0   1.01  0.0   0.5   2                                  *00173300
*                                                                    *00173400
11600000    1  4  1  1  0.0                                          *00173500
11600100    0  1                                                    *00173600
11600101    3   0.180                                               *00173700
*1600200    0                                                      *00173800
11600201    5  3                                                   *00173900
*1600300    0                                                      *00174000
11600301    0.0  3                                                 *00174100
11600400    0                                                      *00174200
11600401    560.0   4                                              *00174300
11600501    900010000   0   1   0   0.801    1                     *00174400
11600601    011010000   0   1   0   0.801    1                     *00174500
11600701    0   0.0   0.0   0.0   1                                *00174600
11600801    0   0.7   0.0   0.5   1                                *00174700
11600901    0   0.7   0.0   0.5   1                                *00174800
*                                                                  *00174900
**********************************************************************00175000
*                                                                    *00175100
**********        HEAT STRUCTURE THERMAL PROPERTY DATA     ***********00175200
*                                                                    *00175300
**********************************************************************00175400
*                                                                    *00175500
* INNER BN          TYPE        K-FLAG    CV-FLAG                    *00175600
20100100          TBL/FCTN        1         1                        *00175700
*                                                                    *00175800
* HEATER                                                            *00175900
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                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
20100200          TBL/FCTN       1          1                                  *00176000
*                                                                              *00176100
* OUTER BN                                                                     *00176200
20100300          TBL/FCTN       1          1                                  *00176300
*                                                                              *00176400
* INCONEL600                                                                   *00176500
20100400          TBL/FCTN       1          1                                  *00176600
*                                                                              *00176700
* SUS                                                                          *00176800
20100500          TBL/FCTN       1          1                                  *00176900
*                                                                              *00177000
* MGO                                                                          *00177100
20100600          TBL/FCTN       1          1                                  *00177200
*                                                                              *00177300
* LEAD                                                                         *00177400
20100700          TBL/FCTN       1          1                                  *00177500
*                                                                              *00177600
**********   THERMAL CONDUCTIVITY   BTU/(S*FT*F)            ***********00177700
*                                                                              *00177800
* INNER BN   TEMP    COND       TEMP    COND       TEMP    COND               *00177900
20100101     293.15 29.7824     773.15 28.0379     973.15 27.1656              *00178000
20100102    1173.15 26.2933    1273.15 26.8541                                 *00178100
*                                                                              *00178200
* HEATER                                                                       *00178300
20100201     293.15 17.5081     373.15 13.8320    2873.15 11.6513              *00178400
*                                                                              *00178500
* OUTER BN                                                                     *00178600
20100301          5.7945         * CONSTANT                                   *00178700
*                                                                              *00178800
* INCONEL600                                                                   *00178900
20100401     294.26 14.8289     366.48 15.7012     477.59 17.5081              *00179000
20100402     588.71 19.1904     699.82 20.9350     810.93 22.8665              *00179100
20100403     922.04 24.7357    1033.15 26.8541    1144.26 28.9102              *00179200
*                                                                              *00179300
* SUS                                                                          *00179400
20100501     273.15 16.2620     773.15 20.9350                                 *00179500
*                                                                              *00179600
* MGO                                                                          *00179700
20100601     293.15 26.6672     573.15 20.6234     673.15 17.1966              *00179800
20100602     773.15 14.0813     873.15 11.7136     973.15 10.0313              *00179900
20100603    1073.15  8.7852    1273.15  6.9160    1473.15  6.2930              *00180000
20100604    1506.48  6.7291    1873.15  7.3522                                 *00180100
*                                                                              *00180200
* LEAD                                                                         *00180300
20100701          14.5798          * CONSTANT                                  *00180400
*                                                                              *00180500
**********   VOLUMETRIC HEAT CAPACITY     BTU/(FT3*F)       ***********00180600
*                                                                              *00180700
* INNER BN   TEMP     CAP       TEMP     CAP       TEMP     CAP               *00180800
20100151     293.15  3.0716+5   783.15  4.0106+5   1123.15  5.0635+5          *00180900
20100152    1533.15  6.3512+5                                                  *00181000
*                                                                              *00181100
* HEATER                                                                       *00181200
20100252     293.15  3.8496+6   373.15  3.7289+6   2873.15  3.8496+6          *00181300
*                                                                              *00181400
* OUTER BN                                                                     *00181500
20100351     293.15  3.0649+5   783.15  4.0173+5   1123.15  5.0702+5          *00181600
20100352    1533.15  6.3512+5                                                  *00181700
*                                                                              *00181800

                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
* INCONEL600                                                                  *00181900
20100451     294.26  3.7355+6   366.48  3.9100+6   477.60  4.0843+6           *00182000
20100452     588.71  4.2654+6   699.82  4.4398+6   810.93  4.6477+6           *00182100
20100453     922.04  4.9294+6  1033.15  5.1104+6  1144.26  5.2513+6           *00182200
*                                                                              *00182300
* SUS                                                                          *00182400
20100551          3.9770+6          * CONSTANT                                 *00182500
*                                                                              *00182600
* MGO                                                                          *00182700
20100651          3.3734+6          * CONSTANT                                 *00182800
*                                                                              *00182900
*                                                                              *00183000
20100751          3.6417+6          * CONSTANT                                 *00183100
*                                                                              *00183200
******************************************************************************00183300
******************************************************************************00183400
*                                                                              *00183500
**********  POWER  TRANSIENT DATA                              ***********00183600
*                                                                              *00183700
20290000    POWER                                                             *00183800
*             TIME      POWER                                                *00183900
*                                                                              *00184000
20290001       0.0       3.969+6 ***************************************00184100
20290002       8.8       3.969+6 *                                          *00184200
20290003      10.0       3.632+6 *                                          *00184300
20290004      14.0       2.707+6 *                                          *00184400
20290005      20.0       1.889+6 *                                          *00184500
20290006      24.0       1.536+6 *             COMMENT;                     *00184600
20290007      30.0       1.155+6 *                                          *00184700
20290008      40.0      0.9684+6 *       DATA FROM R926PST1                 *00184800
20290009      50.0      0.8136+6 *                                          *00184900
20290010      70.0      0.6668+6 *                                          *00185000
20290011     100.0      0.5517+6 *                                          *00185100
20290012     150.0      0.4485+6 *                                          *00185200
20290013     210.0      0.3374+6 *                                          *00185300
20290014     300.0      0.2739+6 *                                          *00185400
20290015     480.0      0.2500+6 *                                          *00185500
20290016     600.0      0.2342+6 *                                          *00185600
20290017    1800.0      0.1786+6 ***************************************00185700
*                                                                              *00185800
******************************************************************************00185900
*                                                                              *00186000
*  CONTAINTMENT                                                                *00186100
*           NAME        TYPE                                                   *00186200
2810000     C281        TMDPVOL                                                *00186300
*                                                                              *00186400
*         AREA  LEN   VOL    HZ   VR  ELV  ROU  HYD  FE                       *00186500
2810101   1.0+3  0.0  1.0+6  0.0  0.0  0.0  0.0  0.0  11                       *00186600
*                                                                              *00186700
*         CTL                                                                  *00186800
2810200    3                                                                  *00186900
*                                                                              *00187000
*         TIME      PRESSURE  TEMP                                           *00187100
2810201    0.0      0.0980+6  303.15      * CONSTANT                          *00187200
*                                                                              *00187300
******************************************************************************00187400
*     JET PUMP SUCTION AT BROKEN LOOP                                          *00187500
*300000    C530      SNGLJUN                                                  *00187600
*300101    230010000  231000000  4.743-4  0.1    0.1    0000                 *00187700
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                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
*300201    1      5.0      0.0      0.0                                          *00187800
*320000    C532       SNGLJUN                                                  *00187900
*320101    231010000  240000000  4.743-4  0.042  0.021  0000                  *00188000
*320201    1      5.0      0.0      0.0                                          *00188100
*     JET PUMP SUCTION AT INTACT LOOP                                           *00188200
*330000    C533       SNGLJUN                                                  *00188300
*330101    170010000  171000000  4.743-4  0.1    0.1    0000                  *00188400
*330201    1      5.0      0.0      0.0                                          *00188500
*340000    C534       SNGLJUN                                                  *00188600
*340101    171010000  180000000  4.743-4  0.042  0.021  0000                  *00188700
*340201    1      5.0      0.0      0.0                                          *00188800
*************************************************************************      *00188900
*                                                                             *00189000
******   FEED WATER LINE PIPING ( TRANSIENT FLASHING )                        *00189100
4000000    C400       SNGLVOL                                                  *00189200
*          AREA LEN    VOL       HZ      VR      ELV    ROUG      HYD  FE     *00189300
4000101    0.0  18.58 0.0357  0.0   -22.5   -7.11  0.00005  0.0  00          *00189400
4000200    3    7.2998+6    489.15    0.0                                      *00189500
*************************************************************************      *00189600
*                                                                             *00189700
******   FEED WATER LINE JUNCTION ( FOR FLASHING )                            *00189800
4100000    C410       SNGLJUN                                                  *00189900
4100101    400000000 111010000   1.924-3  2.47   1.88   0000                 *00190000
4100201    1   0.0    0.0    0.0                                              *00190100
*                                                                             *00190200
******   HEAT SINK FOR HEAT LOSS   ***********************************      *00190300
*                                                                             *00190400
9000000    C900       TMDPVOL                                                  *00190500
9000101    1.+3  0.0  1.+6  0.0  90.0   10.0   0.0   0.0   11                 *00190600
9000200    3                                                                   *00190700
9000201    0.0     0.09804+4     303.15        * CONSTANT                       *00190800
*                                                                             *00190900
*************************************************************************      *00191000
9100000    C910       VALVE                                                    *00191100
9100101    080010000   900000000  1.0-3   0.0  0.0    0100      *            *00191200
9100201    1    0.0   0.0   0.0                        *                       *00191300
9100300    TRPVLV                                                             *00191400
9100301              527                                                       *00191500
*                                                                             *00191600
*************************************************************************      *00191700
*************************************************************************      *00191800
*  MINOR EDIT                                                                 *00191900
*                                                                             *00192000
0000301  P          010010000                                                  *00192100
0000302  MFLOWJ     180010000                                                  *00192200
0000303  MFLOWJ     180020000                                                  *00192300
0000304  MFLOWJ     180030000                                                  *00192400
0000305  MFLOWJ     185010000                                                  *00192500
0000306  MFLOWJ     240010000                                                  *00192600
0000307  MFLOWJ     240020000                                                  *00192700
0000308  MFLOWJ     240030000                                                  *00192800
0000309  MFLOWJ     245010000                                                  *00192900
0000310  P          080010000                                                  *00193000
0000311  MFLOWJ     300000000                                                  *00193100
0000312  MFLOWJ     320000000                                                  *00193200
*0000313  MFLOWJ    302000000                                                  *00193300
0000314  MFLOWJ     360000000                                                  *00193400
0000315  MFLOWJ     350000000                                                  *00193500
0000316  MFLOWJ     260000000                                                  *00193600

                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
0000317  MFLOWJ     270000000                                                  *00193700
0000318  MFLOWJ     030010000                                                  *00193800
0000319  MFLOWJ     030020000                                                  *00193900
0000320  HTTEMP     001000109                                                  *00194000
0000321  HTTEMP     001000209                                                  *00194100
0000322  HTTEMP     001000309                                                  *00194200
0000323  HTTEMP     001000409                                                  *00194300
0000324  HTTEMP     001000509                                                  *00194400
0000325  HTTEMP     001000609                                                  *00194500
0000326  HTTEMP     001000709                                                  *00194600
0000327  MFLOWJ     050020000                                                  *00194700
0000328  VOIDGJ     030020000                                                  *00194800
0000329  VOIDG      040010000                                                  *00194900
0000330  VOIDG      040020000                                                  *00195000
0000331  VOIDG      040030000                                                  *00195100
0000332  VOIDG      040040000                                                  *00195200
0000333  VOIDG      040050000                                                  *00195300
0000334  VOIDG      040060000                                                  *00195400
0000335  VOIDG      040070000                                                  *00195500
0000336  VOIDGJ     050020000                                                  *00195600
0000337  MFLOWJ     031020000                                                  *00195700
0000338  HTTEMP     002000109                                                  *00195800
0000339  HTTEMP     002000209                                                  *00195900
0000340  HTTEMP     002000309                                                  *00196000
0000341  HTTEMP     002000409                                                  *00196100
0000342  HTTEMP     002000509                                                  *00196200
0000343  HTTEMP     002000609                                                  *00196300
0000344  HTTEMP     002000709                                                  *00196400
0000345  MFLOWJ     050010000                                                  *00196500
0000346  VOIDGJ     031020000                                                  *00196600
0000347  VOIDG      045010000                                                  *00196700
0000348  VOIDG      045020000                                                  *00196800
0000349  VOIDG      045030000                                                  *00196900
0000350  VOIDG      045040000                                                  *00197000
0000351  VOIDG      045050000                                                  *00197100
0000352  VOIDG      045060000                                                  *00197200
0000353  VOIDG      045070000                                                  *00197300
0000354  VOIDGJ     050010000                                                  *00197400
0000355  VOIDG      100010000                                                  *00197500
0000356  VOIDG      100020000                                                  *00197600
0000357  VOIDG      100030000                                                  *00197700
0000358  VOIDG      090010000                                                  *00197800
0000359  VOIDG      090020000                                                  *00197900
0000360  VOIDG      090030000                                                  *00198000
0000361  VOIDG      060040000                                                  *00198100
0000362  VOIDG      060010000                                                  *00198200
0000363  VOIDG      051020000                                                  *00198300
0000364  VOIDG      050010000                                                  *00198400
0000365  VOIDG      030010000                                                  *00198500
0000366  VOIDG      020020000                                                  *00198600
0000367  VOIDG      020010000                                                  *00198700
0000368  VOIDG      010010000                                                  *00198800
0000369  VOIDG      080010000                                                  *00198900
0000370  VOIDG      070010000                                                  *00199000
0000371  VOIDG      071010000                                                  *00199100
0000372  VOIDG      110010000                                                  *00199200
0000373  VOIDG      110010000                                                  *00199300
0000374  VOIDG      111010000                                                  *00199400
0000375  VOIDG      112030000                                                  *00199500
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                GEM  V10L10  DATE 84.07.31  TIME 19.13.37  LIB=J3491.RLPRSA1.DATA

----*----1----*----2----*----3----*----4----*----5----*----6----*----7-R--*----8
0000376  VOIDG     112020000                                                *00199600
0000377  VOIDG     112010000                                                *00199700
0000378  VOIDG     120010000                                                *00199800
0000379  VOIDG     130040000                                                *00199900
0000380  VOIDG     130030000                                                *00200000
0000381  VOIDG     130020000                                                *00200100
0000382  VOIDG     130010000                                                *00200200
0000383  VOIDG     131010000                                                *00200300
0000384  MFLOWJ    010010000                                                *00200400
0000385  MFLOWJ    010020000                                                *00200500
0000386  MFLOWJ    010030000                                                *00200600
0000387  MFLOWJ    010040000                                                *00200700
0000388  MFLOWJ    010050000                                                *00200800
0000389  MFLOWJ    030010000                                                *00200900
0000390  MFLOWJ    030020000                                                *00201000
0000391  MFLOWJ    030030000                                                *00201100
0000392  MFLOWJ    031020000                                                *00201200
0000393  MFLOWJ    050010000                                                *00201300
0000394  MFLOWJ    050020000                                                *00201400
0000395  MFLOWJ    050030000                                                *00201500
0000396  MFLOWJ    050040000                                                *00201600
0000397  VELFJ     050010000                                                *00201700
0000398  VELGJ     050010000                                                *00201800
. .                                                                         *00201900

HIGHEST SEVERITY CODE=00

STATISTICS: HIGHEST SEVERITY CODE=00
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付録2C－4　インプットデータリスト（RUN912, Small Pump Model）

```
*************************************************************************00082000
*  INTACT JET PUMP SUCTION LINE                                          *00082100
1700000     C170       SNGLVOL                                           *00082200
1700101     0.003048  1.304  0.0  0.0  0.0  0.0  0.00005  0.0623  00     *00082300
1700200     3   7.29093+6   551.7   0.0                                  *00082400
*                                                                        *00082500
*************************************************************************00082600
*                                                                        *00082700
*   INTACT JET PUMP SUCTION    ....   SMALL PUMP ASSUMED                 *00082800
1710000     C171       PUMP                                              *00082900
1710101     0.0   0.973  0.002225  0.0  -90.0  -0.073  0                 *00083000
1710108     170010000   0.003048  0.6438 0.6438 0000                     *00083100
1710109     180000000   0.000474  0.042  0.021  0000                    *00083200
1710200     3   7.39435+6   551.7   0.0                                  *00083300
1710201     1    4.94   0.0   0.0                                       *00083400
1710202     1    4.94   0.0   0.0                                       *00083500
1710301     150  150  150 -1  -1  509  1                                 *00083600
1710302     376.99  0.85   0.01250  20.0   184.24  1.9  765.76           *00083700
1710303     0.0  0.0  0.0  0.0  0.0                                      *00083800
1710310     0.0  0.0  0.0                                               *00083900
*************************************************************************00084500
*                                                                        *00084600
*   INTACT JET PUMP                                                      *00084700
*                                                                        *00084800
1800000   C180    BRANCH                                                 *00084900
*                                                                        *00085000
1800001   2     1                                                        *00085100
*                                                                        *00085200
1800101  5.851-4  0.406 0.0  0.0  -90.0  -0.406  0.00005  0.0273  00     *00085300
*                                                                        *00085400
1800200  3   7.38813+6   551.7   0.0                                     *00085500
*                                                                        *00085600
1801101  160010000 180000000  1.108-4    0.936 0.510 0000               *00085700
1802101  180010000 185000000  5.851-4    0.07  0.01  0000               *00085800
*                                                                        *00085900
1801201   3.17   0.0  0.0                                                *00086000
1802201   8.11   0.0  0.0                                                *00086100
*                                                                        *00086200
*************************************************************************00109600
*                                                                        *00109700
*  BROKEN JET PUMP SUCTION LINE                                          *00109800
2300000    C230       SNGLVOL                                           *00109900
2300101    0.003048  1.304  0.0  0.0  0.0  0.0  0.00005  0.0623  00     *00110000
2300200    3   7.29093+6   551.7   0.0                                  *00110100
*                                                                        *00110200
*************************************************************************00110300
*                                                                        *00110400
*  BROKEN JET PUMP SUCTION   ....  SMALL PUMP ASSUMED                    *00110500
2310000    C231       PUMP                                              *00110600
2310101    0.0  0.973  0.002225  0.0  -90.0  -0.073  0                  *00110700
2310108    230010000   0.003048  0.6438 0.6438 0000                     *00110800
2310109    240000000    0.000474   0.042 0.021 0000                     *00110900
2310200    3    7.39435+6   551.7   0.0                                 *00111000
2310201    1     4.94    0.0    0.0                                      *00111100
2310202    1     4.94    0.0    0.0                                      *00111200
2310301    150   150   150  -1   -1   510   1                           *00111300
2310302    376.99  0.87   0.01250 20.0   184.24  1.9  765.76           *00111400
2310303    0.0   0.0   0.0   0.0   0.0                                  *00111500
2310310    0.0   0.0   0.0                                              *00111600
*************************************************************************00112200
*                                                                        *00112300
*   BROKEN JET PUMP                                                      *00112400
*                                                                        *00112500
2400000   C240    BRANCH                                                 *00112600
*                                                                        *00112700
2400001   2     1                                                        *00112800
*                                                                        *00112900
2400101  5.851-4   0.406  0.0  0.0  -90.0  -0.406  0.00005  0.0273  00  *00113000
*                                                                        *00113100
2400200  3    7.38813+6   551.7    0.0                                   *00113200
*                                                                        *00113300
2401101  220010000 240000000  1.108-4    0.936   0.510   0000          *00113400
2402101  240010000 245000000  5.851-4    0.07    0.01    0000          *00113500
*                                                                        *00113600
2401201   3.17    0.0     0.0                                           *00113700
2402201   8.11    0.0     0.0                                           *00113800
*                                                                        *00113900
```