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International Agreement Report

Result of BETHSY Test 9.1.b Using RELAP5/MOD3

Prepared by
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The Agreement on Research Participation and Technical Exchange
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(CAMP)

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Abstract

RELAP5 computer code was used to simulate an experiment designated 9.1.b, (2" Cold Leg Break without HPSI and with Delayed Ultimate Procedure) performed on BETHSY integral test facility. This test is characterized as beyond design transients scenarios with unavailability of some safety and protection systems. The calculations which have been completed using the computer Sun Sparcstation 20 aim to evidence the difference between experimental and computed data. Generally, an agreement of major transient treads is shown to be obtained in the simulation.

Contents

List of Abbreviations III

Nomenclature III

Subscripts and Superscripts III

List of Figures IV

List of Tables IV

1 Introduction 1

2 BETHSY facility and corresponding RELAP5 input model 1

3 Results 6
3.1 Pre-test calculations of test 9.1.b (ISP-27) 6
3.2 Post-test calculations of test 9.1.b (ISP-27) 7
3.3 RELAP5/MOD3.1.2 simulation realized at Texas A&M University 14

4 Nodalization Study for BETHSY Experiment 18
4.1 Description 18

5 Run Statistics 21

6 Conclusion 21

7 References 23

Appendix A: Listing of middle BETHSY nodalization

List of Abbreviations

AFW	.....	auxiliary feedwater
DP	.....	pressure difference
DT	.....	temperature difference
IJS	.....	"Jožef Stefan" institute
ISP	.....	international standard problem
MFW	.....	main feedwater
NPP	.....	nuclear power plant
PWR	.....	pressurized water reactor
RCP	.....	reactor coolant pump
RCS	.....	reactor coolant system
SG	.....	steam generator

Nomenclature

A	....	flow area (m^2)
g	....	acceleration of gravity (m/s^2)
h	....	elevation change (m)
p	....	pressure (Pa)
v	....	velocity (m/s)
x	....	length coordinate (m)
α	....	vapour void fraction (m^3/m^3)
ρ	....	density (kg/m^3)

Subscripts and Superscripts

cold	....	in cold leg
hot	....	in hot leg

List of Figures

Figure 2.1: BETHSY facility 2
Figure 2.2: Base RELAP5 input model of BETHSY facility 3
Figure 2.3: Enlarged (detailed) RELAP5 input model of BETHSY facility 4
Figure 2.4: RCS renodalization 5
Figure 2.5: RCS and RCP renodalization 5
Figure 3.1: The influence of guide tube renodalization 9
Figure 3.2: Test 9.1.b, Pressurizer pressure 10
Figure 3.3: Test 9.1.b, No.2 SG steam dome pressure 10
Figure 3.4: Test 9.1.b, Core collapsed liquid level 10
Figure 3.5: Test 9.1.b, Core outlet steam temperature 11
Figure 3.6: Test 9.1.b, Maximum cladding temperature 11
Figure 3.7: Test 9.1.b, No.1 CL spool piece void fraction, base case 11
Figure 3.8: Test 9.1.b, No.1 CL void fraction, renod. of guide tube 12
Figure 3.9: Test 9.1.b, Break mass flow rate, base case 12
Figure 3.10: Test 9.1.b, Break mass flow rate, renod. of guide tube 12
Figure 3.11: Test 9.1.b, Secondary side mass inventory 13
Figure 3.12: Test 9.1.b, Break discharged mass 13
Figure 3.13: Test 9.1.b, Pressurizer pressure 14
Figure 3.14: Test 9.1.b, No.2 SG steam dome pressure 14
Figure 3.15: Test 9.1.b, Core collapsed liquid level 15
Figure 3.16: Test 9.1.b, Core outlet steam temperature 15
Figure 3.17: Test 9.1.b, Maximum cladding temperature 15
Figure 3.18: Test 9.1.b, No.1 CL spool piece void fraction 16
Figure 3.19: Test 9.1.b, Break mass flow rate 16
Figure 3.20: Test 9.1.b, Secondary side mass inventory 16
Figure 3.21: Test 9.1.b, Break discharged mass 17
Figure 4.1 : Steam generator nodalization for large input model 19
Figure 4.2: Maximal clad temperature calculated by RELAP5/MOD2 code. 20
Figure 4.3: Maximal clad temperature calculated by RELAP5/MOD3.1 code. 20
Figure 4.4: Maximal clad temperature calculated by RELAP5/MOD3.1.2 code. 20

List of Tables

Table 3.1: Test 9.1.b (ISP-27), initial condition 8
Table 4.1.: Three nodalizations. 18
Table 5.1.: Computational efficiency 21

1 Introduction

The objective of Jožef Stefan Institute (IJS) activities in area of RELAP5 analyses is to extend the experiences in simulations of small break loss of coolant accidents and two-phase natural circulation cooling. With an attempt to investigate all BETHSY experiments available IJS has developed its own RELAP5 model of this facility. The on BETHSY experiences based improved modelling methods will be used in simulations of real plant transients and evaluation of plant accidents management procedures.

The main goal of the calculation is the assessment of the simulation capability of the code for the following phenomena occurring during the small break LOCA experimental test, particularly for the large core uncover and fuel heat-up, requiring the implementation of an ultimate procedure.

The present analysis includes also assessment of three different versions of RELAP5 code (MOD2, MOD3.1 and MOD3.1.2 without any modification of the codes and with guidelines consideration) using experimental data of the BETHSY experiment 9.1.b (OECD-ISP-27). The goal of the comparison among different versions of RELAP5 code was to optimize CPU time and time for new model development.

The report describes the results of the calculation performed by the RELAP5/MOD3 codes and shows the comparisons with the major variables obtained in the experiment. A brief description of the BETHSY facility is provided in Section 2. Section 3 describes discusses the pre-test and post-test results, sensitivity studies are in Section 4 and run statistic is described in Section 5.

2 BETHSY facility and corresponding RELAP5 input model

BETHSY facility is located at Centre D'Etudes Nucleaires de Grenoble (France). It is a scaled down model of the three loop 2775 MWt (900 MWe) Framatome PWR power plant, which is designed to simulate most PWR accidents of interest and to study accident management procedures (Fig. 2.1).

Six important choices have been made which characterize indeed the general design of the Bethsy facility. They concern: the number of loops, the rated pressure of both the primary and the secondary side, the maximum core power level, the maximum flow rate of primary pumps, the general scaling factors and the connected circuits and systems. Volume, mass flow and power are scaled to 1/100 full plant size [1,2,3]. The correct Froude number is also maintained in the reactor coolant system (RCS) piping.

IJS RELAP5 base input model, which was developed according to the specified data, is represented on Fig. 2.2. During post test analyses this model was upgraded to the middle and large input model which is presented on figure 2.4 and 2.3 respectively. The models are described in nodalization study in Section 4.

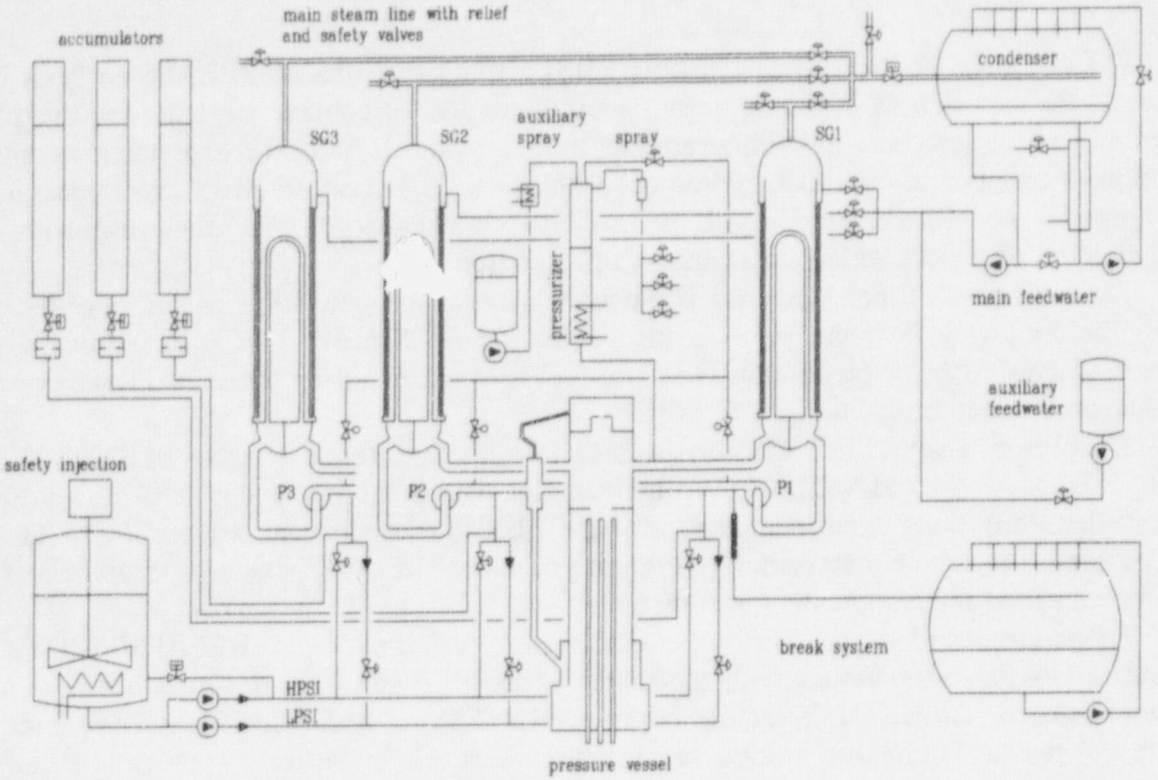

Figure 2.1: BETHSY facility

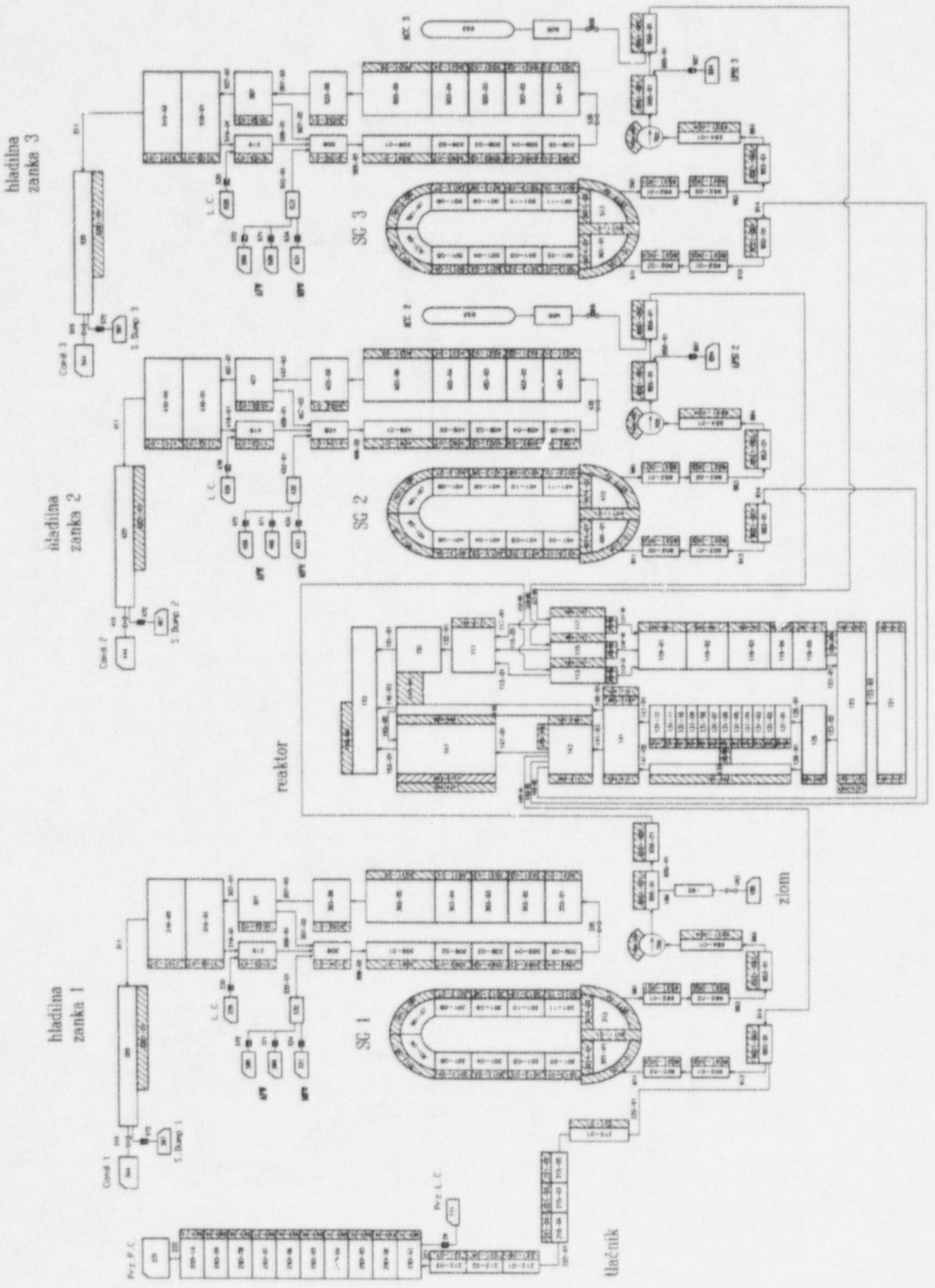

Figure 2.2: Base RELAP5 input model of BETHSY facility

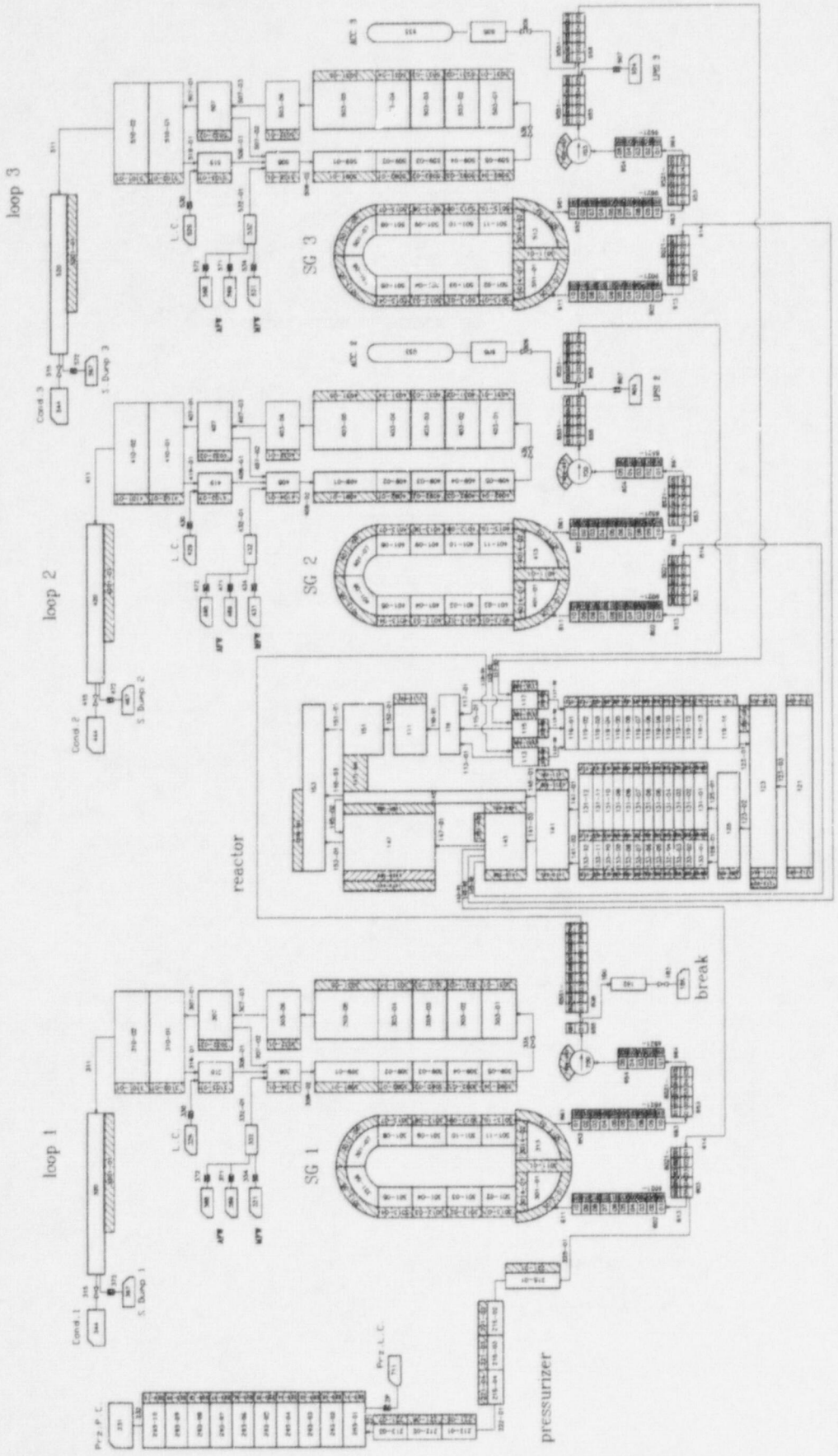

Figure 2.3: Enlarged (detailed) RELAP5 input model of BETHSY facility

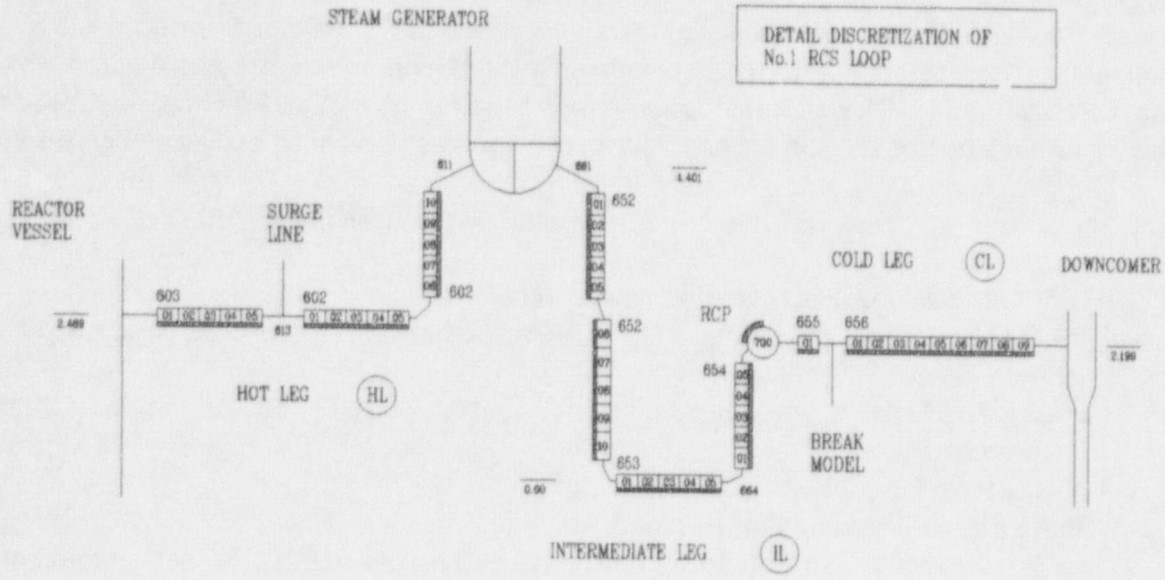

Figure 2.4: RCS renodalization (from Fig. 2.3)

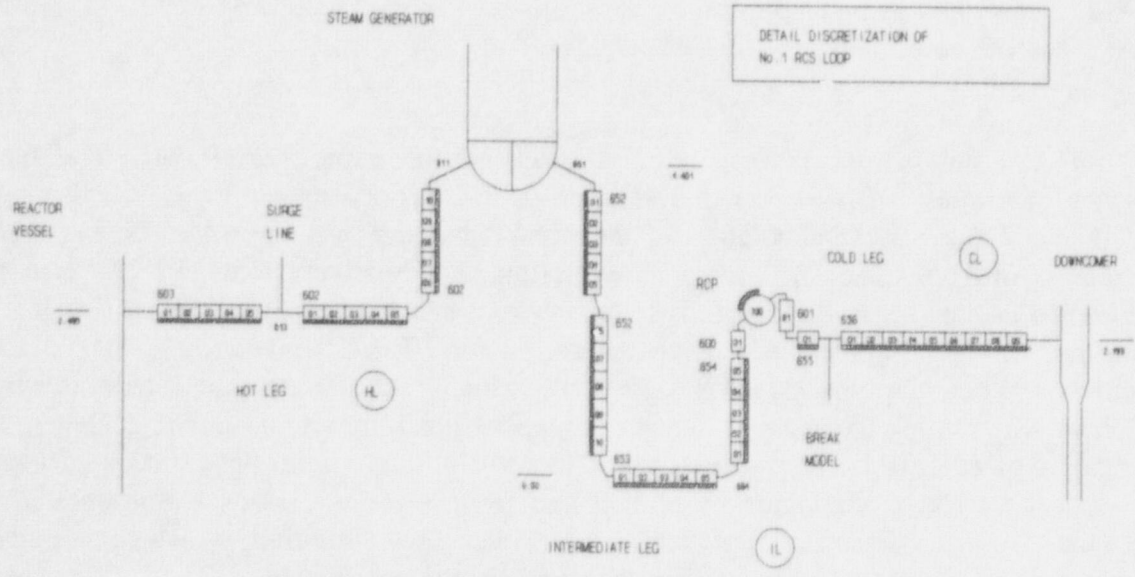

Figure 2.5: RCS and RCP renodalization (RCP renodalization not shown on Fig. 2.3)

3 Results

3.1 Pre-test calculations of test 9.1.b (ISP-27)

IJS has participated in the International Standard Problem No.27 (OECD ISP-27) based on test 9.1.b. ISP-27 transient scenario involving a scaled 2" cold led break without high pressure safety injection (HPSI) and with delayed operator action for secondary system depressurization [4]. This transient leads to a large core uncover and fuel heat-up, requiring the implementation of an ultimate procedure. The test was performed on December 19, 1989.

The scenario of the test starts at 10% nominal power (NP), the following actions are achieved:

- **t=0 s:** break opening (initiation of the transient)
- **P+P (pressurizer pressure) = 13.1 MPa:** Scram signal, the core power trip (from 10% NP) starts 17 s latter
- **P+P=11.9MPa** Safety injection signal, but no HPSI, turbine bypass and main feedwater off
- **30 s after SI signal:** Auxiliary feedwater on.
- **300 s after SI signal:** Pump coastdown
- **As the maximum core cladding temperature reaches 450°C:** Implementation of the ultimate procedure consisting in full opening of 3 steam dumps to atmosphere.
- **P+P = 4.2 MPa:** Accumulator injection starts, on the 2 intact loops only.
- **P+P = 1.5 MPa:** Accumulator isolation
- **P+P = 0.91 MPa:** LPIS injection starts, on the 2 intact loops only.
- **When stable RHRS operating condition prevail:** Core outlet fluid temperature < 177°C, P+P < 2.5 Mpa, saturation margin > 20°C, The transient is terminated.

IJS has performed blind pre-test and post-test analyses using computer codes RELAP5/MOD2.36.05 and RELAP5/MOD3.1.

The pre-test simulations correspond quite well to the experimental data. The main deficiency of pre-test analysis was the selection of the "cross" option for the break single junction. Since the correct simulation of the break flow rate was shown to be extremely important in order to determine the time evolution of a relatively long ISP-27 transient, modelling of critical break discharge was studied in post-test analyses of ISP-27 [5]. It was shown, that very good agreement between measured and RELAP5 predicted break flow can be achieved when applying suitably adjusted discharge coefficients of single junction component with abrupt area change and homogeneous junction options (junction flags). An investigation of RELAP5 critical flow prediction for discharge of strongly subcooled liquid was performed. The modification of MOD2 and MOD3 code versions was suggested to correct the erroneous departure from subcooled choked flow condition, which occurs when applying coupled abrupt area change and choking junction options [6].

Since the calculation of critical discharge through the break nozzle is strongly influenced by the break boundary condition, in IJS post-test analyses an attempt was made to improve the prediction of vapour void fraction in the broken No.1 cold leg. Some other RELAP5 participants of ISP-27 also tried to improve their predictions of RCS void distribution during post-test analyses [7,8].

3.2 Post-test calculations of test 9.1.b (ISP-27)

A wide sensitivity study to improve the RCS void distribution, which was performed by RELAP5/MOD3.1, dealt with following items:

- decrease of break discharge coefficients
- renodalization of downcomer to upper head bypass introducing the more precise description of flow path
- introduction of homogeneous option for velocity calculation in reactor head junctions
- unrealistic reduction of bypass flow area and unrealistic increase of bypass hydraulic losses
- RCS renodalization increasing the number of nodes from 9 to 45 for RCS piping (Fig. 2.4), from 1 to 12 for core bypass, and from 1 to 14 for the reactor vessel downcomer (Figs. 2.3 and 2.4)
- reduction of two-phase head and torque multipliers in RELAP5 reactor coolant pump (RCP) model
- modifications of initial condition decreasing the average RCS temperature to the lower margin of instrumentation uncertainty range (-0.5K) and increasing the RCS mass flow rate to the upper margin of instrumentation accuracy (+3%)
- increase of RCS heat losses (+20%)
- increase of secondary heat sink changing the steam generator pressure control
- renodalization of reactor coolant pumps (Fig. 2.5).

1. No above parameter or model feature was found with significant influence on vapour void fraction during the first transient phase up to the reactor coolant pumps trip. During this phase the core generated steam bubbles (saturation condition) are driven with (captured in) forced circulation flow - reactor coolant pumps remain running up to 300 seconds after the safety injection signal.

2. None of the above model modifications could essentially contribute to the reduction of No.1 cold leg vapour void fraction during second transient phase following the reactor coolant pumps trip.

In recent calculations the prediction of RCS coolant distribution was shown to be strongly dependent on modelling of the connection from guide tube to upper head: due to the misinterpretation, the annular orifice, J200 (located in guide tube), was connected to the upper plenum instead of to the upper head. The correction of this model inadequacy has improved the prediction of vapour void fraction in the broken No.1 cold leg (comparison of "base case" with "guid.renod." case on Fig. 3.1).

Furthermore, this guide tube renodalization resulted in the time shift of key transient events, which can be observed by comparing the case "RCP+guide" with the base "R5/MOD3.1" calculation on Figs. 3.2 to 3.12. Following the guide tube renodalization, the core uncover and fuel temperature rise started earlier (Figs. 3.4 and 3.6), and therefore the initiation of the "ultimate procedure" was also predicted to occur earlier (Fig. 3.11).

An additional MOD3.1 calculation is planned to be performed with vertical stratification model turned off in guide tube volumes [7,9].

In table 3.1 the measured data from experiment served as a initial conditions for BETHSY model. Data uncertainties are also provided.

Table 3.1: Test 9.1.b (ISP-27), initial condition

	measured ([2]; 10% nominal power) ± data uncertainties	BETHSY model (RELAP5/MOD3.1 initialization)
core thermal power	2864 ± 30 kW	2864 kW
cold leg temperature	559.9 ± 0.5 K	560.3 K (core inlet)
downcomer mass flow rate	150.0 ± 5.0 kg/s	154.3 kg/s
reactor coolant pump speed	2940 ± 30 rpm	2940 rpm
pressurizer pressure	155.1 ± 0.9 bar	155.1 bar
pressurizer level	4.08 ± 0.1 m	4.12 m
RCS coolant mass	1960 ± 40 kg	1948 kg
secondary side pressure	69.1 ± 0.4 bar	68.1 bar !
steam generator level (short range)	13.45 ± 0.05 m	13.45 m !
feedwater temperature	491.1 ± 2.0 K	491.0 K
secondary coolant mass (one SG)	820 ± 30 kg	821 kg !
RCS trace heating	53.5 kW	no heat losses considering the trace heating system on

! averaged for all the three steam generators

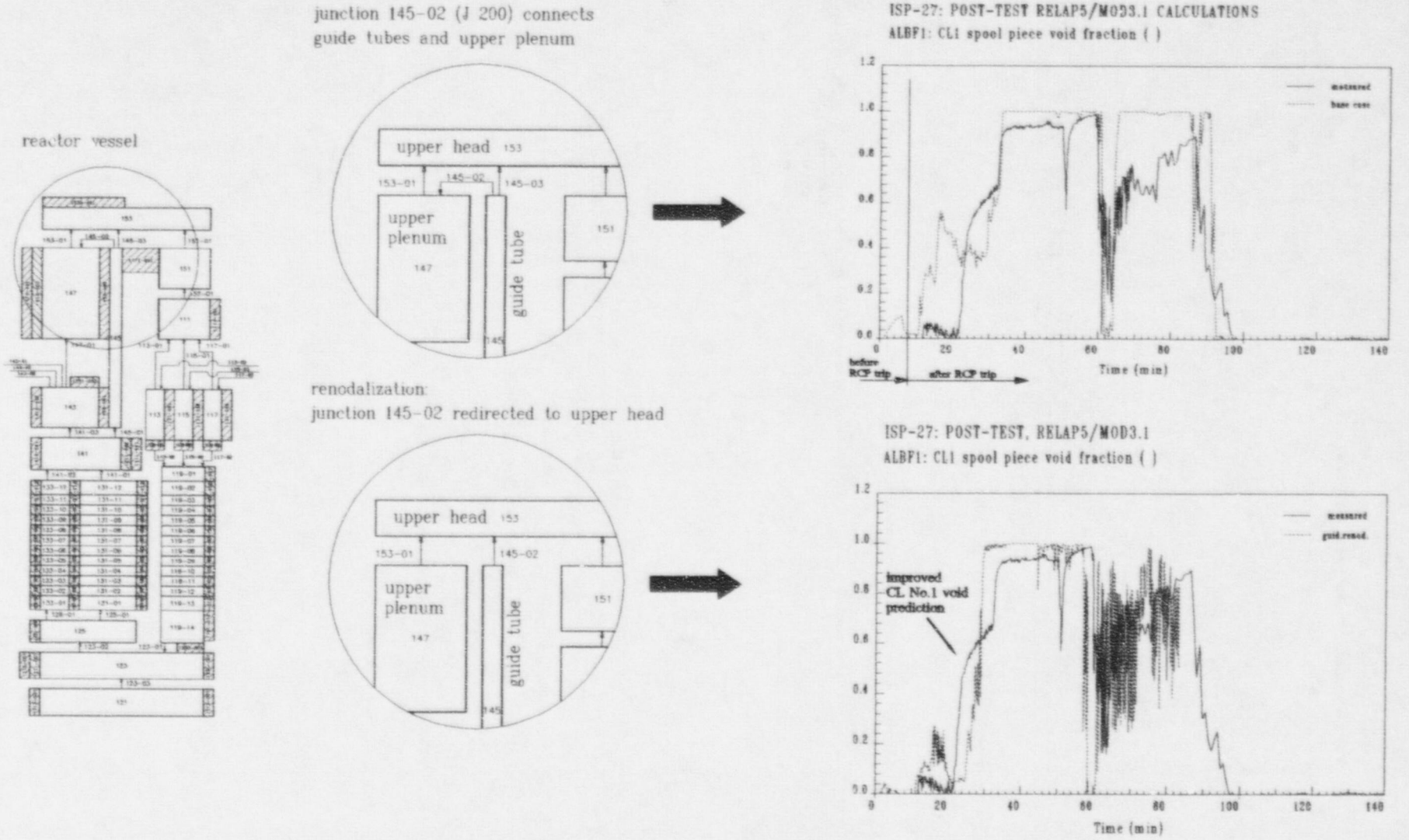

Figure 3.1: The influence of guide tube renodalization

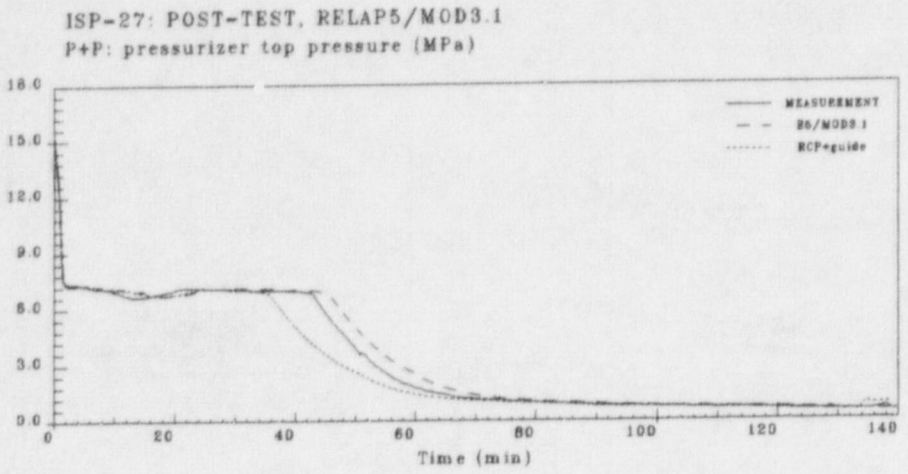

Figure 3.2: Test 9.1.b, Pressurizer pressure

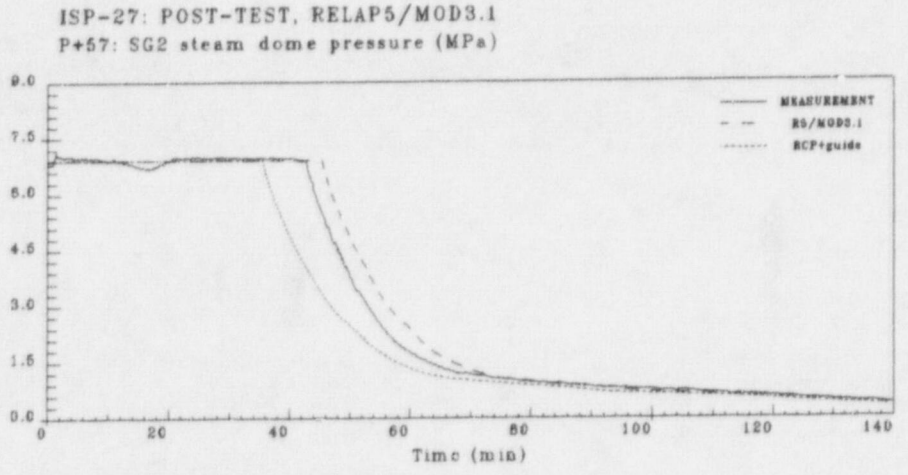

Figure 3.3: Test 9.1.b, No.2 SG steam dome pressure

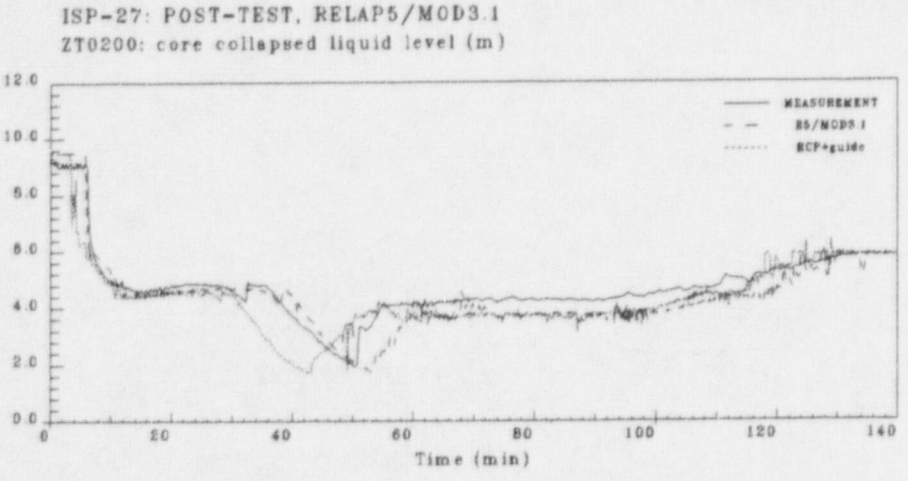

Figure 3.4: Test 9.1.b, Core collapsed liquid level

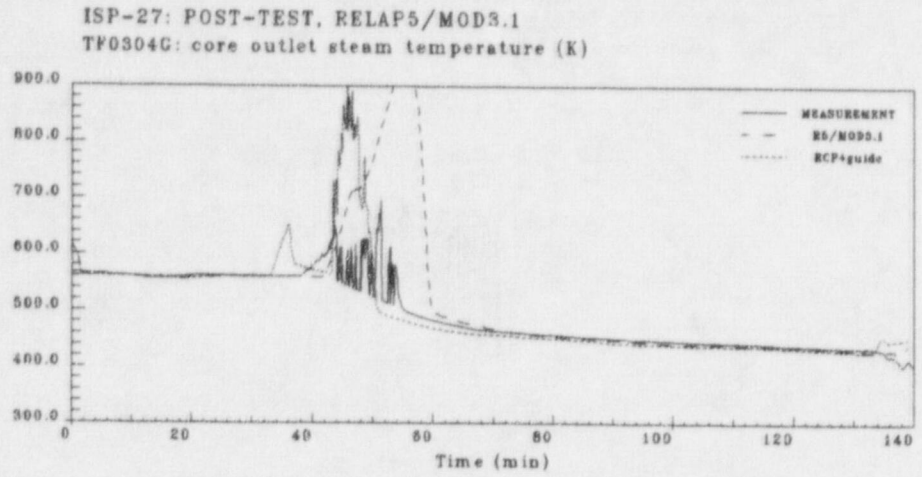

Figure 3.5: Test 9.1.b, Core outlet steam temperature

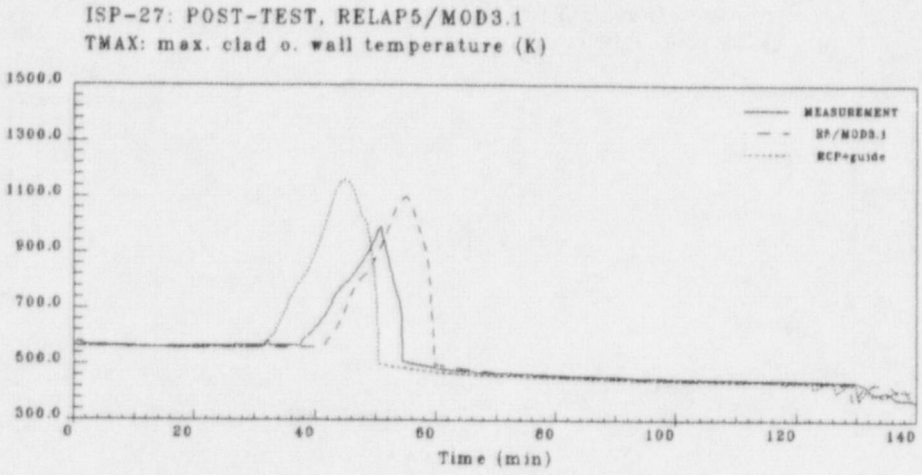

Figure 3.6: Test 9.1.b, Maximum cladding temperature

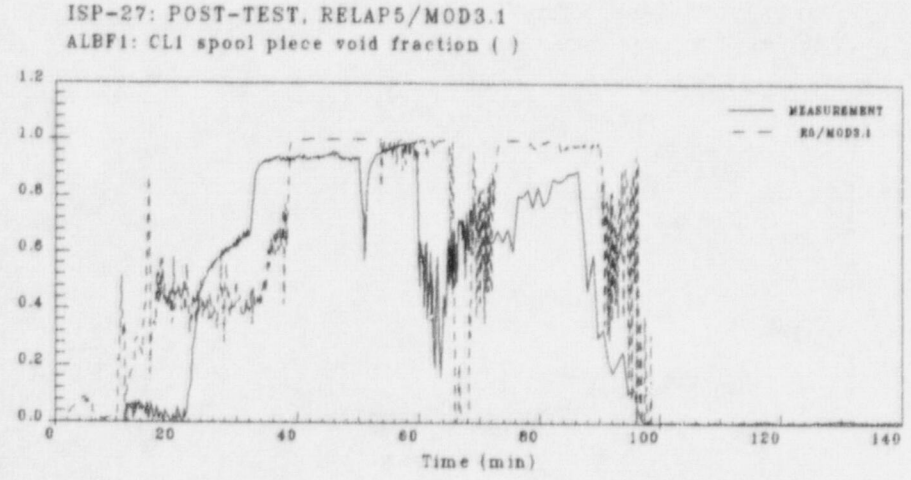

Figure 3.7: Test 9.1.b, No.1 CL spool piece void fraction, base case

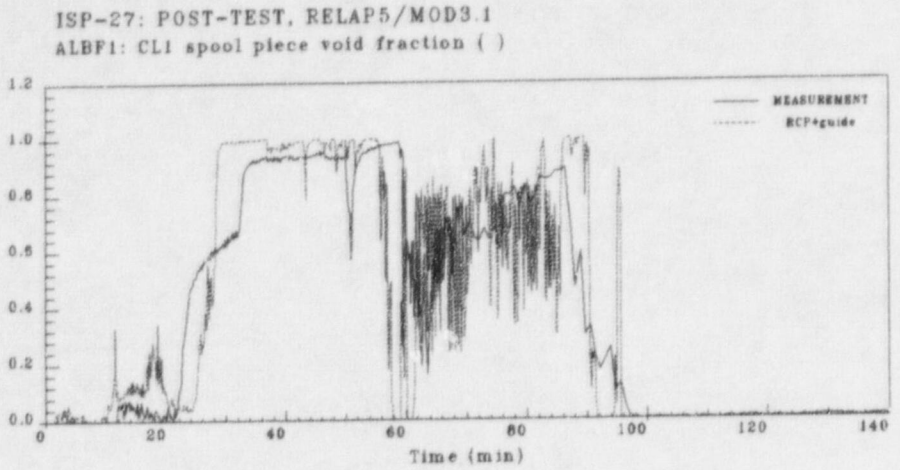

Figure 3.8: Test 9.1.b, No.1 CL void fraction, renod. of guide tube

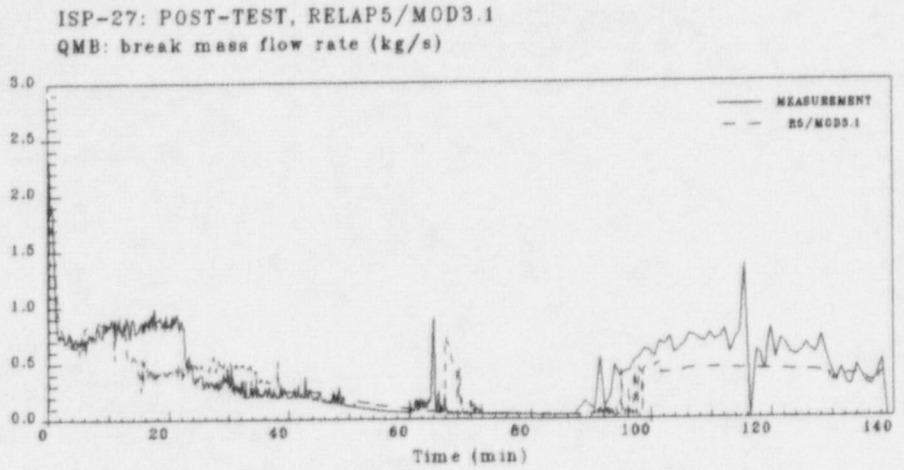

Figure 3.9: Test 9.1.b, Break mass flow rate, base case

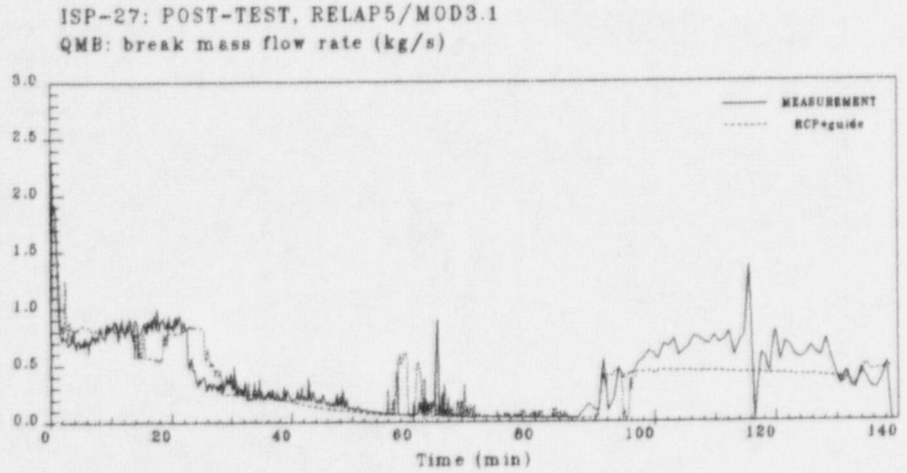

Figure 3.10: Test 9.1.b, Break mass flow rate, renod. of guide tube

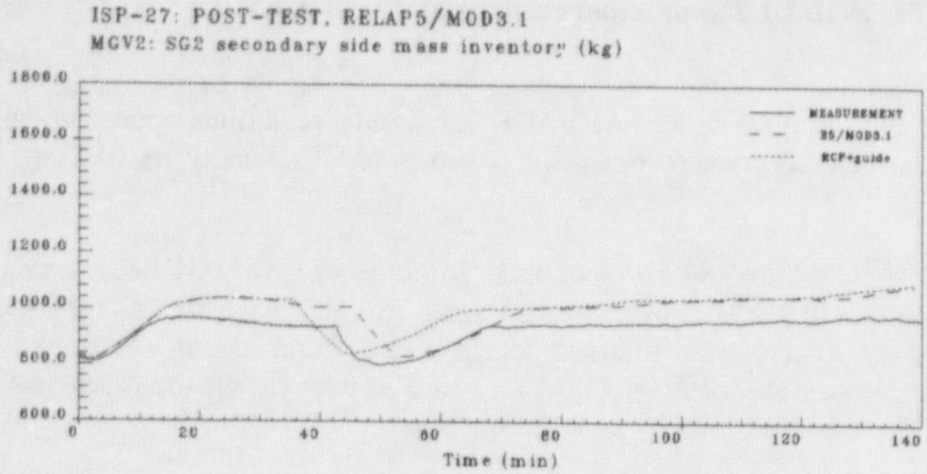

Figure 3.11: Test 9.1.b, Secondary side mass inventory

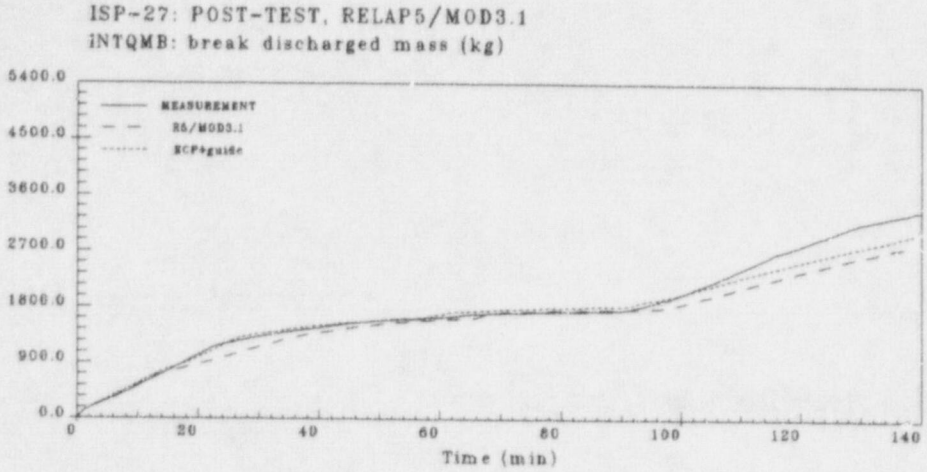

Figure 3.12: Test 9.1.b, Break discharged mass

3.3 RELAP5/MOD3.1.2 simulation realized at Texas A&M University

The time shift problem of RELAP5/MOD3.1 simulation did not appear in the last ISP-27 calculation, which has been performed at Texas A&M University by RELAP5/MOD3.1.2 code.

Base IJS input deck and restart input decks from the RELAP5/MOD3.1 simulation of ISP-27 have been sent to A&M University for testing on a RELAP5/MOD3.1.2 simulation. The results of the test have been returned to IJS and the conclusion was drawn that all the transient differences observed on Figs. 3.13 to 3.21 comparing the cases "MOD3.1" and "MOD3.1.2" are caused only by code differences.

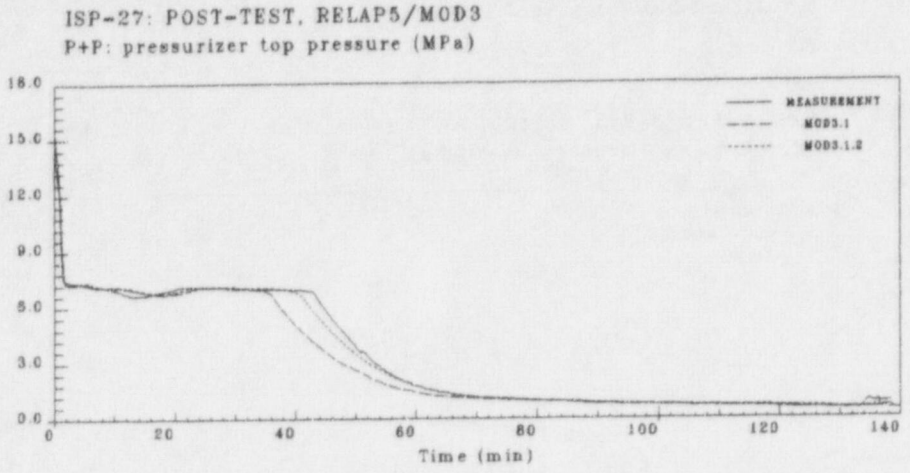

Figure 3.13: Test 9.1.b, Pressurizer pressure

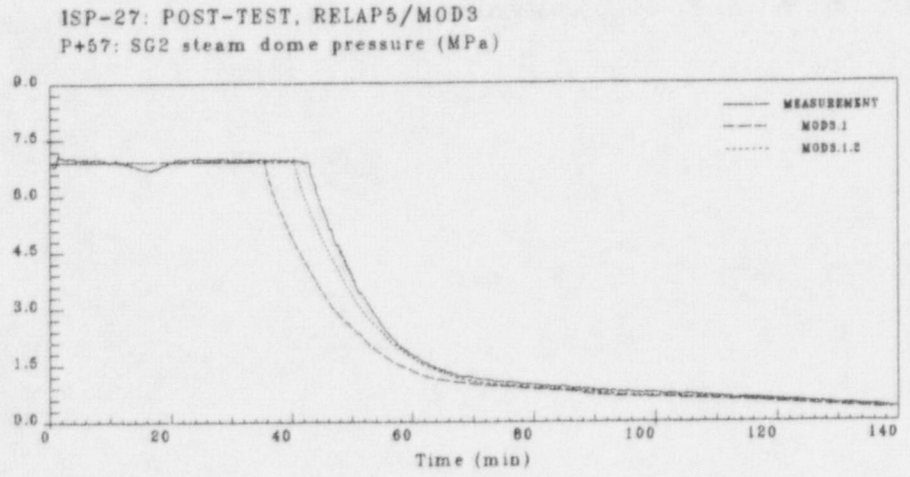

Figure 3.14: Test 9.1.b, No.2 SG steam dome pressure

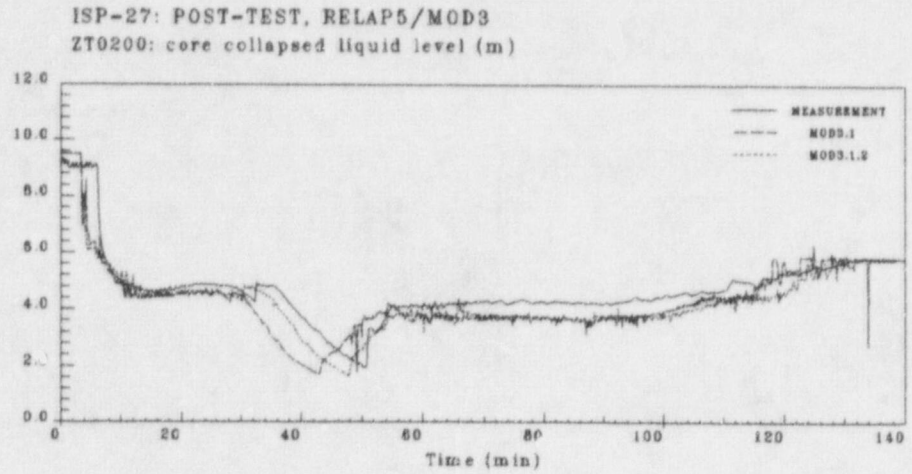

Figure 3.15: Test 9.1.b, Core collapsed liquid level

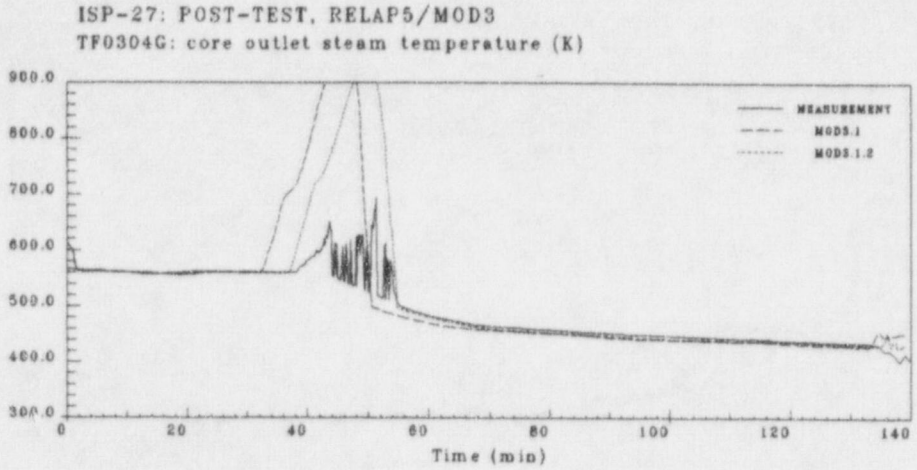

Figure 3.16: Test 9.1.b, Core outlet steam temperature

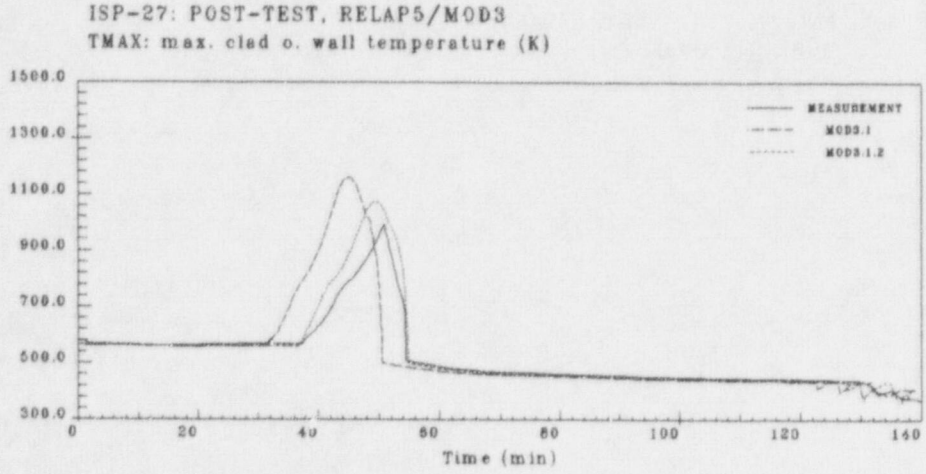

Figure 3.17: Test 9.1.b, Maximum cladding temperature

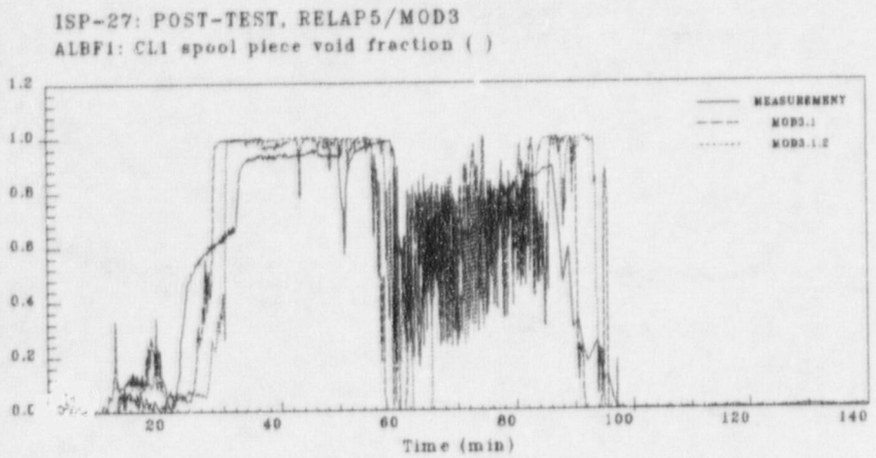

Figure 3.18: Test 9.1.b, No.1 CL spool piece void fraction

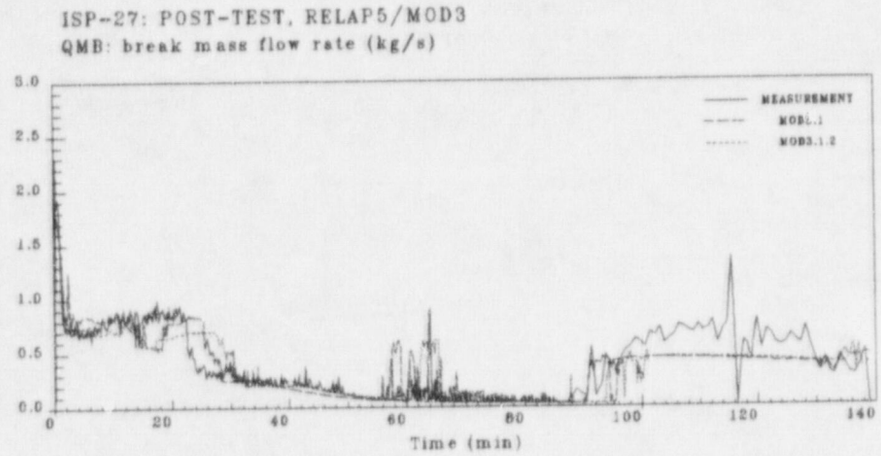

Figure 3.19: Test 9.1.b, Break mass flow rate

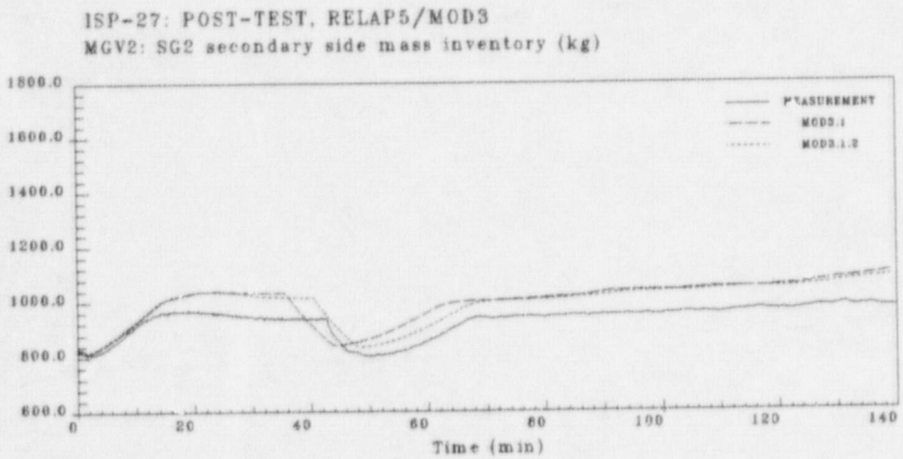

Figure 3.20: Test 9.1.b, Secondary side mass inventory

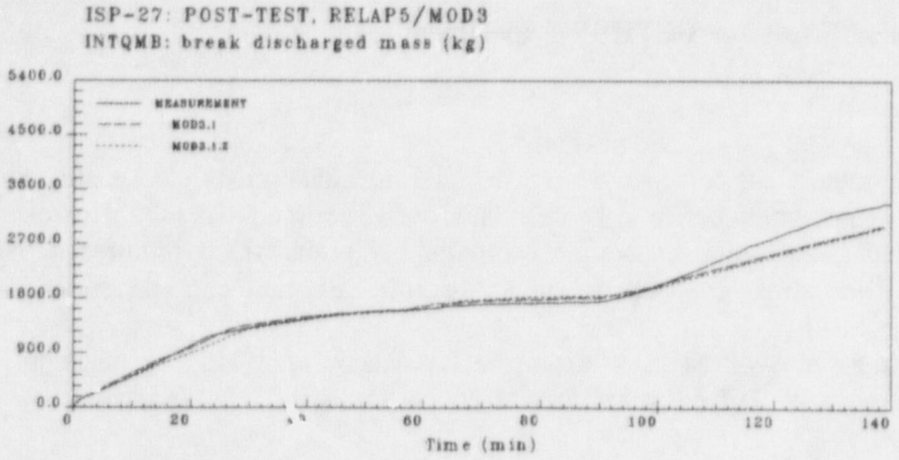

Figure 3.21: Test 9.1.b, Break discharged mass

4 Nodalization Study for BETHSY Experiment

4.1 Description

Some authors suggest that a more detailed nodalization should be utilized in order to achieve better agreement between the calculated and experimental results. However, sometime more detailed nodalization causes an oscillatory solution which requires a much smaller currant and computing time step. In such situations CPU time can become excessive.

A comparison of existing experimental data of BETHSY experiment 9.1.b with simulation results of RELAP5/ MOD2, MOD3.1 and MOD3.1.2 is made.

The IJS RELAP5/MOD2 input model was developed and initialized according to the specified data for each test. Each of the three coolant loops is represented explicitly without taking into account the small asymmetry between the loops. This base input (Fig. 2.2) consisted of 196 volumes, 207 junctions, 191 heat structures, 125 control variables and 13 trips. On this base RELAP5/MOD2 input model was further upgraded to RELAP5/MOD3.1 and RELAP5/MOD3.1.2. During post-test analyses, the base input model was renodalized, increasing the number of nods in reactor coolant system pipping, reactor coolant pumps, core bypass section and reactor vessel downcomer. The elevations of parallel volumes of the reactor downcomer in bypass reactor core, hot leg and cold leg were preserved. Nodalization of the reactor core, pressurizer, steam generators, reactor head, upper plenum and lower plenum remained the same for middle input which is presented in figure 2.4. Further, middle RELAP5 model was again upgraded, increasing the number of nods only in steam generator. The detailed RELAP5 model of BETHSY facility contains 332 volumes, 343 junctions and 330 heat structures (Figs. 2.3, 2.4, 2.5). All three inputs based on different nodalization should represent the same situation using different computer codes. These were assured with strict consideration of RELAP5 code manuals. Table 4.1. presents number of volumes, junctions, heat structures and mesh points for various inputs nodalization [10].

The comparison of experimental data with simulation results concentrated on only a few important variables such as cold leg no#1 spool piece void fraction, maximal clad temperature, core collapsed liquid level and break mass flow rate [11,12,13].

Table 4.1.: Three nodalizations.

Nodalizations	Volumes	Junctions	Heat Str./M.P.
Small Input	196	207	191/754
Middle Input	332	343	330/1290
Large Input	398	408	396/1554

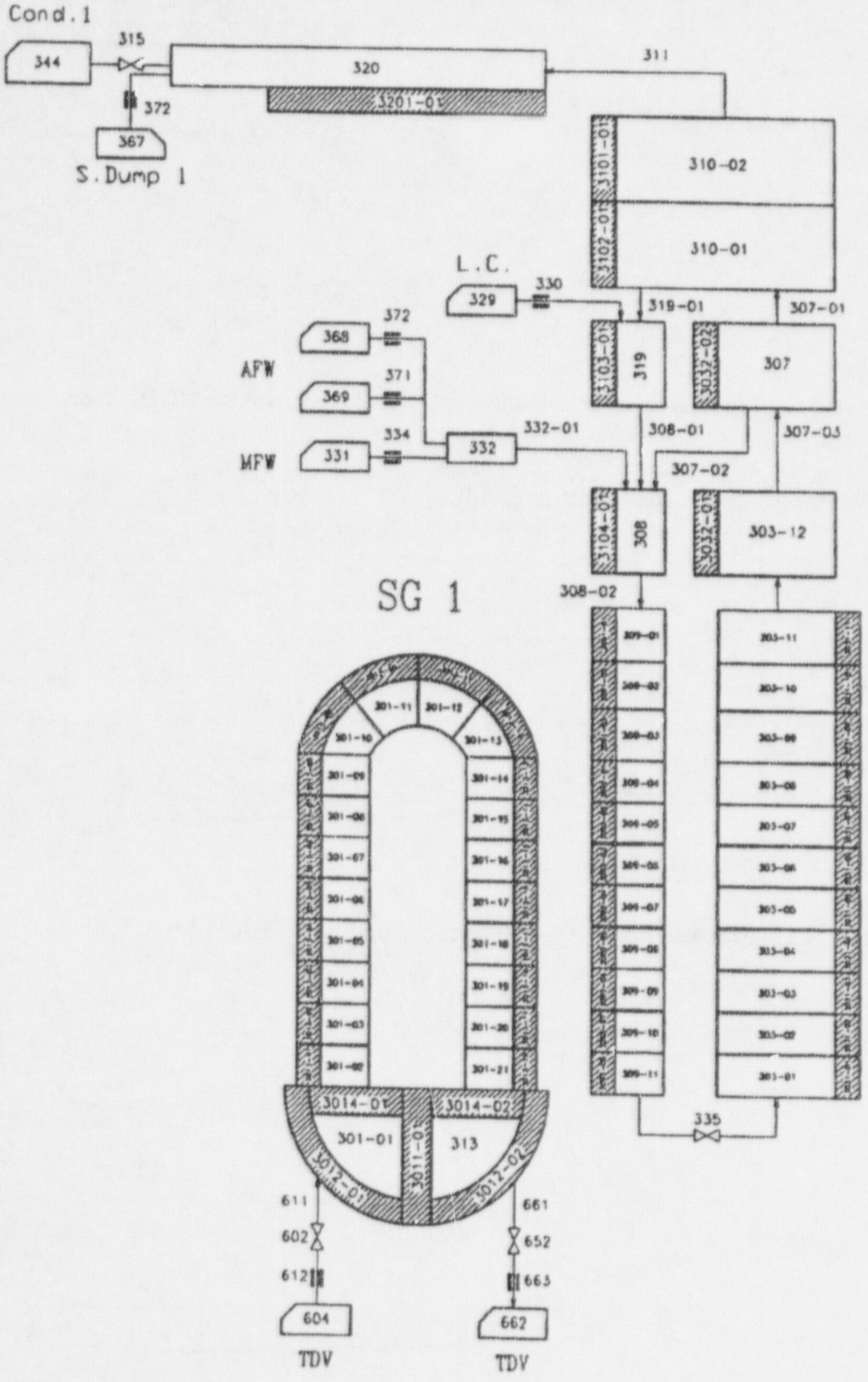

Figure 4.1: Steam generator nodalization for large input model

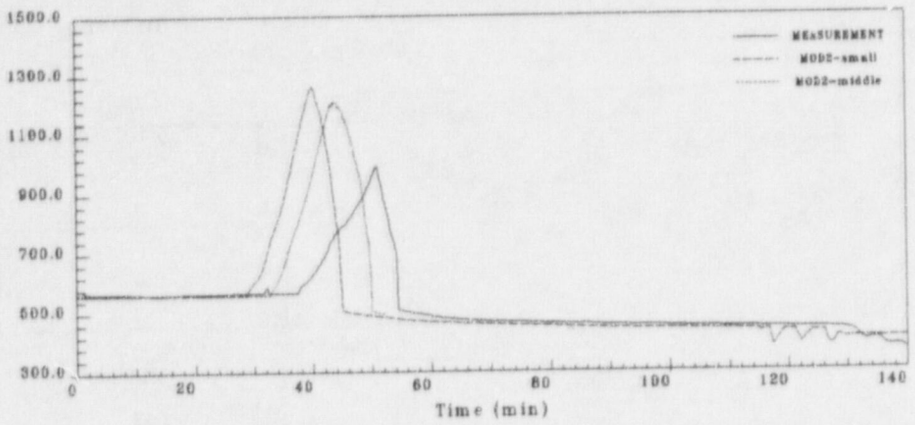

Figure 4.2: Maximal clad temperature calculated by RELAP5/MOD2 code.

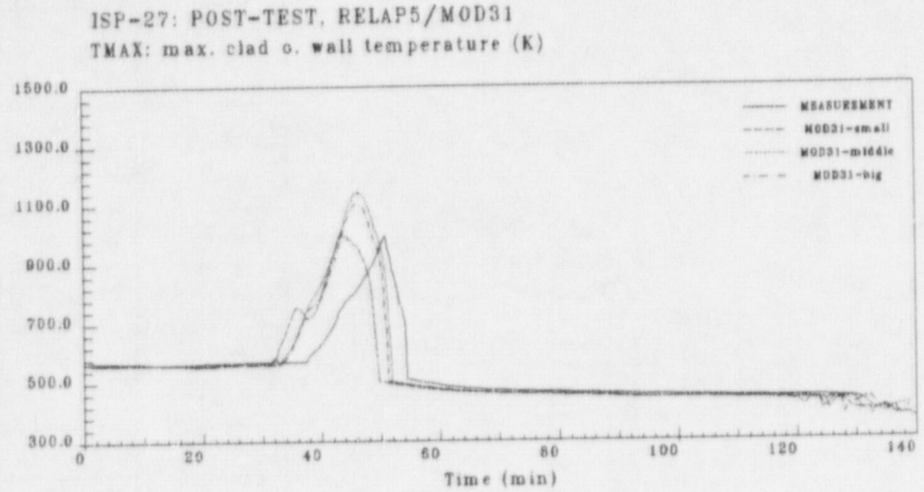

Figure 4.3: Maximal clad temperature calculated by RELAP5/MOD3.1 code.

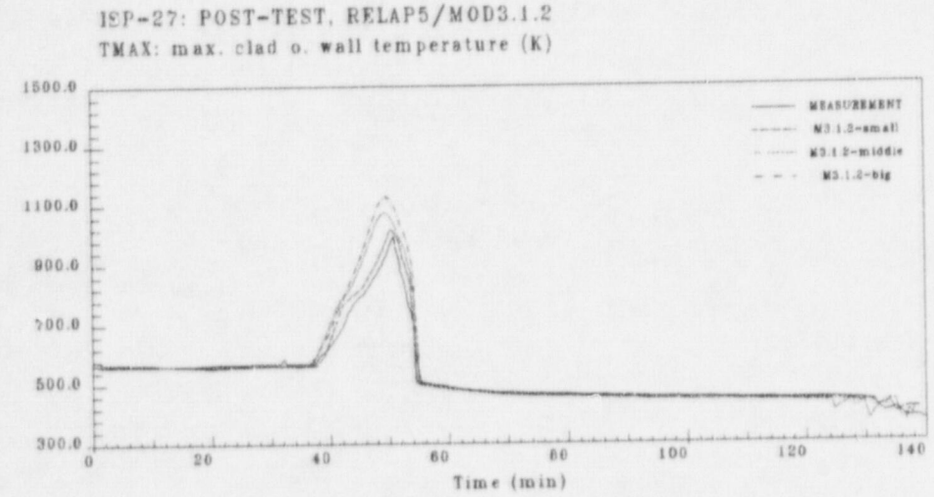

Figure 4.4: Maximal clad temperature calculated by RELAP5/MOD3.1.2 code.

5 Run Statistics

The original RELAP5/MOD3.1 code with no modifications and with guidlines consideration was used. Calculations were done on Sun Sparcstation 20 (4 processor workstation) which uses multiuser and multitasking operating system SOLARIS 2.5.

The time step was limited at 1.0E-6 as a minimum time step and 2.0E-2 as a maximum time step. During the calculation the thermodynamic property error (liquid phase property error) at time 4119.642 sec. Therefore, restart calculation with the reduced maximum time step of 1.0E-4 was applied for the next 50 seconds to overcome this.

The computational efficiency for middle nodalization (Table 4.1) is summarized in Table 5.1 14

Table 5.1.: Computational efficiency

Calculation	Computer Time (CPU), sec	Number of time Step (DT)	Number of volume (N)	Grind Time CPU/(N*DT)
RELAP5/MOD3	72064 sec	491413	332	0.00044

Listing of the base input model and restart one are in Appendix A.

6 Conclusion

RELAP5/MOD3.1 computer code was used to simulate experiment performed on BETHSY integral test facility (dealing with small break loss of coolant accidents). The main discrepancies between the simulations presented and the measured data were found to be connected with the predictions of critical discharge, collapsed core liquid level and loop seal clearance phenomena. It should be noted that the reasons for all the problems encountered are not yet well understood.

The wide RELAP5/MOD3.1 sensitivity study, which was performed to improve the prediction of RCS void distribution for test 9.1.b (ISP-27), succeeded with the correction of an input model inadequacy: the orifice J200 (located in guide tube) has been connected to the upper plenum instead of to the upper head. Following this error correction, the prediction of vapour void fraction in broken No.1 cold leg was improved. Especially good agreement with experimental data was achieved in the last ISP-27 simulation which was performed by RELAP5/MOD3.1.2 code version at Texas A&M University.

In general, we found that a more detailed nodalization may lead to more accurate prediction of void fraction but it also may lead to less accurate prediction of other variables, for example maximal clad temperature (figures 2.2 through 2.4).
More detailed nodalization may also lead to an oscillatory solution which needs a very small time step and therefore extensive CPU time. Such calculations can be very sensitive to certain control volumes with regard to numerical stability resulting water property error.
Further, we found that for the most parameters and control variables there are no essential differences between the results of the more detailed and less detailed nodalizations.
Comparison of the results of MOD2, MOD3.1 and MOD3.1.2 shows that in general the best

results are obtained from MOD3.1.2. This version of RELAP5 code seams to be less sensitive on users affects. What means that different manner of modelling the same flow path are no more so sensitive.

The participation in BETHSY program provided additional knowledge which is needed for good understanding of RCS phenomena during SB LOCA (e.g. RELAP5 simulation of DP measurements observing the loop seal clearance phenomena). Further comparison of existing experimental data with simulation results will lead to the modifications and improvements of developed input models of experimental facilities and real plants. Experiences gained in analyses of BETHSY experiments will also be used in simulations of real plant transients which consider similar transient scenarios. Furthermore, IJS analyses also aim to answer some basic questions concerning the effect on two-phase flows of scaling a commercial nuclear plant down to the size of experimental facilities.

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APPENDIX A

Listing of the middle BETHSY nodalization

- base input
- restart input

Appendix A - Listing of the middle BETSY nodalization - base input

```
* bethsy - standardni eksperiment: po 5.3.1991
* relap5/mod3
*
*  posttestni komentarji:
*
*  podrobnejsa diskretizacija primarnih cevovodov
*  tudi podrobnejsa diskretizacija toplotnih teles na RCS
cevovodih
*     (trace-heating so sicer ugasnili sele po vbrizgu
akumulatorjev v 86.min)
*  s korekcijo: vseh ISP-27 DP tlacnih zaznaval po
renodalizaciji RCS (R+)
*                vseh ISP-27 VOIDG senzorjev po renodalizaciji
RCS (R+)
*
*  RCP+   : dh renodalizacija RCP (1->3 vol.)
*  R+     : komentar najpomembnejsih dodatnih sprememb na 5x
gostejsi mrezi
*  ++++   : iz nbam3.dat je vzet realisticni model bypassa v
glavo reaktorja
*  fff    : spremembe flagov spojev v glavi reaktorja iz 3-
centrally na 1-upward
*  bbb    : renod. obtoka 133 (1->12 vol. in pipe(119,131,133)
fvcahs v:3->0)
*  ddd    : renod. downcomerja 119 (5->14 vol., elevacije
ustrezno sredici 131)
*  ggg    : spoj 145-03 (j200) prenesen na mesto 145-02 (j21)
*
*  tokrat nobenih poizkusov s homogeno glavo!
*
* * !@ : znizanje Tcold reference s 560.35 K (+0.5 K) na 559.35
K (-0.5 K)
* * !$ : povecanje mRCS na zgornjo tolerancno mejo 150 kg/s ->
155 kg/s
* ff11 : potrebni izklop inicializacije toplotnega telesa
*
*******************************************************************
*********
*
*  rrxx, rrxxcc   :  reaktorska posoda, rx ctv blok
*  ssgg, ssggcc   :  uparjalnik, sg ctv blok
*  rrcc, rcp-     :  primarni cevovod, crpalka
*  pprrzz, sline  :  tlacnik, prelivni vod
*  mmff, ss11     :  glavno napajanje, parovod
*  11pp           :  lpsi in akumulatorji
*  aaff, zz11     :  pomozno napajanje in steam dump, cl1 zlom
*  hhss, hh11     :  blok toplotnih teles, model toplotnih izgub
*  ccc, ccci      :  regulacijski sistem, reg. sistem za
inicializacijo
*  ccvv, ccvvii   :  blok kontrolnih spremenljivk, b.k.s. za
inicializacijo
*  ttrr           :  blok tripov
*  ddhh           :  dh korskcija tlacnih zaznaval
*
*  predtestni komentarji:
*
*  ++             :  opozorilo ali pomanjkljivost
*  *!             :  uglasitev dp hidravlicnih izgub
*  kkk            :  komentar
*
*******************************************************************
*********
*
100  new  transnt     * 0 ... z izpisom
* 100  new  stdy-st
* 101  inp-chk
*
110  nitrogen
120  121010000  0.0      h2o  prim
121  303010000  9.912    h2o  sek1
122  403010000  9.912    h2o  sek2
123  503010000  9.912    h2o  sek3
*
201  200.0  1.0-6  0.1   3   100  1000  1000
*
*
*******************************************************************
**********
** mmee                minor edit - initialization
*
*******************************************************************
**********
**
** rx
*301  cntrlvar  102          * reactor vessel inventory mass
[kg]
*302  cntrlvar  120          * total core power [kw]
*303  cntrlvar  110          * core level [m]
*304  cntrlvar  111          * reactor vessel level [m]
*305  mflowj    123010000    * rx downcomer mass flow [kg/s]
**
*306  mflowj    180000000    * cl1 break mass flow [kg/s]
**
** prz
*307  p         203100000    * prz pressure [pa]
*308  cntrlvar  203          * prz level [m]
*309  q         203010000    * heater power [w]
**
** rcs - loop 1
*310  tempf     602010000    * loop 1 thot [k]
*311  tempf     655010000    * loop 1 tcold [k]
*312  mflowj    611000000    * loop 1 loop mass flow [kg/s]
*313  pmpvel    701          * loop 1 pump speed [rad/s]
**
** rcs - loop 2
*314  tempf     802010000    * loop 2 thot [k]
*315  tempf     855010000    * loop 2 tcold [k]
*316  mflowj    811000000    * loop 2 loop mass flow [kg/s]
*317  pmpvel    702          * loop 2 pump speed [rad/s]
*318  mflowj    806000000    * accum. 2 mass flow [kg/s]
*319  mflowj    807000000    * lpsi 2 mass flow [kg/s]
**
** rcs - loop 3
*320  tempf     902010000    * loop 3 thot [k]
*321  tempf     955010000    * loop 3 tcold [k]
*322  mflowj    911000000    * loop 3 loop mass flow [kg/s]
*323  pmpvel    703          * loop 3 pump speed [rad/s]
*324  mflowj    906000000    * accum. 3 mass flow [kg/s]
*325  mflowj    907000000    * lpsi 3 mass flow [kg/s]
**
**  sg 1
*331  p         310010000    * sg 1 pressure [pa]
*332  mflowj    311000000    * sg 1 steam flow [kg/s]
*333  cntrlvar  305          * sg 1 sec. mass [kg]
*334  cntrlvar  303          * sg 1 downcomer level [m]
*335  mflowj    335000000    * sg 1 recirculation mass flow
[kg/s]
*336  mflowj    334000000    * mfw 1 mass flow - constant [kg/s]
*337  mflowj    332010000    * total feed1 flow [kg/s]
*338  mflowj    372000000    * steam dump 1 flow [kg/s]
**
**  sg 2
*341  p         410010000    * sg 2 pressure [pa]
*342  mflowj    411000000    * sg 2 steam flow [kg/s]
*343  cntrlvar  405          * sg 2 sec. mass [kg]
*344  cntrlvar  403          * sg 2 downcomer level [m]
*345  mflowj    435000000    * sg 2 recirculation mass flow
[kg/s]
*346  mflowj    434000000    * mfw 2 mass flow - constant [kg/s]
*347  mflowj    432010000    * total feed2 flow [kg/s]
*348  mflowj    472000000    * steam dump 2 flow [kg/s]
**
**  sg 3
*351  p         510010000    * sg 3 pressure [pa]
*352  mflowj    511000000    * sg 3 steam flow [kg/s]
*353  cntrlvar  505          * sg 3 sec. mass [kg]
*354  cntrlvar  503          * sg 3 downcomer level [m]
*355  mflowj    535000000    * sg 3 recirculation mass flow
[kg/s]
*356  mflowj    534000000    * mfw 3 mass flow - constant [kg/s]
*357  mflowj    532010000    * total feed3 flow [kg/s]
*358  mflowj    572000000    * steam dump 3 flow [kg/s]
**
*360 cntrlvar   235          * heat losses
**
**
*******************************************************************
**********
**
** prz:
*388  mflowj    232000000    * umprz flow
*389  mflowj    712000000    * umchar flow
**
** sg:
*390  cntrlvar  300          * 11 delta tcold
*391  cntrlvar  324          * sg 1 recirculation control
*392  mflowj    330000000    * mfw 1 mass flow - sg level
control
**
*393  cntrlvar  400          * 12 delta tcold
*394  cntrlvar  424          * sg 2 recirculation control
*395  mflowj    430000000    * mfw 2 mass flow - sg level
control
**
*396  cntrlvar  500          * 13 delta tcold
*397  cntrlvar  524          * sg 3 recirculation control
*398  mflowj    530000000    * mfw 3 mass flow - sg level
control
**
**
**
*******************************************************************
**********
** mmee                  requested minor edit
*
```

```
*************************************************************
**********
**
*301  voidg     603030000  * albc1: hl1 spool piece void
fraction [ ] R+
*302  voidg     656070000  * albf1: cl1 spool piece void
fraction [ ] R+
*303  voidg     803030000  * albc2: hl2 spool piece void
fraction [ ] R+
*304  voidg     856070000  * albf2: cl2 spool piece void
fraction [ ] R+
*305  voidg     903040000  * albc3: hl3 spool piece void
fraction [ ] R+
*306  voidg     956070000  * albf3: cl3 spool piece void
fraction [ ] R+
**
**++  dp = p(low press. tap) - p(high press. tap)
**
*307  cntrlvar  240        * dp0200   : core heat. length diff.
press. [kpa]
*308  cntrlvar  241        * dpup1    : upper plenum diff.
press. [kpa]
*309  cntrlvar  242        * dp034    : guide tube dif. press.
[kpa]
*310  cntrlvar  243        * dpuhead  : upper head dif. press.
[kpa]
*311  cntrlvar  244        * dp050    : downcommer to upp. head
dif. p. [kpa]
*312  cntrlvar  245        * dp0r1    : pressure vessel dif.
press. [kpa]
**
*313  cntrlvar  246        * dp1      : cl1 to hl1 diff. press.
[kpa]
*314  cntrlvar  247        * dp12pg   : pump 1 diff. press.
[kpa]
*315  cntrlvar  248        * dp12vg   : loop seal 1 downf. side
diff. p. [kpa]
*316  cntrlvar  249        * dp12vp   : loop seal 1 upflow. side
diff. p. [kpa]
**
*317  cntrlvar  250        * dp2      : cl2 to hl2 diff. press.
[kpa]
*318  cntrlvar  251        * dp22pg   : pump 2 diff. press.
[kpa]
*319  cntrlvar  252        * dp22vg   : loop seal 2 downf. side
diff. p. [kpa]
*320  cntrlvar  253        * dp22vp   : loop seal 2 upflow. side
diff. p. [kpa]
**
*321  cntrlvar  254        * dp3      : cl3 to hl3 diff. press.
[kpa]
*322  cntrlvar  255        * dp32pg   : pump 3 diff. press.
[kpa]
*323  cntrlvar  256        * dp32vg   : loop seal 3 downf. side
diff. p. [kpa]
*324  cntrlvar  257        * dp32vp   : loop seal 3 upflow. side
diff. p. [kpa]
**
*325  cntrlvar  258        * dp4      : sg1 u-tube in. to outlet
diff. p. [kpa]
*326  cntrlvar  259        * dp41     : sg1 inlet plenum diff.
press. [kpa]
*327  cntrlvar  260        * dp426    : sg1 u-tube upflow side
diff. p. [kpa]
*328  cntrlvar  261        * dp4r2    : sg1 boiler section diff.
press. [kpa]
**
*329  cntrlvar  262        * dp5      : sg2 u-tube in. to outlet
diff. p. [kpa]
*330  cntrlvar  263        * dp51     : sg2 inlet plenum diff.
press. [kpa]
*331  cntrlvar  264        * dp526    : sg2 u-tube upflow side
diff. p. [kpa]
*332  cntrlvar  265        * dp5r2    : sg2 boiler section diff.
press. [kpa]
**
*333  cntrlvar  266        * dp6      : sg3 u-tube in. to outlet
diff. p. [kpa]
*334  cntrlvar  267        * dp61     : sg3 inlet plenum diff.
press. [kpa]
*335  cntrlvar  268        * dp626    : sg3 u-tube upflow side
diff. p. [kpa]
*336  cntrlvar  269        * dp6r2    : sg3 boiler section diff.
press. [kpa]
**
*337  cntrlvar  270        * dpp1     : pressurizer diff. press.
[kpa] *++
**
*338  cntrlvar  271        * intqmb   : time integrated break
mass flow [kg]
*339  cntrlvar  274        * intqmsi  : time integrated lpsi
mass flow [kg]
*340  cntrlvar  305        * mgv1     : sg1 secondary side mass
invet. [kg]
*341  cntrlvar  405        * mgv2     : sg2 secondary side mass
invet. [kg]
*342  cntrlvar  505        * mgv3     : sg3 secondary side mass
invet. [kg]
*343  cntrlvar  275        * msm2     : accumulator 2 mass
invetory [kg]
*344  cntrlvar  276        * msm3     : accumulator 3 mass
invetory [kg]
**
*345  cntrlvar  277        * p+47     : sg1 steam dome pressure
[mpa]
*346  cntrlvar  278        * p+57     : sg2 steam dome pressure
[mpa]
*347  cntrlvar  279        * p+67     : sg3 steam dome pressure
[mpa]
*348  cntrlvar  280        * p+p      : pressurizer top pressure
[mpa]
*349  cntrlvar  281        * p+sm2    : accumulator 2 gas phase
pressure [mpa]
*350  cntrlvar  282        * p+sm3    : accumulator 3 gas phase
pressure [mpa]
**
*351  mflowj    123010000  * qm05     : downcomer mass flow rate
[kg/s]
*352  mflowj    332010000  * qman31   : sg1 feedwatcr mass flow
rate [kg/s]
*353  mflowj    432010000  * qman32   : sg2 feedwater mass flow
rate [kg/s]
*354  mflowj    532010000  * qman33   : sg3 feedwater mass flow
rate [kg/s]
*355  mflowj    180000000  * qmb      : break mass flow rate
[kg/s]
*356  mflowj    311000000  * qmgv11   : sg1 steam line mass flow
rate [kg/s]
*357  mflowj    411000000  * qmgv12   : sg2 steam line mass flow
rate [kg/s]
*358  mflowj    511000000  * qmgv13   : sg3 steam line mass flow
rate [kg/s]
*359  mflowj    807000000  * qmsb12   : lpsi in cl2 mass flow
rate [kg/s]
*360  mflowj    907000000  * qmsb13   : lpsi in cl3 mass flow
rate [kg/s]
**
*361  cntrlvar  283        * sebreak  : break specific enthalpy
[kj/kg]
**
*362  tempf     123010000  * tf012a   : core inlet temperature
[k]
*363  tempf     141010000  * tf0304   : core outlet temperature
[k]
*364  tempf     151010000  * tf041    : upper head (bottom)
temperature [k]
*365  tempf     153010000  * tf042    : upper head (top)
temperature [k]
*366  tempf     602010000  * tf112    : hot leg 1 temperature
[k]
*367  tempf     656050000  * tf133    : cold leg 1 temperature
[k]  * R+
*368  tempf     803010000  * tf212    : hot leg 2 temperature
[k]
*369  tempf     856010000  * tf233    : cold leg 2 temperature
[k]  * R+
*370  tempf     902020000  * tf312    : hot leg 3 temperature
[k]   * R+
*371  tempf     956010000  * tf333    : cold leg 3 temperature
[k]  * R+
*372  tempf     309050000  * tf454c   : bottom of sg1 downcomer
temperature [k]
*373  tempf     409050000  * tf554c   : bottom of sg2 downcomer
temperature [k]
*374  tempf     509050000  * tf654c   : bottom of sg3 downcomer
temperature [k]
**
*375  httemp    131090701  * ts02091 :
*376  httemp    131000801  * ts02151 :
*377  httemp    131000901  * ts02191 : rod temperature from
middle to
*378  httemp    131001001  * ts02201 : top core elevation [k]
*379  httemp    131001101  * ts02241 : *++ ts = ? (le omemba v
tab.1 str.28/87)
*380  httemp    131001201  * ts02281 :
*381  cntrlvar  146        * tmax     : max. clad temperature
[k]
**
*382  cntrlvar  286        * vp1      : pump 1 rotation speed
[rpm]
*383  cntrlvar  287        * vp2      : pump 2 rotation speed
[rpm]
*384  cntrlvar  288        * vp3      : pump 3 rotation speed
[rpm]
**
*385  cntrlvar  289        * w+02     : core (electrical) power
[kw]
*386  cntrlvar  290        * w+trac   : trace heating [kw]
**
*387  cntrlvar  110        * zt0200   : core level [m]
*388  cntrlvar  291        * zscore   : swollen level [m]
*++
*
*389  dt         0          * dtcalc   : time step along
transient [s]
*390  emass      0          * mer      : mass error [kg]
**
**
```

```
*****************************************************************
*********
*
* comparison report variables request
*
301  cntrlvar  280        * p+p      : PRESSURIZER TOP PRESSURE
[mpA]
302  cntrlvar  278        * p+57     : sg2 STEAM DOME PRESSURE
[mpA]
303  cntrlvar  163        * zt0200   : CORE COLLAPSED LIQUID
LEVEL [M]
* 304  tempg     131120000  * tf03046 : CORE OUTLET STEAM
TEMPERATURE [k]
304  tempg     141010000  * tf03046 : CORE OUTLET STEAM
TEMPERATURE [k]
305  cntrlvar  146        * tmax     : MAX. CLAD WALL!
TEMPERATURE [k]
* 306  voidg     656010000  * albf1    : cl1 SPOOL PIECE VOID
FRACTION [ ]
306  voidg     656070000  * albf1    : cl1 SPOOL PIECE VOID
FRACTION [ ] R+
307  mflowj    180000000  * qmb      : BREAK MASS FLOW RATE
[KG/S]
308  cntrlvar  405        * mgv2     : sg2 SECONDARY SIDE MASS
INVET. [KG]
309  cntrlvar  170        * mcp      : PRIMARY MASS INVENTORY
[KG]
*
310  cntrlvar  271        * intqmb   : BREAK DISCHARGED MASS
[KG]
*
313  cntrlvar  110        * zt0200   : SIMPL. CORE COLLAPSED
LIQUID LEVEL [M]
*
*********.*****************************************************
*********
*
* expanded minor edit requests
*
20800001  sathf  182010000  * liquid spec. enthalpy at sat.
cond. [j/kg]
20800002  sathg  182010000  * vapor spec. enthalpy at sat.
cond. [j/kg]
*
20800003  httemp 131000105  * cladding temperatures [k] (m.p.
5!)
20800004  httemp 131000205  *
20800005  httemp 131000305  *
20800006  httemp 131000405  *
20800007  httemp 131000505  *
20800008  httemp 131000605  *
20800009  httemp 131000705  *
20800010  httemp 131000805  *
20800011  httemp 131000905  *
20800013  httemp 131001005  *
20800014  httemp 131001105  *
20800015  httemp 131001205  *
*
20800016  dt     0           * the current time step [s]
*
*
*****************************************************************
*********
* ccvv       control variables for requested minor edit
*
*****************************************************************
*********
*
* dp = p(low pressure tap) - p (high pressure tap)
*
* cv 240: dp0200: core heat. length diff. press. [kpa]
20524000  dp0200  sum  1.0e-03  0.0  1
20524001  0.0  1.0 p 123010000  -1.0 p 141010000  2.531 rho
131070000
* korekcija: 0.258*9.81=2.531
*
* cv 241: dpupl : upper plenum diff. press. [kpa]
20524100  dpupl  sum  1.0e-03  0.0  1
20524101  0.0  1.0 p 141010000  -1.0 p 147010000  13.400 rho
143010000
* korekcija: 1.366*9.81=13.400
*
* cv 242:dp034 : guide tube dif. press. [kpa] *++ ni opisa v
bazi
20524200  dpupl  sum  1.0e-03  0.0  1
20524201  0.0  1.0 p 141010000  -1.0 p 153010000
*
* cv 243: dpuhead : upper head diff. press. [kpa]
20524300  dpupl  sum  1.0e-03  0.0  1
20524301  0.0  1.0 p 151010000  -1.0 p 153010000  5.582 rho
151010000
* korekcija: 0.569*9.81=5.582
*
* cv 244: dp050: downcommer to upp. head dif. press. [kpa]
20524400  dp050  sum  1.0e-03  0.0  1
20524401  0.0  1.0 p 111010000  -1.0 p 151010000  -3.267 rho
111010000
* korekcija: -0.333*9.81=-3.267
*
* cv 245: dp0r1: pressure vessel dif. press. [kpa]
20524500  dp0r1  sum  1.0e-03  0.0  1
20524501  0.0  1.0 p 123010000  -1.0 p 153010000  5.150 rho
131070000
* korekcija: 0.525*9.81=5.150
*
*
* cv 246: dp1:  cl1 to hl1 diff. press. [kpa]
20524600  dp1  sum  1.0e-03  0.0  1
20524601  0.0  1.0 p 656090000  -1.0 p 603010000  * R+
*
* cv 247: dp12pg: pump 1 diff. press. [kpa]
20524700  dp12pg  sum  1.0e-03  0.0  1
20524701  0.0  1.0 cntrlvar 624  -1.0 p 655010000
*
* cv 248: dp12vg: loop seal 1 downflow side diff. press. [kpa]
20524800  dp12vg  sum  1.0e-03  0.0  1
20524801  0.0  1.0 cntrlvar 623  -1.0 cntrlvar 622
*
* cv 249: dp12vp: loop seal 1 upflowf side diff. press. [kpa]
20524900  dp12vp  sum  1.0e-03  0.0  1
20524901  0.0  1.0 cntrlvar 623  -1.0 cntrlvar 624
*
*
* cv 250: dp2:  cl2 to hl2 diff. press. [kpa]
20525000  dp2  sum  1.0e-03  0.0  1
20525001  0.0  1.0 p 856050000  -1.0 p 803010000  * R+
*
* cv 251: dp22pg: pump 2 diff. press. [kpa]
20525100  dp22pg  sum  1.0e-03  0.0  1
20525101  0.0  1.0 cntrlvar 824  -1.0 p 855010000
*
* cv 252: dp22vg: loop seal 2 downflow side diff. press. [kpa]
20525200  dp22vg  sum  1.0e-03  0.0  1
20525201  0.0  1.0 cntrlvar 823  -1.0 cntrlvar 822
*
* cv 253: dp22vp: loop seal 2 upflowf side diff. press. [kpa]
20525300  dp22vp  sum  1.0e-03  0.0  1
20525301  0.0  1.0 cntrlvar 823  -1.0 cntrlvar 824
*
*
* cv 254: dp3:  cl3 to hl3 diff. press. [kpa]
20525400  dp3  sum  1.0e-03  0.0  1
20525401  0.0  1.0 p 956050000  -1.0 p 903010000  * R+
*
* cv 255: dp32pg: pump 3 diff. press. [kpa]
20525500  dp32pg  sum  1.0e-03  0.0  1
20525501  0.0  1.0 cntrlvar 924  -1.0 p 955010000
*
* cv 256: dp32vg: loop seal 3 downflow side diff. press. [kpa]
20525600  dp32vg  sum  1.0e-03  0.0  1
20525601  0.0  1.0 cntrlvar 923  -1.0 cntrlvar 922
*
* cv 257: dp32vp: loop seal 3 upflowf side diff. press. [kpa]
20525700  dp32vp  sum  1.0e-03  0.0  1
20525701  0.0  1.0 cntrlvar 923  -1.0 cntrlvar 924
*
*
* cv 258: dp4: sg1 u-tube in. to outlet diff. press. [kpa]
20525800  dp4  sum  1.0e-03  0.0  1
20525801  0.0  -1.0 p 301010000  1.0 p 313010000  * R+
*
* cv 259: dp41: sg1 inlet plenum diff. press. [kpa]
20525900  dp41  sum  1.0e-03  0.0  1
20525901  0.0  1.0 cntrlvar 620  -1.0 p 301010000
*
* cv 260: dp426: sg1 u-tube upflow side diff. p. [kpa]
20526000  dp426  sum  1.0e-03  0.0  1
20526001  0.0  1.0 p 301010000  -1.0 cntrlvar 621
*
* cv 261: dp4r2: sg1 boiler section diff. press. [kpa]
20526100  dp4r2  sum  1.0e-03  0.0  1
20526101  0.0  1.0 p 308010000  -1.0 p 310020000
*
*
* cv 262: dp5: sg2 u-tube in. to outlet diff. press. [kpa]
20526200  dp5  sum  1.0e-03  0.0  1
20526201  0.0  -1.0 p 401010000  1.0 p 413010000  * R+
*
* cv 263: dp51: sg2 inlet plenum diff. press. [kpa]
20526300  dp51  sum  1.0e-03  0.0  1
20526301  0.0  1.0 cntrlvar 820  -1.0 p 401010000
*
* cv 264: dp526: sg2 u-tube upflow side diff. p. [kpa]
20526400  dp526  sum  1.0e-03  0.0  1
20526401  0.0  1.0 p 401010000  -1.0 cntrlvar 821
*
* cv 265: dp5r2: sg2 boiler section diff. press. [kpa]
20526500  dp5r2  sum  1.0e-03  0.0  1
20526501  0.0  1.0 p 408i0000  -1.0 p 410020000
*
*
* cv 266: dp6: sg1 u-tube in. to outlet diff. press. [kpa]
20526600  dp6  sum  1.0e-03  0.0  1
20526601  0.0  -1.0 p 501010000  1.0 p 513010000  * R+
*
* cv 267: dp61: sg1 inlet plenum diff. press. [kpa]
20526700  dp61  sum  1.0e-03  0.0  1
```

```
20526701  0.0  1.0 cntrlvar 9[illegible]  -1.0 p 501010000
*
* cv 268: dp626: sg3 u-tube upflow side diff. p. [kpa]
20526800  dp626  sum  1.0e-03  0.0  1
20526801  0.0  1.0 p 501010000  -1.0 cntr[illegible]r 921
*
* cv 269: dp6r2: sg3 boiler section diff. press. [kpa]
20526900  dp6r2  sum  1.0e-03  0.0  1
20526901  0.0  1.0 p 508010000  -1.0 p 510020000
*
*
* cv 270: dpp1: pressurizer diff. press. [kpa]
20527000  dpp1  sum  1.0e-03  0.0  1
20527001  0.0  1.0 p 203010000  -1.0 p 203100000
*
*
* cv 271: intqmb: time integrated break mass flow [kg]
20527100  intqmb  integral  1.0  0.0  0  1  0.0
20527101  mflowj  180000000
*
* cv 272: intsi2: time integrated lpsi 2 mass flow [kg]
20527200  intsi2  integral  1.0  0.0  0  1  0.0
20527201  mflowj  807000000
*
* cv 273: intsi3: time integrated lpsi 2 mass flow [kg]
20527300  intsi3  integral  1.0  0.0  0  1  0.0
20527301  mflowj  907000000
*
* cv 274: intsi23: time integrated lpsi 2+3 mass flow [kg]
20527400  intsi23  sum  1.0  0.0  0  1  0.0
20527401  0.0  1.0 cntrlvar 272  1.0 cntrlvar 273
*
* cv 275: msm2: accumulator 2 mass invetory [kg]
20527500  msm2  mult  1.0  0.0  1
20527501  acvliq 83[illegible]  rhof 833010000
*
* cv 276: msm3: accumulator 3 mass invetory [kg]
20527600  msm3  mult  1.0  0.0  1
20527601  acvliq 933  rhof 933010000
*
*
* cv 277: p+47: sg1 steam dome pressure [mpa]
20527700  p+47  sum  1.0e-06  0.0  1
20527701  0.0  1.0 p 310020000
*
* cv 278: p+57: sg2 steam dome pressure [mpa]
20527800  p+57  sum  1.0e-06  0.0  1
20527801  0.0  1.0 p 410020000
*
* cv 279: p+67: sg3 steam dome pressure [mpa]
20527900  p+67  sum  1.0e-06  0.0  1
20527901  0.0  1.0 p 510020000
*
* cv 280: p+p: pressurizer top pressure [mpa]
20528000  p+p  sum  1.0e-06  0.0  1
20528001  0.0  1.0 p 203100000
*
* cv 281: p+sm2: accumulator 2 gas phase pressure [mpa]
20528100  p+sm2  sum  1.0e-06  0.0  1
20528101  0.0  1.0 p 833010000
*
* cv 282: p+sm3: accumulator 3 gas phase pressure [mpa]
20528200  p+sm3  sum  1.0e-06  0.0  1
20528201  0.0  1.0 p 933010000
*
*
```

```
* cv 283: sebreak: break specific enthalpy [kj/kg]  *++
*         h = x*sathg + (1-x)*sathf
20528300  sebreak  sum  1.0e-03  0.0  1
20528301  0.0  1.0 cntrlvar 284  1.0 sathf 182010000  -1.0
cntrlvar 285
*
* cv 284:  x*sathg [j/kg]
20528400  bvaph  mult  1.0  0.0  1
20528401  quals 182010000  sathg 182010000
*
* cv 285: x*sathf  [j/kg]
20528500  bliqh  mult  1.0  0.0  1
20528501  quals 182010000  sathf 182010000
*
*
* cv 295: sebreak: break specific enthalpy [kj/kg]  *++
*         u = x*ug + (1-x)*ul
*         h = u + p/rho
20529500  sebreak  sum  1.0e-03  0.0  1
20529501  0.0  1.0 cntrlvar 298  1.0 cntrlvar 299
*
* cv 296: x*ug [j/kg]
20529600  bvapu  mult  1.0  0.0  1
20529601  quals 182010000  ug 182010000
*
* cv 297: x*ul [j/kg]
20529700  bliqu  mult  1.0  0.0  1
20529701  quals 182010000  uf 182010000
*
* cv 298: u = x*ug + (1-x)ul [j/kg]
20529800  [illegible]  sum  1.0  0.0  1
20529801  0.0  1.0 cntrlvar 296  1.0 uf 182010000  -1.0
cntrlvar 297
*
* cv 299: p/rho [j/kg]
20529900  bliqu  div  1.0  0.0  1
20529901  rho 182010000  p 182010000
*
*
* cv 286: vp1 pump 1 rotation speed [rpm]
20528600  vp1  mult  9.5493  0.0  1
20528601  pmpvel 701
*
* cv 287: vp2 pump 2 rotation speed [rpm]
20528700  vp2  mult  9.5493  0.0  1
20528701  pmpvel 702
*
* cv 288: vp3 pump 3 rotation speed [rpm]
20528800  vp3  mult  9.5493  0.0  1
20528801  pmpvel 703
*
*
* cv 289: w+02: core power [kw]
20528900  w+02  function  1.0e-03  0.0  1
20528901  time 0  100
*
* cv 290: w+trac: trace heating [kw]
20529000  w+trac  function  1.0e-03  0.0  1
20529001  time 0  102
*
20210200  power  670  * accum. injection
20210201  -1.0  107.5e+03
20210202   0.0  107.5e+03
20210203   1.0    0.0e+03
*
* cv 291: zscore: swollen level [m]  *++
```

```
20529100  zscore  constant  0.0
*
*
*****************************************************************
*********
* ttrr                          tripi
*
*****************************************************************
*********
*
*
501  time          0  gt  null      0  1000.0      n   * break
603  -501   or  -501                                n   * no
break
*
*
503  p     203090000  lt  null      0  131.0e+05  n   * scram
signal
505  p     203090000  lt  null      0  119.0e+05  n   * si
signal
*
515  time          0  gt  timeof  505   30.0      n   * aux.
feed on
*
520  p     203090000  lt  null      0   41.6e+05  n   * accum.
injection                                              intact
*
loops only 2,3
521  p     203090000  lt  null      0   14.6e+05  n   *
accum.isolation
*
*
526  cntrlvar    146  gt  null      0  723.0      1   *
ultimate procedure
527  time          0  gt  timeof  505   30.0      n   * afw
actuation on si
*
*
626   527  and  -526   n   * afw:  on si and before ultimate
procedure
657  -521   or  -521   n   * prz pressure gt 14.6 bar
659   526  and   657   n   * accumulator open trip
*
670   659   or   659   1   * trace heating off --> heat losses
*
*
*****************************************************************
*********
* rrxxccvv      r x   c o n t r o l   v a r i a b l e s
*
*****************************************************************
*********
*
* ctv 100: core bypass inventory mass (kg) bbb
20510000 coremass sum    1.0-3  0.       1
20510001 0.0     7.5047 rho 133010000     3.6955 rho 133020000 *
c.bypass
20510002         3.6955 rho 133030000     3.6955 rho 133040000
20510003         3.6955 rho 133050000     3.6955 rho 133060000
20510004         3.6955 rho 133070000     3.6955 rho 133080000
20510005         3.6955 rho 133090000     3.6955 rho 133100000
20510006         3.6955 rho 133110000     7.5047 rho 133120000
*
* ctv 101: core inventory mass (kg)
20510100 coremass sum    1.0-3  0.       1
```

```
20510101 0.0   22.5984 rho 131010000   11.1280 rho 131020000 *
core
20510102       11.1280 rho 131030000   11.1280 rho 131040000
20510103       11.1280 rho 131050000   11.1280 rho 131060000
20510104       11.1280 rho 131070000   11.1280 rho 131080000
20510105       11.1280 rho 131090000   11.1280 rho 131100000
20510106       11.1280 rho 131110000   22.598. rho 131120000
*
* ctv 102: reactor vessel inventory mass (kg)
20510200 vessmass sum    1.0-3  0.       1
20510201 0.0   20.2492 rho 111010000                          *
upp.downc.
20510202       14.4648 rho 113010000   14.4648 rho 115010000 *
core inlet
20510203       14.4648 rho 117010000                          *
core inlet
* ddd ++ art.
20510204       31.9369 rho 119010000   31.9369 rho 119050000 *
downcommer
20510205       31.9369 rho 119070000                          *
downcommer
20510206       18.3410 rho 119100000   27.9758 rho 119140000 *
downcommer
2
20510207       65.9122 rho 121010000   87.3224 rho 123010000 *
low.head+plen.
20510208       68.3618 rho 125010000                          *
core inlet
20510209     1000.0000 cntrlvar  101                          *
core
20510210     1000.0000 cntrlvar  100                          *
c.bypass bbb
20510211       69.9396 rho 141010000   98.7564 rho 143010000 *
upp.plen.
20510212        9.2200 rho 145010000                          *
guide tube
20510213      110.1513 rho 147010000                          *
upp.plen.
20510214       75.1800 rho 151010000   49.9430 rho 153010000 *
upp.head
*
* ctv 110: core level (m)
20511000 corelevl sum    1.0     0.       1
20511001 0.0    .528 voidf 131010000  0.26 voidf 131020000  0.26
voidf 131030000
20511002       0.26 voidf 131040000  0.26 voidf 131050000  0.26
voidf 131060000
20511003       0.26 voidf 131070000  0.26 voidf 131080000  0.26
voidf 131090000
20511004       0.26 voidf 131100000  0.26 voidf 131110000   .528
voidf 131120000
*
* ctv 111: reactor vessel level (m)
20511100 vesslevl sum    1.0     0.       1
20511101 0.0 0.4   voidf 121010000 0.6   voidf 123010000 1.164
voidf 125010000
20511102     1.0   cntrlvar    110
20511103     .8645 voidf 141010000 1.127 voidf 143010000 2.155
voidf 147010000
20511104     .4545 voidf 153010000
*
* ctv 120: reactor power (kw)
20512000 rktpower sum   1.0-3  2864.     1
20512001 0.0  1.0 q 131010000  1.0 q 131020000  1.0 q 131030000
20512002      1.0 q 131040000  1.0 q 131050000  1.0 q 131060000
20512003      1.0 q 131070000  1.0 q 131080000  1.0 q 131090000
20512004      1.0 q 131100000  1.0 q 131110000  1.0 q 131120000
20512005      1.0 q 133010000
*
* ctv 146: maximum httemp rx core, left surface
20514600  maxrxt   stdfnctn  1.0  600.  1
20514601  max  httemp  131000105  httemp 131000205
20514602       httemp  131000305  httemp 131000405
20514603       httemp  131000505  httemp 131000605
20514604       httemp  131000705  httemp 131000805
20514605       httemp  131000805  httemp 131001005
20514606       httemp  131000905  httemp 131001205
*
*
*****************************************************************
*********
*
*
* rrxx            r e a c t o r   v e s s e l
*
*
*
*****************************************************************
*********
*
*****************************************************************
*********
*  region 110: vessel inlet part + downcommer (upper + lower)
*
*****************************************************************
*********
*
* * component 111: upper downcommer - upper head connection
* 1110000 dc-uphea branch
* 1110001 0
* 1110101 0.  4.09485 41.9464-3 0.  90.  2.1049 5.-5 5.693-2 00
* * geom v25-33+(v34+v35+v36del)/2
*
*****************************************************************
*********
*
* ++++ nov model bypassa v glavo
* v34:
1100000   v34 branch
1100001   1  1
1100101   0.0  0.4635  21.7085e-03  0.0  90.0  0.4635  5.-5
0.250  00
1100200 100  1.58649e+07  1.24844e+06  2.43927e+06  0.00000e+00
* 1101101   110010000  111000000  1.901e-03  0.1  1.0  130000
* ++ ENTR MODEL
1101101   110010000  111000000  1.901e-03  0.1  1.0  110000   *
fff
1101201  2.13960e+00  2.13960e+00  0.00000e+00
*
* v33-v26 upper downcommer - upper head connection
1110000 dc-uphea branch
1110001 0
1110101 1.901e-03  3.1314  0.0  0.0  18.  1.1414  5.-5  0.0492
00
1110200 100  1.58559e+07  1.24844e+06  2.43948e+06  0.00000e+00
*
* v25:
1120000   v25 branch
1120001   1  1
1120101   0.0  0.5  13.055e-03  0.0  90.0  0.5  5.-5  0.170  00
1120200 100  1.58487e+07  1.24844e+06  2.43965e+06  0.00000e+00
1121101   111010000  112000000  1.901e-03  1.0  0.1  130000  *
++ ENTR MODEL
1121201  2.13960e+00  2.13960e+00  0.00000e+00
*
* component 152: bypass into vessel head
1510000 headbyps valve * sngljun
* 1520101 112010000 151000000 2.454-4 0. 0. 100000 * geom j25
1520101 112010000 151000000 2.454-4 0. 0. 100000 * geom j25   *
fff
1520110 0.017  0.0  1.0  1.0
1520300 srvvlv
1520301 152
1520401 0.01  0.1   0.1
1520402 1.0   33.0   33.0
*
* cccl : ctv 152: flow regulation into vessel head
20515200 valve152 sum 1. 0.2956 0 3 0.01  1.
20515201 0.0306 -0.01 mflowj 152000000  1.0 cntrlvar 152
*
*****************************************************************
*********
*
* component 113: vessel inlet (1 of 3)
1130000 vess-in1 branch
1130001 3
*                                                          geom
(v34+v35+v36del)/6
1130101 0.  0.4635 7.2324-3 0.  -90.  -0.4635 5.-5 123.47-3 00
* 1131101 113000000  111000000 1.5612-2  2.1 2.1 130000 * geom
j35/3
1131101 113000000  110000000 1.5612-2  2.1 2.1 110000 * geom
j35/3 * ++++ fff
1132101 113010000  119000000 1.5612-2  0.3 0.3 130000 * geom
j35/3
1133101 656010000  113000000 1.09358-2 1.  1.  130000 * geom
j340
*
* component 115: vessel inlet (2 of 3)
1150000 vess-in2 branch
1150001 3
*                                                          geom
(v34+v35+v36del)/6
1150101 0.  0.4635 7.2324-3 0.  -90.  -0.4635 5.-5 123.47-3 00
* 1151101 115000000  111000000 1.5612-2  2.1 2.1 130000 * geom
j35/3
1151101 115000000  110000000 1.5612-2  2.1 2.1 110000 * geom
j35/3 * ++++ fff
1152101 115010000  119000000 1.5612-2  0.3 0.3 130000 * geom
j35/3
1153101 856010000  115000000 1.09358-2 1.  1.  130000 * geom
j340
*
* component 117: vessel inlet (3 of 3)
1170000 vess-in3 branch
1170001 3
*                                                          geom
(v34+v35+v36del)/6
1170101 0.  0.4635 7.2324-3 0.  -90.  -0.4635 5.-5 123.47-3 00
* 1171101 117000000  111000000 1.5612-2  2.1 2.1 130000 * geom
j35/3
1171101 117000000  110000000 1.5612-2  2.1 2.1 110000 * geom
j35/3 * ++++ fff
1172101 117010000  119000000 1.5612-2  0.3 0.3 130000 * geom
j35/3
1173101 956010000  117000000 1.09358-2 1.  1.  130000 * geom
j340
```

```
*
* * component 119: downcommer
* 1190000 downcomm pipe
* 1190001 5
* 1190101 0. 5
* 1190301  1.348833  3   0.779367 4   1.054    5 * geom
v36del+v37+v38-39+v40
* 1190401 31.9457-3 3  18.341-3  4  27.9758-3 5 * geom
v36del+v37+v38-39+v40
* 1190601 -90. 3  -39.3 4  -90. 5
* 1190701 -1.348833 3  -0.49405 4  -0.95406 5
* 1190801 5.-5 0.18 1  5.-5 0.1731 4  5.-5 0.045 5 * geom j37-
j40+j41
* 1190901 0. 0. 2  0.83 0.83 4
* 1191001 0 5
* 1191101 100000 4
*
* component 119: downcommer ddd
1190000 downcomm pipe
1190001 14
1190101 2.36-2 13  2.65-2 14
1190301 0.6746 1  0.528 2  0.26 12  0.528 13  1.1640 14
1190601 -90. 14   * ++ appr.
1190801 5.-5 0.18 1  5.-5 0.1731 13  5.-5 0.045 14
1190901 0. 0. 12  0.83 0.83 13
1191001 0 14
1191101 100000 13
*
*****************************************************************
*********
*  region 120: vessel bottom + lower plenum + core inlet
*
*****************************************************************
*********
*
* component 121: bottom of reactor
1210000 botmhead snglvol
1210101 0. 0.4 65.9122-3 0. 90.0 0.4 5.-5 44.8493-3 00 * geom -
v1
*
* component 123: lower plenum
1230000 lower-pl branch
1230001 3
1230101 0. 0.6 87.3224-3 0. 90.0 0.6 5.-5 36.44-3 00 * geom
v2+v3+v4
*1231101 119010000 123010000  2.6543-2  0.  0.  00000 * geom
j41
1231101 119010000 123010000  2.6543-2  2.8 2.8 130000 * geom
j41 * dodaten k
1232101 123010000 125000000  5.8910-2  1.8 1.8 130000 * geom j5
1233101 121010000 123000000 16.2858-2  0.  0.  130000 * geom j2
1231110 0.045  0.0  1.0  1.0
*
* component 125: core inlet
1250000 coreinlt branch
1250001 1
1250101 0. 1.164 68.3618-3 0. 90. 1.164 5.-5 15.8743-3 00 *
geom v5+v6+v50(del)
1251101 125010000 131000000 4.28-2 0. 0. 130000 * geom j6
*
* component 126: core bypass inlet junction
1260000 intobyps  valve * sngljun
1260101 125010000 133000000 0.2143-2  0. 0.  100000 * geom j50
1260110 0.0147  0.0 1.0  1.0
1260300 srvvlv
1260301 126
1260401 0.01  0.1   0.1
1260402 1.0   33.0   33.0
*
* ccci : ctv 126: flow regulation into core bypass
20512600 valve126 sum 1. 0.6481 0 3 0. 1.
20512601 0.045  -0.01 mflowj 126000000  1.0 cntrlvar 126
*
*****************************************************************
*********
*  region 130: core + core bypass
*
*****************************************************************
*********
*
* component 131: core
1310000 core pipe
1310001 12
1310101 4.28-2 12 * geom j6+j7+j8
1310301 0.528 1  0.26 11  0.528 12 * geom v7
1310601 90. 12
1310801 5.-5  11.3-3  12 * geom j6+j7+j8
1310901 0.1 0.1 11
1311001 00100 12
1311101 100000 11
1311401 0.0113  0.0  1.0  1.0  11
*
* * component 133: core bypass  * bbb
* 1330000 corebyps snglvol
* 1330101 0. 3.656 51.9532-3 0. 90. 3.656 5.-5 24.7-3 00 * geom
v50(del)
*
1330000 corebyps pipe  * bbb
1330001 12
1330101 0.01421  12
1330301 0.528 1  0.26 11  0.528 12
1330601 90. 12
1330801 5.-5  24.7-3  12
1330901 0.0 0.0 11
1331001 00000 12
1331101 100000 11
1331401 24.7-3  0.0  1.0  1.0  11
*
*****************************************************************
*********
*  region 140: core outlet + upper plenum
*
*****************************************************************
*********
*
* component 141: region above the core
1410000 abovcore branch
1410001 3
1410101 0. 0.8645 69.9396-3 0. 90. 0.8645 5.-5 0.156 00 * geom
v8-v11+v50(del)
1411101 131010000 141000000 0.        2.1 2.1 130000 *(geom j8)
1412101 133010000 141000000 0.2143-2 0.  0.  130000 * geom j50
1413101 141010000 143000000 8.799-2  1.8 1.8 130000 * geom j12
1412110 0.0147  0.0 1.0  1.0
*
* component 143: upper plenum
1430000 vesslout branch
1430001 3
1430101 0. 0.5635 49.5814-3 0. 90. 0.5635 5.-5 0.2081 00 * geom
v12(del)
1431101 143010000 603000000 1.09358-2 1.6 1.6 130000 * geom
j140
1432101 143010000 803000000 1.09358-2 1.6 1.6 130000 * geom
j140
1433101 143010000 903000000 1.09358-2 1.6 1.6 130000 * geom
j140
*
* component 145: rcc guide tube
1450000 guid-tub branch
1450001 2
*1450101 0. 3.335 9.22-3 0. 90. 3.335 5.-5 0. 00 * geom v20
1450101 0. 3.335 9.22-3 0. 90. 3.282 5.-5 0. 00 * geom v20 *
zaradi 147010000
* 1451101 141010000 145000000 2.094-2  5.  5. 130000 * geom j20
1451101 141010000 145000000 2.094-2  5.  5. 110000 * geom j20
* fff
* 1452101 145010000 147010000 7.063-4 50. 50. 130000 * geom
j200
* ggg 1452101 145010000 147010000 7.063-4 50. 50. 110000 * geom
j200   * fff
1452101 145010000 153000000 7.063-4 50. 50. 110000 * geom j200
* fff
* ggg * 1453101 145010000 153000000 2.743-3 10. 10. 130000 *
geom j21
* ggg 1453101 145010000 153000000 2.743-3 10. 10. 110000 * geom
j21    * fff
*
* component 147: upper plenum
1470000 upper-pl branch
1470001 1
1470101 0. 2.7185 159.3263-3 0. 90. 2.7185 5.-5 1.-1 00 * geom
v12(del)-v19
* 1471101 143010000 147000000 0. 0. 0. 130000 *(geom j14)
1471101 143010000 147000000 0. 0. 0. 110000 *(geom j14)    *
fff
*
*****************************************************************
*********
*  region 150: vessel upper head
*
*****************************************************************
*********
*
* component 151: upper head (lower part, around upper plenum)
1510000 aro-uppl branch
1510001 1
1510101 0. 0.9035 75.1799-3 0. 90. 0.9035 5.-5 0.17 00 * geom
v23(del)+v24
* 1511101 151010000 153000000 7.878-2 0. 0. 130000 * geom j23
or j24
1511101 151010000 153000000 7.878-2 0. 0. 110000 * geom j23 or
j24 * fff
1511110 0.017  0.0  1.0  1.0
*
* * ++++
* * component 152: bypass into vessel head
* 1520000 headbyps valve * snglju
* 1520101 111010000 151000000 2.454-4 0. 0. 100000 * geom j25
* 1520110 0.017  0.0  1.0  1.0
* 1520300 srvvlv
* 1520301 152
* 1520401 0.01  0.1   0.1
* 1520402 1.0   33.0   33.0
* *
* * ccci : ctv 152: flow regulation into vessel head
* 20515200 valve152 sum 1. 0.2956 0 3 0.01  1.
* 20515201 0.0306 -0.01 mflowj 152000000  1.0 cntrlvar 152
*
```

```
* component 157, upper head (upper part)
1530000 upp-head branch
1530001 1
1530101 0. 0.4545 49.9431-3 0. 90. 0.4545 5.-5 0.38 00 * geom
v21+v22+v23(del)
* 157101 147010000 153000000 7.06858-6 100. 110. 130000 * geom
j190
1531101 147010000 153000000 7.06858-6 100. 110. 110000 * geom
j190 * fff
*
************************************************************
*********
*           reactor vessel initial conditions - volumes
*
************************************************************
*********
*
1110200 100  1.58559e+07  1.24844e+06  2.43948e+06  0.00000e+00
1130200 100  1.58612e+07  1.24844e+06  2.43935e+06  0.00000e+00
1150200 100  1.58612e+07  1.24844e+06  2.43935e+06  0.00000e+00
1170200 100  1.58612e+07  1.24844e+06  2.43935e+06  0.00000e+00
* ddd
1191201 100  1.58421e+07  1.24844e+06  2.43980e+06  0.00000e+00
0.00000e+00   1
1191202 100  1.58451e+07  1.24844e+06  2.43973e+06  0.00000e+00
0.00000e+00   2
1191203 100  1.58471e+07  1.24844e+06  2.43968e+06  0.00000e+00
0.00000e+00   3
1191204 100  1.58484e+07  1.24844e+06  2.43965e+06  0.00000e+00
0.00000e+00   4
1191205 100  1.58497e+07  1.24844e+06  2.43962e+06  0.00000e+00
0.00000e+00   5
1191206 100  1.58510e+07  1.24844e+06  2.43959e+06  0.00000e+00
0.00000e+00   6
1191207 100  1.58523e+07  1.24844e+06  2.43956e+06  0.00000e+00
0.00000e+00   7
1191208 100  1.58536e+07  1.24844e+06  2.43953e+06  0.00000e+00
0.00000e+00   8
1191209 100  1.58549e+07  1.24845e+06  2.43950e+06  0.00000e+00
0.00000e+00   9
1191210 100  1.58562e+07  1.24845e+06  2.43947e+06  0.00000e+00
0.00000e+00  10
1191211 100  1.58575e+07  1.24845e+06  2.43944e+06  0.00000e+00
0.00000e+00  11
1191212 100  1.58588e+07  1.24845e+06  2.43941e+06  0.00000e+00
0.00000e+00  12
1191213 100  1.58607e+07  1.24845e+06  2.43936e+06  0.00000e+00
0.00000e+00  13
1191214 100  1.58432e+07  1.24846e+06  2.43977e+06  0.00000e+00
0.00000e+00  14
1210200 100  1.58080e+07  1.24592e+06  2.44060e+06  0.00000e+00
1230200 100  1.58043e+07  1.24846e+06  2.44068e+06  0.00000e+00
1250200 100  1.57808e+07  1.24847e+06  2.44124e+06  0.00000e+00
1311201 100  1.57614e+07  1.24994e+06  2.44169e+06  0.00000e+00
0.00000e+00   1
1311202 100  1.57495e+07  1.25088e+06  2.44197e+06  0.00000e+00
0.00000e+00   2
1311203 100  1.57414e+07  1.25218e+06  2.44216e+06  0.00000e+00
0.00000e+00   3
1311204 100  1.57333e+07  1.25385e+06  2.44235e+06  0.00000e+00
0.00000e+00   4
1311205 100  1.57252e+07  1.25584e+06  2.44254e+06  0.00000e+00
0.00000e+00   5
1311206 100  1.57171e+07  1.25800e+06  2.44273e+06  0.00000e+00
0.00000e+00   6
1311207 100  1.57090e+07  1.26015e+06  2.44292e+06  0.00000e+00
0.00000e+00   7
1311208 100  1.57009e+07  1.26214e+06  2.44311e+06  0.00000e+00
0.00000e+00   8
1311209 100  1.56928e+07  1.26378e+06  2.44330e+06  0.00000e+00
0.00000e+00   9
1311210 100  1.56847e+07  1.26506e+06  2.44349e+06  0.00000e+00
0.00000e+00  10
1311211 100  1.56765e+07  1.26597e+06  2.44369e+06  0.00000e+00
0.00000e+00  11
1311212 100  1.56646e+07  1.26741e+06  2.44397e+06  0.00000e+00
0.00000e+00  12
* bbb
1331201 100  1.56734e+07  1.24866e+06  2.44376e+06  0.00000e+00
0.00000e+00   1
1331202 100  1.56705e+07  1.24893e+06  2.44383e+06  0.00000e+00
0.00000e+00   2
1331203 100  1.56685e+07  1.24931e+06  2.44387e+06  0.00000e+00
0.00000e+00   3
1331204 100  1.56666e+07  1.24985e+06  2.44392e+06  0.00000e+00
0.00000e+00   4
1331205 100  1.56646e+07  1.25055e+06  2.44397e+06  0.00000e+00
0.00000e+00   5
1331206 100  1.56627e+07  1.25141e+06  2.44401e+06  0.00000e+00
0.00000e+00   6
1331207 100  1.56608e+07  1.25243e+06  2.44406e+06  0.00000e+00
0.00000e+00   7
1331208 100  1.56588e+07  1.25355e+06  2.44410e+06  0.00000e+00
0.00000e+00   8
1331209 100  1.56569e+07  1.25473e+06  2.44415e+06  0.00000e+00
0.00000e+00   9
1331210 100  1.56550e+07  1.25592e+06  2.44419e+06  0.00000e+00
0.00000e+00  10
1331211 100  1.56530e+07  1.25708e+06  2.44424e+06  0.00000e+00
0.00000e+00  11
1331212 100  1.56501e+07  1.25827e+06  2.44431e+06  0.00000e+00
0.00000e+00  12
*
1410200 100  1.56427e+07  1.26681e+06  2.44448e+06  0.00000e+00
1430200 100  1.56338e+07  1.26677e+06  2.44469e+06  0.00000e+00
1450200 100  1.56296e+07  1.24918e+06  2.44479e+06  0.00000e+00
1470200 100  1.56238e+07  1.24870e+06  2.44493e+06  0.00000e+00
1510200 100  1.56303e+07  1.24843e+06  2.44478e+06  0.00000e+00
1530200 100  1.56253e+07  1.24836e+06  2.44490e+06  0.00000e+00
*
************************************************************
*********
*           reactor vessel initial conditions - junctions
*
************************************************************
*********
*
1131201  8.73255e-02  1.03450e-01  0.00000e+00
1132201  4.33350e+00  4.56840e+00  0.00000e+00
1133201  6.31120e+00  6.31120e+00  0.00000e+00
1151201  8.66034e-02  1.02550e-01  0.00000e+00
1152201  4.33340e+00  4.56830e+00  0.00000e+00
1153201  6.31000e+00  6.31000e+00  0.00000e+00
1171201  8.66034e-02  1.02550e-01  0.00000e+00
1172201  4.33340e+00  4.56830e+00  0.00000e+00
1173201  6.31000e+00  6.31000e+00  0.00000e+00
* ddd
1191301  8.60030e+00  8.96080e+00  0.00000e+00   1
1191302  8.60030e+00  8.96070e+00  0.00000e+00   2
1191303  8.60020e+00  8.96070e+00  0.00000e+00   3
1191304  8.60020e+00  8.96060e+00  0.00000e+00   4
1191305  8.60020e+00  8.96060e+00  0.00000e+00   5
1191306  8.60020e+00  8.96060e+00  0.00000e+00   6
1191307  8.60020e+00  8.96060e+00  0.00000e+00   7
1191308  8.60020e+00  8.96050e+00  0.00000e+00   8
1191309  8.60020e+00  8.96050e+00  0.00000e+00   9
1191310  8.52830e+00  8.52830e+00  0.00000e+00  10
1191311  8.60020e+00  8.96050e+00  0.00000e+00  11
1191312  8.60010e+00  8.96040e+00  0.00000e+00  12
1191313  8.60010e+00  8.96040e+00  0.00000e+00  13
*
1231201  7.64680e+00  7.64680e+00  0.00000e+00
1232201  3.44560e+00  3.69440e+00  0.00000e+00
1233201  9.17082e-10  9.17210e-10  0.00000e+00
1251201  4.60290e+00  4.88210e+00  0.00000e+00
1260201   0  2.79150e+00  2.79150e+00  0.00000e+00
1311301  4.60620e+00  4.60620e+00  0.00000e+00   1
1311302  4.60830e+00  4.60830e+00  0.00000e+00   2
1311303  4.61120e+00  4.61120e+00  0.00000e+00   3
1311304  4.61480e+00  4.61480e+00  0.00000e+00   4
1311305  4.61930e+00  4.61930e+00  0.00000e+00   5
1311306  4.62410e+00  4.62410e+00  0.00000e+00   6
1311307  4.62890e+00  4.62890e+00  0.00000e+00   7
1311308  4.63340e+00  4.63340e+00  0.00000e+00   8
1311309  4.63770e+00  4.63710e+00  0.00000e+00   9
1311310  4.55090e+00  4.55090e+00  0.00000e+00  10
1311311  4.64210e+00  4.64210e+00  0.00000e+00  11
* bbb
1331301  4.21080e-01  4.21080e-01  0.00000e+00   1
1331302  4.21130e-01  4.21130e-01  0.00000e+00   2
1331303  4.21210e-01  4.21210e-01  0.00000e+00   3
1331304  4.21320e-01  4.21320e-01  0.00000e+00   4
1331305  4.21460e-01  4.21460e-01  0.00000e+00   5
1331306  4.21630e-01  4.21630e-01  0.00000e+00   6
1331307  4.21830e-01  4.21830e-01  0.00000e+00   7
1331308  4.22060e-01  4.22060e-01  0.00000e+00   8
1331309  4.22300e-01  4.22300e-01  0.00000e+00   9
1331310  2.79150e+00  2.79150e+00  0.00000e+00  10
1331311  4.22770e-01  4.22770e-01  0.00000e+00  11
*
1411201  4.64540e+00  4.64540e+00  0.00000e+00
1412201  2.80500e+00  2.80500e+00  0.00000e+00
1413201  2.37040e+00  2.58520e+00  0.00000e+00
1431201  6.36860e+00  6.64590e+00  0.00000e+00
1432201  6.36740e+00  6.64470e+00  0.00000e+00
1433201  6.36740e+00  6.64470e+00  0.00000e+00
1451201 -1.78130e-01 -2.17150e-01  0.00000e+00
1452201  4.75840e-01  4.75840e-01  0.00000e+00
* 1453201 -1.48180e+00 -1.48180e+00  0.00000e+00  * ggg
1471201 -5.80170e-03 -6.07205e-03  0.00000e+00
1511201  5.16451e-02  5.56476e-02  0.00000e+00
1520201   0  1.65750e+01  1.65750e+01  0.00000e+00
1531201 -5.58540e-01 -5.58550e-01  0.00000e+00
*
*
************************************************************
*********
* hhss          reactor vessel heat structures - active
*
************************************************************
*********
*
* reactor core: 428 heater rods - active part
11310000 12 6 2 1 0.
11310100 0 1
11310101 1 0.575-3  2 3.575-3  1 4.15-3  1 4.75-3
11310201 2 4  1 5
```

```
11310301 0. 1  1. 3  0. 5
11310401 570. 6
11310501 0          0     0 0   0.0   12
11310601 131010000 0     1 1 225.984  1 * =0.528*428
11310602 131020000 10000 1 1 111.28  11 * =0.26 *428
11310603 131120000 0     1 1 225.984 12 * =0.528*428
11310701 100  0.0764824  0  0   1
11310702 100  0.0490314  0  0   2
11310703 100  0.0682176  0  0   3
11310704 100  0.0874038  0  0   4
11310705 100  0.1051688  0  0   5
11310706 100  0.1136960  0  0   6
11310707 100  0.1136960  0  0   7
11310708 100  0.1051688  0  0   8
11310709 100  0.0874038  0  0   9
11310710 100  0.0682176  0  0  10
11310711 100  0.0490314  0  0  11
11310712 100  0.0764824  0  0  12
11310801 0.011875 10. 10. 0. 0. 0. 0. 1. 12
*
* tab 100: scram table
20210000 power    503      *  power versus time
20210001      -1.0  2864.0+3       0.0  2864.0+3      17.0
2864.0+3
20210002      17.6  2720.0+3      19.0  2578.0+3      21.5
2434.0+3
20210003      24.0  2290.0+3      26.8  2148.0+3      29.7
2005.0+3
20210004      32.6  1862.0+3      36.0  1750.0+3      44.0
1550.0+3
20210005      52.0  1385.0+3      63.0  1265.0+3      74.0
1170.0+3
20210006      84.0  1110.0+3      94.0  1050.0+3     104.0
990.0+3
20210007     123.0   964.0+3     153.0   906.0+3     198.0
854.0+3
20210008     273.0   812.0+3     373.0   750.0+3     423.0
726.0+3
20210009     523.0   706.0+3     623.0   680.0+3     723.0
662.0+3
20210010     823.0   647.0+3     923.0   629.0+3    1923.0
510.0+3
20210011    3123.0   439.0+3    5123.0   380.0+3    7123.0
340.0+3
20210012    9123.0   324.0+3   18123.0   271.0+3
*
*
*******************************************************************
*********
* hhss        reactor vessel heat structures - passive
*
*******************************************************************
*********
*
* upper downcomner
11110000 1 3 2 1 0.022659
11110100 0 1
11110101 2 0.0434
11110201 1 2
11110301 0 2
11110401 560. 3
11110501 111010000 0 1 1 3.63135 1
11110601 0          0 0 1 3.63135 1
11110701 0 0. 0. 0. 1
11110801 0  10. 10. 0. 0. 0. 0. 1. 1
*
* vessel inlet (cold leg connection)
11130000 3 3 2 1 0.123786
11130100 0 1
11130101 2 0.163047
11130201 1 2
11130301 0 2
11130401 560. 3
11130501 113010000 2000000 1 1 0.309 3 * 0.927/3=0.309
11130601 0                0 0 1 0.309 3
11130701 0 0. 0. 0. 3
11130801 0. 10. 10. 0. 0. 0. 0. 1. 3
*
* trefoil shaped piece
11131000 3 3 1 1 0.
11131100 0 1
11131101 2 6.-3
11131201 1 2
11131301 0 2
11131401 560. 3
11131501 113010000 2000000 1 1 0.11 3
11131601 115010000 2000000 1 1 0.11 2
11131602 113010000       0 1 1 0.11 3
11131701 0 0. 0. 0. 3
11131801 0 10. 10. 0. 0.  0. 0.  1. 3
11131901 0 10. 10. 0. 0.  0. 0.  1. 3
*
* downcomner (upper part): hh11  * ddd
11190000 13 3 2 1 86.1805-3
11190100 0 1
11190101 2 110.8786-3
11190201 1 2
11190301 1.0 2
11190401 560. 3
11190501 119010000       0 1 1 0.6746  1
11190502 119020000       0 1 1 0.5280  2
11190503 119030000   10000 1 1 0.2600 12
11190504 119130000       0 1 1 0.5280 13
11190601         0       0 0 1 0.6746  1
11190602         0       0 0 1 0.5280  2
11190603         0       0 0 1 0.2600 12
11190604         0       0 0 1 0.5280 13
11190701 10223 0.0714 0. 0. 13
11190801 0. 10. 10. 0. 0. 0. 0. 1. 13
*
* downcomner (lower part): hh11  * ddd
11191000 1 3 2 1 0.198778
11191100 0 1
11191101 2 0.236226
11191201 1 2
11191301 1.0 2
11191401 563. 3
11191501 119140000 0 1 1 1.164 1
11191601 0         0 0 1 1.164 1
11191701 10223 0.0714 0. 0. 1
11191801 0 10. 10. 0. 0.  0. 0.  1. 1
*
* bottom head
11210000 1 3 2 1 0.249359
11210100 0 1
11210101 2 0.322124
11210201 1 2
11210301 0 2
11210401 560. 3
11210501 121010000 0 1 1 0.4 1
11210601 0         0 0 1 0.4 1
11210701 0 0. 0. 0. 1
11210801 0. 10. 10. 0. 0. 0. 0. 1. 1
*
* reactor core: 428 heater rods - inactive part
*11211000 4 3 2 1 0.
11211000 2 3 2 1 0.
11211100 0 1
11211101 2 4.75-3
11211201 1 2
11211301 0 2
11211401 560. 3
*11211501 0          0 0 0   0.0   4
11211501 0          0 0 0   0.0   2
*11211601 121010000 0 1 1 171.200 1 * =0.400*428
*11211602 123010000 0 1 1 256.800 2 * =0 400*428
*11211603 125010000 0 1 1 498.192 3 * =1.164*428
*11211604 141010000 0 1 1  75.756 4 * =0.177*428
* coupled
11211601 123010000 0 1 1 926.192 1 * =(0.4+0.6+1.164)*428
11211602 141010000 0 1 1  75.756 2 * =0.177*428
*
*11211701 0 0. 0. 0. 4
*11211901 0 0. 0. 0. 4
11211701 0 0. 0. 0. 2
11211901 0 10. 10. 0. 0.  0. 0.  1. 2
*
* tie rods (8 rods)
*11212000 3 3 2 1 0.
11212000 1 3 2 1 0.
11212100 0 1
11212101 2 7.-3
11212201 1 2
11212301 0 2
11212401 560. 3
*11212501 0          0 0 1 0.0   3
1.212501 0          0 0 1 0.0   1
*11212601 121010000 0 1 1 3.2   1 * 8*0.4
*11212602 123010000 0 1 1 4.8   2 * 8*0.6
*11212603 125010000 0 1 1 8.432 3 * 8*1.054
* coupled
11212601 123010000 0 1 1 16.432 1 * 8*(0.4+0.6+1.054)
*
*11212701 0 0. 0. 0. 3
*11212901 0 0. 0. 0. 3
11212701 0 0. 0. 0. 1
11212901 0 10. 10. 0. 0.  0. 0.  1. 1
*
* water chamber
11213000 1 3 1 1 0.
11213100 0 1
11213101 2 0.976426 * 0.162 m3 = 0.1323m3 + 4/3*0.02234 m3 (for
water)
11213201 1 2
11213301 0 2
11213401 560. 3
11213501 121010000 0 1 1 0.166 1
11213601 0          0 0 1 0.166 1 * this end has 155 c (cooling)
- ignored !!!
11213701 0 0. 0. 0. 1
11213801 0 10. 10. 0. 0.  0. 0.  1. 1
*
* lower plenum: hh11
11230000 1 3 2 1 0.242895
11230100 0 1
11230101 2 0.274279
11230201 1 2
11230301 1.0 2
```

```
11230401 560. 3
11230501 123010000 0 1 1 0.6 1
11230601 0          0 0 1 0.6 1
11230701 10220 1. 0. 0. 1
11230801 0. 10. 10. 0. 0. 0. 0. 1. 1
*
* separation between core inlet and downcommer
11250000 1 3 2 1 0.1715
11250100 0 1
11250101 2 0.1765
11250201 1 2
11250301 0 2
11250401 560. 3
11250501 125010000 0 1 1 1.054 1
11250601 119140000 0 1 1 1.054 1 * ddd
11250701 0 0. 0. 0. 1
11250801 0. 10. 10. 0. 0. 0. 0. 1. 1
11250901 0. 10. 10. 0. 0. 0. 0. 1. 1
*
* guide thimbles
*11251000 18 3 2 1 4.-3
11251000 3 3 2 1 4.-3
11251100 0 1
11251101 2 3 -3
11251201 1 2
11251301 0 2
11251401 560. 3
*11251501 123010000 0 1 1  10.2    1 * 17*0.600
*11251502 125010000 0 1 1  21.108  2 * 17*1.054 + 29*0.11
*11251503 131010000 0 1 1  15.312  3 * 29*0.528
*11251504 131020000 0 1 1   7.54  13 * 29*0.260
*11251505 131120000 0 1 1  15.312 14 * 29*0.528
*11251506 141010000 0 1 1  13.383 15 * 17*0.177 + 12*0.8645
*11251507 143010000 0 1 1  12.397 16 * 11*1.127
*11251508 145010000 0 1 1   3.335 17 *  1*3.335 - prava dolzina
*11251509 147010000 0 1 1  24.288 18 * 11*2.208 - prava dolzina
* coupled
11251501 125010000 0 1 1  84.32   1 *
17*(0.6+1.054)+29*(0.11+0.528+0.26*5)
11251502 143010000 0 1 1 103.08   2 *
29*(0.26*5+0.528)+17*0.177+12*0.8645+
*
+11*(1.127+2.208)
11251503 145010000 0 1 1   3.335  3 *  1*3.335 - prava dolzina
*
*11251601 123010000 0 1 1  10.2    1 * 17*0.600
*11251602 125010000 0 1 1  21.108  2 * 17*1.054 + 29*0.11
*11251603 131010000 0 1 1  15.312  3 * 29*0.528
*11251604 131020000 0 1 1   7.54  13 * 29*0.260
*11251605 131120000 0 1 1  15.312 14 * 29*0.528
*11251606 141010000 0 1 1  13.383 15 * 17*0.177 + 12*0.8645
*11251607 143010000 0 1 1  12.397 16 * 11*1.127
*11251608 145010000 0 1 1   3.335 17 *  1*3.335 - prava dolzina
*11251609 147010000 0 1 1  24.288 18 * 11*2.208 - prava dolzina
* coupled
11251601 125010000 0 1 1  84.32   1 *
17*(0.6+1.054)+29*(0.11+0.528+0.26*5)
11251602 143010000 0 1 1 103.08   2 *
29*(0.26*5+0.528)+17*0.177+12*0.8645+
*
+11*(1.127+2.208)
11251603 145010000 0 1 1   3.335  3 *  1*3.335 - prava dolzina
*
*11251701 0 0. 0. 0. 18
*11251801 0 0. 0. 0. 18
*11251901 0 0. 0. 0. 18
11251701 0 0. 0. 0. 3
11251801 0 10. 10. 0. 0.  0. 0.  1. 3
11251901 0 10. 10. 0. 0.  0. 0.  1. 3
*
* core baffle * cylinder approximation  * bbb
11311000 12 4 2 1 429.1437-3
11311100 0 1
11311101 3 429.7707-3
11311201 1 3
11311301 0 3
11311401 560. 4
11311501 131010000 10000 1 1 0.343  12
11311601 133010000 10000 1 1 0.343  12
11311701 0 0. 0. 0. 12
11311801 0 10. 10. 0. 0.  0. 0.  1. 12
11311901 0 10. 10. 0. 0.  0. 0.  1. 12
*
* core barrel (middle part): hh11  * bbb
11330000 12 3 2 1 0.1715
11330100 0 1
11330101 2 0.202397
11330201 1 2
11330301 1.0 2
11330401 562. 3
11330501 133010000 10000 1 1 0.3138  12
11330601 0          0     0 1 0.3138  12
11330701 10221 0.0833  0. 0. 12
11330801 0. 10. 10. 0. 0. 0. 0. 1. 12
*
* core barrel (core outlet + vessel outlet + upper plenum)
11410000 3 3 2 1 0.1715
11410100 0 1
11410101 2 0.1995
11410201 1 2
11410301 0 2
11410401 563. 3
11410501 141010000 0 1 1 0.8645 1
11410502 143010000 0 1 1 1.127  2 * outlet nozzle neglected
11410503 147010000 0 1 1 0.6465 3
11410601 0          0 0 1 0.8645 1
11410602 0          0 0 1 1.127  2
11410603 0          0 0 1 0.6465 3
11410701 0 0. 0. 0. 3
11410801 0. 10. 10. 0. 0. 0. 0. 1. 3
*
* upper core plate, upper tie plate
11411000 1 3 1 1 0.
11411100 0 1
11411101 2 4.232-3
11411201 1 2
11411301 0 2
11411401 563. 3
11411501 0          0 0 1 0.3562 1
11411601 141010000 0 1 1 0.3562 1
11411701 0 0. 0. 0. 1
11411901 0 10. 10. 0. 0.  0. 0.  1. 1
*
* tube around rcc guide tube
11430000 2 3 2 1 36.05-3
11430100 0 1
11430101 2 38.05-3
11430201 1 2
11430301 0 2
11430401 563. 3
11430501 143010000 0 1 1 0.4485 1
11430502 147010000 0 1 1 1.2515 2
11430601 143010000 0 1 1 0.4485 1
11430602 147010000 0 1 1 1.2515 2
11430701 0 0. 0. 0. 2
11430801 0. 10. 10. 0. 0. 0. 0. 1. 2
11430901 0. 10. 10. 0. 0. 0. 0. 1. 2
*
* rcc guide tube
11450000 2 4 2 1 30.15-3
11450100 0 1
11450101 3 31.75-3
11450201 1 3
11450301 0 3
11450401 563. 4
11450501 145010000 0 1 1 1.127 1
11450502 145010000 0 1 1 2.155 2
11450601 143010000 0 1 1 1.127 1
11450602 147010000 0 1 1 2.155 2
11450701 0 0. 0. 0. 2
11450801 0. 10. 10. 0. 0. 0. 0. 1. 2
11450901 0. 10. 10. 0. 0. 0. 0. 1. 2
*
* core barrel (upper plenum - upper part)
11470000 1 3 2 1 0.370907
11470100 0 1
11470101 2 0.404192
11470201 1 2
11470301 0 2
11470401 563. 3
11470501 147010000 0 1 1 0.689 1
11470601 0          0 0 1 0.689 1
11470701 0 0. 0. 0. 1
11470801 0. 10. 10. 0. 0. 0. 0. 1. 1
*
* separation between upper plenum and upper head
11471000 1 4 1 1 0.
11471100 0 1
11471101 3 31.42-3
11471201 1 3
11471301 0 3
11471401 560. 4
11471501 147010000 0 1 1 0.734 1
11471601 151010000 0 1 1 0.734 1
11471701 0 0. 0. 0. 1
11471801 0 10. 10. 0. 0.  0. 0.  1. 1
11471901 0 10. 10. 0. 0.  0. 0.  1. 1
*
* vessel upper head: hh11
11530000 1 3 1 1 0.
11530100 0 1
11530101 2 49.67-3
11530201 1 2
11530301 1.0 2
11530401 560. 3
11530501 153010000 0 1 1 1.587 1
11530601 0          0 0 1 1.587 1
11530701 10222 1. 0. 0. 1
11530801 0. 10. 10. 0. 0. 0. 0. 1. 1
*
*
*****************************************************************
*********
* rrxxccvv  control variables for pressure losses calculation -
ip     *
*****************************************************************
*********
**
```

```
*20500900 pd119-04 mult 0.5 0. 1
*20500901 rho 119040000 velf 119040000 velf 119040000
*20501000 pt119-04 sum  1.0 0. 1
*20501001 0.  1. cntrlvar 9  1. p 119040000
**
*20501300 pd123-01 mult 0.5 0. 1
*20501301 rho 123010000 velf 123010000 velf 123010000
*20501400 pt123-01 sum  1.0 0. 1
*20501401 0.  1. cntrlvar 13  1. p 123010000
**
*20501900 pg119-04 sum  9.80665 0. 1
*20501901 0.  0.10197 cntrlvar 10 -4.7570 rho 119020000
**
*20502100 pg123-01 sum  9.80665 0. 1
*20502101 0.  0.10197 cntrlvar 14 -6.2581 rho 119030000
**
*20502700 pd655-01 mult 0.5 0. 1
*20502701 rho 655010000 velf 655010000 velf 655010000
*20502800 pt655-01 sum  1.0 0. 1
*20502801 0.  1. cntrlvar 27  1. p 655010000
**
*20503500 dp119-04 sum  1.-5 0. 1
*20503501 0.  1. cntrlvar 19  -1. cntrlvar 28
**
*20503700 dp123-01 sum  1.-5 0. 1
*20503701 0.  1. cntrlvar 21  -1. cntrlvar 28
**
*20504500 pd141-01 mult 0.5 0. 1
*20504501 rho 141010000 velf 141010000 velf 141010000
*20504600 pt141-01 sum  1.0 0. 1
*20504601 0.  1. cntrlvar 45  1. p 141010000
**
*20504700 pd143-01 mult 0.5 0. 1
*20504701 rho 143010000 velf 143010000 velf 143010000
*20504800 pt143-01 sum  1.0 0. 1
*20504801 0.  1. cntrlvar 47  1. p 143010000
**
*20504900 pd603-01 mult 0.5 0. 1
*20504901 rho 603010000 velf 603010000 velf 603010000
*20505000 pt603-01 sum  1.0 0. 1
*20505001 0.  1. cntrlvar 49  1. p 603010000
**
*20505300 pg141-01 sum  9.80665 0. 1
*20505301 0.  0.10197 cntrlvar 46 -0.7059 rho 131050000
*
*20505400 pg143-01 sum  9.80665 0. 1
*20505401 0.  0.10197 cntrlvar 48 +0.0082 rho 131060000
**
*20505500 pg603-01 sum  9.80665 0. 1
*20505501 0.  0.10197 cntrlvar 50 +0.2899 rho 131060000
**
*20505800 dp141-01 sum  1.-5 0. 1
*20505801 0.  1. cntrlvar 53  -1. cntrlvar 28
**
*20505900 dp143-01 sum  1.-5 0. 1
*20505901 0.  1. cntrlvar 54  -1. cntrlvar 28
**
**20506000 dp603-01 sum  1.-5 0. 1
*20506001 0.  1. cntrlvar 55  -1. cntrlvar 28
**
*
**********************************************************************
*********
*
*
```

```
* sngg                    uparjalnik 1
*
*
*
**********************************************************************
*********
*
* prim. sistem: sg vstop
6110000 hl-sg sngljun
*! 6110101 602010000  301000000  1.0936e-02  0.57  0.46  00100
6110101 602010000  301000000  1.0936e-02  0.616  0.46  130100
6110201    0  6.36910e+00  6.57060e+00  0.00000e+00
*
* prim. sistem: sg vstopni prekat in u-cevi
3010000 sg-tube pipe
3010001 11
*! 3010101 0.04394  1  0.010342  11
3010101 0.04394  1  0.0103423  11
3010201 0  10
3010301 0.798  1  2.0  5  1.725  7  2.0  11
3010401 0  11
3010501 0  11
3010601 83.0  1  90.0  5  45.0  6  -45.0  7  -90.0  11
3010701 0.728  1  2.0  5  1.685  6  -1.685  7  -2.0  11
*! 3010801 0.1e-03  0.091  1  0.01e-03  0.01968  11
3010801 0.1e-05  0.091  1  0.01e-07  0.01968  11
*! 3010901 0.44  0.60  1  0.01  0.01  5  0.22  0.22  6  0.01
0.01  10
3010901 0.01  0.01  1  0.0  0.0  10
3011001 00 11
*! 3011101 00100  1  00000  10
3011101 100000  10
3011201 103  1.55556e+07  5.63746e+02  0.00000e+00    0  0  1
3011202 103  1.55187e+07  5.63172e+02  0.00000e+00    0  0  2
3011203 103  1.54826e+07  5.62658e+02  0.00000e+00    0  0  3
3011204 103  1.54465e+07  5.62198e+02  0.00000e+00    0  0  4
3011205 103  1.54105e+07  5.61785e+02  0.00000e+00    0  0  5
3011206 103  1.53770e+07  5.61455e+02  0.00000e+00    0  0  6
3011207 103  1.53586e+07  5.61159e+02  0.00000e+00    0  0  7
3011208 103  1.53523e+07  5.60864e+02  0.00000e+00    0  0  8
3011209 103  1.53456e+07  5.60605e+02  0.00000e+00    0  0  9
3011210 103  1.53390e+07  5.60379e+02  0.00000e+00    0  0 10
3011211 103  1.53324e+07  5.60181e+02  0.00000e+00    0  0 11
3011300 0
3011301  6.73470e+00  6.73470e+00  0.00000e+00    1
3011302  6.72540e+00  6.72540e+00  0.00000e+00    2
3011303  6.71720e+00  6.71720e+00  0.00000e+00    3
3011304  6.71000e+00  6.71000e+00  0.00000e+00    4
3011305  6.70360e+00  6.70360e+00  0.00000e+00    5
3011306  6.69850e+00  6.69850e+00  0.00000e+00    6
3011307  6.69390e+00  6.69390e+00  0.00000e+00    7
3011308  6.68910e+00  6.68910e+00  0.00000e+00    8
3011309  6.68490e+00  6.68490e+00  0.00000e+00    9
3011310  5.86580e+00  5.86580e+00  0.00000e+00   10
3011401   .01968  0.0  1.0  1.0   10
*
* prim. sistem: sg izstopni prekat
3130000  c-ch branch
3130001  1  0
*! 3130101  0.0  0.798  35.061e-03  0.0  -85.0  -0.728  0.1e-03
0.091  00
3130101  0.0  0.798  35.061e-03  0.0  -85.0  -0.728  0.1e-04
0.091  00
3130200 103  1.53426e+07  5.60188e+02
*! 3131101  301010000  313000000  0.010342  0.60  0.44  00100
3131101  301010000  313000000  0.0103423  0.3  0.2  130000
```

```
3131201  6.67810e+00  6.96410e+00  0.00000e+00
*
* prim. sistem: sg izstop
6610000 sg-cl sngljun
*! 6610101 313010000  652000000  1.0936e-02  0.46  0.57  00100
6610101 313010000  652000000  1.0936e-02  0.01  0.02  130100
6610201    0  6.31550e+00  6.53410e+00  0.00000e+00
*
*
**********************************************************************
*********
*
* sek. sistem: dvizni kanal
3030000 riser pipe
3030001 6
3030101 0.0  6
3030201 0.01291  1  0.0214    4  0.048695  5
3030301 2.0      4  2.9605    5  0.8295    6
* povecanje mase sekundarnega hladila
*++ 3030401 0.11513  4  0.17171    5  0.04041    6
3030401 0.12513  4  0.18171    5  0.04041    6
3030501 0  6
3030601 90.0  6
3030701 2.0      4  2.9605    5  0.8295    6
3030801 0.1e-03  0.03503  5  0.1e-03  0.249  6
3030901 5.46  5.46  1  3.32  3.32  4  0.1  0.1  5
3031001 00  6
3031101 100100  4  100000  5
3031201 100  6.88631e+06  1.24544e+06  2.58278e+06  6.52550e-02
0.00000e+00    1
3031202 100  6.87343e+06  1.25147e+06  2.58289e+06  1.89420e-01
0.00000e+00    2
3031203 100  6.86221e+06  1.25111e+06  2.58298e+06  2.99440e-01
0.00000e+00    3
3031204 100  6.85237e+06  1.25062e+06  2.58305e+06  3.94750e-01
0.00000e+00    4
3031205 100  6.84122e+06  1.25006e+06  2.58314e+06  4.19980e-01
0.00000e+00    5
3031206 100  6.83286e+06  1.24938e+06  2.58318e+06  4.01760e-01
0.00000e+00    6
3031300 0
3031301  4.72642e-02  2.73680e-01  0.00000e+00    1
3031302  5.13242e-02  3.89180e-01  0.00000e+00    2
3031303  5.53470e-02  4.40650e-01  0.00000e+00    3
3031304  6.06003e-02  4.89460e-01  0.00000e+00    4
3031305  7.43034e-02  7.34730e-01  0.00000e+00    5
3031401  0.027   0.0   1.0   1.0  5
*          ++
*
* sek. sistem: separator pare
3070000 separ  separatr
3070001 3  0
3070101 0.0  1.9430  0.09467  0  90.0  1.9430  0.1e-04  0.24°
00
3070200 100  6.82485e+06  1.24923e+06  2.58329e+06  1.46060e-01
3071101 307010000  310000000   4.8695e-02  0.82  0.14  01000
0.0
3072101 307000000  308000000  44.9150e-02  0.26  0.23  01000
0.0
3073101 303010000  307000000   4.8695e-02  0.0  0.0  01000
3071201 -9.27782e-02  3.06390e-01  0.00000e+00
3072201  4.68546e-03 -1.70169e-02  0.00000e+00
3073201  7.22482e-02  7.61560e-01  0.00000e+00
*
* sek. sistem: zgornji parni prostor
3100000 stmdome pipe
```

```
3100001 2
3100101 0.0  2
3100201 0.0  1
3100301 1.0800   1  0.4000    2
3100401 0.54287  1  0.134040  2
3100501  0.0  2
3100601 90.0  2
3100701 1.0800   1  0.4000    2
3100801 0.1e-03  0.8000  1  0.1e-03  0.41905  2
3100901 0.0  0.0  1
3101001 00  2
3101101 100000 1
3101201 102  6.81862e+06  1.00000e+00  0.00000e+00   0  0  1
3101202 102  6.81836e+06  1.00000e+00  0.00000e+00   0  0  2
3101300 0
3101301 -9.29183e-03  4.43804e-02  0.00000e+00   1
*
* sek. sistem: spoj uparjalnika in parovoda
3110000 sg-sl sngljun
3110101 3100,0000  320000000   0.0011401  0.222  1.0  130100
3110201   0  6.85870e+00  6.87160e+00  0.00000e+00
*
* sek. sistem: povratni kanal (zgornji obrocasti del)
3190000 udownann branch
3190001 1  0
3190101 0.0  1.9430  0.3078  0  90.0  1.9430  0.1e-03  0.1930
00
3190200 102  6.82490e+06  8.10100e-03
*3191101 310000000  319010000  0.44915  0.0  0.0  130100
3191101 310000000  319010000  0.0  0.5  0.5  130100
3191110 0.1930  0.0  1.0  1.0
3191201  3.04510e-01  3.70859e-04  0.00000e+00
*
* sek. sistem: povratni kanal (srednji obrocasti del)
3080000 mdownann branch
3080001 2  3
3080101 0.0  0.8275  0.081723  0  -90.0  -0.8275  0.1e-03
0.176  00
3080200 102  6.83412e+06  0.00000e+00
3081101 319000000  308000000  0.0  0.09  0.15  130000
*3082101 308010000  309000000  0.030415  0.0  0.0  00100
3082101 308010000  309000000  0.0  0.43  0.60  130100
3081110 0.1930  0.0  1.0  1.0
3082110 0.1760  0.0  1.0  1.0
3081201  1.78363e-04 -3.00110e-01  0.00000e+00
3082201  1.16890e-01  1.38490e-01  0.00000e+00
*
* sek. sistem: povratni kanal (spodnji cevni del)
3090000 pipedown pipe
3090001 5
3090101 0.0        5
3090201 0.0  1  0.005836  4
3090301 2.9625  1  2.0  5
3090401 0.06909  1  0.01167  4  0.01456  5
3090501    0      5
3090601 -90.0   5
3090701 -2.9625  1  -2.0  5
3090801 0.1e-03  0.05983  1  0.1e-03  0.0431  5
3090901 0.47  0.57  1  0.05  0.05  4
3091001 00  5
3091101 100100  1  100000  4
3091201 103  6.84883e+06  5.42776e+02  0.00000e+00   0  0  1
3091202 103  6.86697e+06  5.42788e+02  0.00000e+00   0  0  2
3091203 103  6.88197e+06  5.42799e+02  0.00000e+00   0  0  3
3091204 103  6.89696e+06  5.42811e+02  0.00000e+00   0  0  4
3091205 103  6.91201e+06  5.42849e+02  0.00000e+00   0  0  5
3091300 0
3091301  4.67180e-01  4.67180e-01  0.00000e+00   1
3091302  4.67090e-01  4.67090e-01  0.00000e+00   2
3091303  4.67090e-01  4.67090e-01  0.00000e+00   3
3091304  4.67080e-01  4.67080e-01  0.00000e+00   4
3091410  0.0431  0.0  1.0  1.0  4
*
*
* sek. sistem: spoj povratnega in dviznega kanala
* ni "abrupt area change" modela - regulacija recirkulacije
3350000  drs valve
3350101  309010000  303000000  0.025761  0.0  0.0  100000
3350201   0  1.05820e-01  1.44390e-01  0.00000e+00
3350300  srvviv
3350301  324
3350401  0.01     0.01      0.01  * aprto
3350402  1.0   1000.0    1000.0   * odprto
*
* ccci sg1 recirkulacija:  4x :  4 * 0.525 kg/s = 2.100 kg/s
20532400  reg335  sum  1.0  0.02846  0  3  0.01  1.0
20532401  0.0002100  -0.0001  mflowj  335000000  1.0  cntrlvar
324
*20532400  reg335  constant  1.0
*
*
************************************************************
*********
* hhss                toplotna telesa sg 1
*
************************************************************
*********
*
* u cevi
13013000  10  4  2  1  0.00984
13013100  0  1
13013101  3  0.01111
13013201  3  3
13013301  0.0  3
13013401  570.330  1  566.810  2  563.420  3  560.15  4
* prim. -->
13013501  301020000   0   1   1   68.0    1
13013502  301030000   0   1   1   68.0    2
13013503  301040000   0   1   1   68.0    3
13013504  301050000   0   1   1   68.0    4
13013505  301060000   0   1   1   58.65   5
13013506  301070000   0   1   1   58.65   6
13013507  301080000   0   1   1   68.0    7
13013508  301090000   0   1   1   68.0    8
13013509  301100000   0   1   1   68.0    9
13013510  301110000   0   1   1   68.0   10
* --> sek.
13013601  303010000   0   1   1   68.0    1
13013602  303020000   0   1   1   68.0    2
13013603  303030000   0   1   1   68.0    3
13013604  303040000   0   1   1   68.0    4
13013605  303050000   0   1   1   58.65   5
13013606  303050000   0   1   1   58.65   6
13013607  303040000   0   1   1   68.0    7
13013608  303030000   0   1   1   68.0    8
13013609  303020000   0   1   1   68.0    9
13013610  303010000   0   1   1   68.0   10
*
13013701  0  0    0    0    10
13013801  0 10. 10. 0. 0.  0. 0.  1. 10
13013901  0 10. 10. 0. 0.  0. 0.  1. 10
*
* dividing plate in channel head
13011000  1  4  1  1  0.0
13011100  0  1
13011101  3  0.012
13011201  1  3
13011301  0.0  3
13011401  597.0  1   588.0  2   570.0  3   561.0  4
13011501  301010000  0  1  0  0.26643  1
13011601  313010000  0  1  0  0.26643  1
13011701  0  0    0  0  1
13011801  0 10. 10. 0. 0.  0. 0.  1. 1
13011901  0 10. 10. 0. 0.  0. 0.  1. 1
*
* cnannel head : zunanja stena --> plosca
13012000  2  4  1  1  0.0
13012100  0  1
13012101  3  0.0598
13012201  1  3
13012301  0.0  3
13012401  597.0  1   588.0  2   570.0  3   561.0  4
13012501  301010000  0  1  0  0.40167  1
13012502  313010000  0  1  0  0.40167  2
13012601  0  0  0  0  0.40167  1
13012602  0  0  0  0  0.40167  2
13012701  0  0    0  0  2
13012801  0 10. 10. 0. 0.  0. 0.  1. 2
13012901  0 10. 10. 0. 0.  0. 0.  1. 2
*
* tubesheet
13014000  2  4  1  1  0.0
13014100  0  1
13014101  3  0.1845
13014201  1  3
13014301  0.0  3
13014401  597.0  1   588.0  2   570.0  3   561.0  4
13014501  301010000  0  1  0  0.1139  1
13014502  313010000  0  1  0  0.1139  2
13014601  309050000  0  1  0  0.1139  1
13014602  303010000  0  1  0  0.1139  2
13014701  0  0    0  0  2
13014801  0 10. 10. 0. 0.  0. 0.  1. 2
13014901  0 10. 10. 0. 0.  0. 0.  1. 2
*
* riser (brez upper cylindrical shell) --> plosca: hhll
13031000  5  4  1  1  0.0
13031100  0  1
13031101  3  0.0159
13031201  1  3
13031301  1.0  3
13031401  597.0  1   588.0  2   570.0  3   561.0  4
13031501  303010000  0  1  0  2.895  1
13031502  303020000  0  1  0  2.895  2
13031503  303030000  0  1  0  2.895  3
13031504  303040000  0  1  0  2.895  4
13031505  303050000  0  1  0  4.286  5
13031601  0  0  0  0  2.895  1
13031602  0  0  0  0  2.895  2
13031603  0  0  0  0  2.895  3
13031604  0  0  0  0  2.895  4
13031605  0  0  0  0  4.286  5
13031701  10225  0.2    0  0  5
13031801  0 10. 10. 0. 0.  0. 0.  1. 5
13031901  0 10. 10. 0. 0.  0. 0.  1. 5
*
* upper-inner cylindrical shell --> plosca
13032000  2  4  1  1  0.0
```

```
13032100  0  1
13032101  3  0.006
13032201  1  3
13032301  0.0  3
13032401  597.0  1   588.0  2   570.0  3   561.0  4
13032501  308010000  0  1  0  0.6633  1
13032502  319010000  0  1  0  1.5537  2
13032601  303060000  0  1  0  0.6633  1
13032602  307010000  0  1  0  1.5537  2
13032701  0  0    0  0  2
13032801  0 10. 10. 0. 0.  0. 0.  1. 2
13032901  0 10. 10. 0. 0.  0. 0.  1. 2
*
* upper sleve and upper head ---> plosce 13101...13104
13101000  1  4  1  1  0.0
13101100  0  1
13101101  3  0.0210
13101201  1  3
13101301  0.0  3
13101401  597.0  1   588.0  2   570.0  3   561.0  4
13101501  0  0  0  0  1.005  1
13101601  310020000  0  1  0  1.005  1
13101701  0  0    0  0  1
13101801  0 10. 10. 0. 0.  0. 0.  1. 1
13101901  0 10. 10. 0. 0.  0. 0.  1. 1
*
13102000  1  4  1  1  0.0
13102100  0  1
13102101  3  0.0258
13102201  1  3
13102301  0.0  3
13102401  597.0  1   588.0  2   570.0  3   561.0  4
13102501  0  0  0  0  3.3870  1
13102601  310010000  0  1  0  3.3870  1
13102701  0  0    0  0  1
13102801  0 10. 10. 0. 0.  0. 0.  1. 1
13102901  0 10. 10. 0. 0.  0. 0.  1. 1
*
13103000  1  4  1  1  0.0
13103100  0  1
13103101  3  0.0947
13103201  1  3
13103301  0.0  3
13103401  597.0  1   588.0  2   570.0  3   561.0  4
13103501  0  0  0  0  0.4463  1
13103601  319010000  0  1  0  0.4463  1
13103701  0  0    0  0  1
13103801  0 10. 10. 0. 0.  0. 0.  1. 1
13103901  0 10. 10. 0. 0.  0. 0.  1. 1
*
13104000  1  4  1  1  0.0
13104100  0  1
13104101  3  0.0245
13104201  1  3
13104301  0.0  3
13104401  597.0  1   588.0  2   570.0  3   561.0  4
13104501  0  0  0  0  3.2448  1
13104601  308010000  0  1  0  3.2448  1
13104701  0  0    0  0  1
13104801  0 10. 10. 0. 0.  0. 0.  1. 1
13104901  0 10. 10. 0. 0.  0. 0.  1. 1
*
* downcomer --> plosce 3091-01, 3092-01-02-03-04
13091000  1  4  1  1  0.0
13091100  0  1
13091101  3  0.00394
13091201  1  3
13091301  0.0  3
13091401  597.0  1   588.0  2   570.0  3   561.0  4
13091501  0  0  0  0  4.0116  1
13091601  309010000  0  1  0  4.0116  1
13091701  0  0    0  0  1
13091801  0 10. 10. 0. 0.  0. 0.  1. 1
13091901  0 10. 10. 0. 0.  0. 0.  1. 1
*
13092000  4  4  1  1  0.0
13092100  0  1
13092101  3  0.00276
13092201  1  3
13092301  0.0  3
13092401  597.0  1   588.0  2   570.0  3   561.0  4
13092501  0  0  0  0  1.2028  1
13092502  0  0  0  0  1.2028  2
13092503  0  0  0  0  1.2028  3
13092504  0  0  0  0  1.2028  4
13092601  309020000  0  1  0  1.2028  1
13092602  309030000  0  1  0  1.2028  2
13092603  309040000  0  1  0  1.2028  3
13092604  309050000  0  1  0  1.2028  4
13092701  0  0    0  0  4
13092801  0 10. 10. 0. 0.  0. 0.  1. 4
13092901  0 10. 10. 0. 0.  0. 0.  1. 4
*
*
************************************************************
*********
* ssggccvv              sg 1 kontrolne spremenljivke
*
************************************************************
*********
*
* cv 303: sg1: nivo v povratnem kanalu [m]
20530300  levdc  sum  1.0  13.45  1
20530301  0.0  2.0    voidf 309050000  2.0    voidf  309040000
20530302       2.0    voidf 309030000  2.0    voidf  309020000
20530303       2.9625 voidf 309010000  0.8275 voidf  308010000
20530304       1.9430 voidf 319010000
*
* cv 305: sg1: masa sekundarnega hladila [kg]
20530500  ssgmass  sum  1.0  790.0  1
*++ 20530501  0.0  0.11513  rho 303010000  0.11513  rho
303020000
*++ 20530502       0.11513  rho 303030000  0.11513  rho
303040000
*++ 20530503       0.17171  rho 303050000  0.04041  rho
303060000
20530501  0.0  0.12513  rho 303010000  0.12513  rho 303020000
20530502       0.12513  rho 303030000  0.12513  rho 303040000
20530503       0.18171  rho 303050000  0.04041  rho 303060000
20530504       0.09466  rho 307010000  0.54287  rho 310010000
20530505       0.13404  rho 310020000  0.30780  rho 319010000
20530506       0.08172  rho 308010000  0.06909  rho 309010000
20530507       0.01167  rho 309020000  0.01167  rho 309030000
20530508       0.01167  rho 309040000  0.01456  rho 309050000
*
*
************************************************************
*********
* mmff                  main feedwater 1
*
************************************************************
*********
*
* konstantni mfw tok
*
3340000 mfw tmdpjun
3340101 331000000  332000000  0.0266
3340200 1  505  * si
3340201 -1.0  0.52517   0.  0.
3340202  0.0  0.52517   0.  0.
3340203  6.0  0.0       0.  0.
*
* volumski mfw tok
*20530200   vmfw  div  1.0   0.0   1
*20530201   rhof  332010000  mflowj  332010000
*
* feedwater line
3320000 fwline branch
3320001 1  0
3320101 5.557e-04  10.0  0  0  60.0  7.0  0.01e-03  0.0266  00
3320200 103  6.86271e+06  4.90974e+02
*3321101 332010000 308000000  0.0006786  0.  0.  00100
3321101 332010000 308000000  0.0  1.0  0.  130100
3321201  1.11560e+00  1.1156de+00  0.00000e+00
*
* vir napajalne vode
3310000 fwsource tmdpvol
3310101 1.0  0.0  10.0  0  0  0  0.01e-03  0.0  00
3310200 103
3310201 0  70.0+5  491.0
*
************************************************************
*********
*
* ccci "regulacija" sg1 nivoja
* ob konstantni mfw 334 reguliramo nivo v povratnem kanalu
*
3290000 v329 tmdpvol
3290101 1.0  0.0  10.0  0.0  0.0  0.0  0.2e-03  0.0  0
3290200 103
3290201 0  70.0+5  491.0
*
3300000 j330 tmdpjun
3300101 329000000  319010000  0.0
3300200 1  0  cntrlvar 303   * sg level
3300201  -1.0      0.0       0.0   0.0
3300202  13.35     1.5       0.0   0.0
3300203  13.45     0.0       0.0   0.0
3300204  13.55    -1.5       0.0   0.0
*
*3300000 j330 tmdpjun
*3300101 329000000  319010000  0.0
*3300200 1  0  cntrlvar 305   * sg mass
*3300201  -1.0      0.0       0.0   0.0
*3300202  790.0     1.5       0.0   0.0
*3300203  800.0     0.0       0.0   0.0
*3300204  810.0    -0.50      0.0   0.0
*
*
************************************************************
*********
* ssll                        parovod 1
*
************************************************************
*********
*
* steam line from porv+sv+msiv
32C0000 stmline  snglvol
```

```
3200101 0.0  31.65  68.5e-03  0  -45.C  -18.670  0.01-3  0.0525
00
3200200 102  6.81250e+06  1.00000e+00
*
* hhss
* 13201000  1  4  2  1  0.0525
13201000  1  4  2  0  0.0525  * ff11
13201100  0  1
13201101  3  0.0603
13201201  1  3
13201301  0.0  3
13201401  570.330  1  566.810  2  563.420  3  560.15  4
13201501  320010000   0   1   1   31.65   1
13201601  0  0  0  1  31.65  1
13201701  0  0    0    0    1
13201801  0 10. 10. 0. 0.  0. 0.  1. 1
13201901  0 10. 10. 0. 0.  0. 0.  1. 1
*
*
*****************************************************************
*********
* ccci    regulacija tcold 1 preko tlaka sekundarne strani
*
*****************************************************************
*********
*
* delta tcold : bethsy referenca : 559.85 k
20530000  dtcold  sum  1.0  0.0  0
20530001  560.35  -1.0  tempf  655010000
* 20530001  559.35  -1.0  tempf  655010000  * !#
*
20534400  p344  sum  1.0  68.12e+05  0
20534401  0.0  1.0  p  344010000  300.  cntrlvar 300
*
3150000  venturi  snglju.
3150101  320010000  344000000  0.0  0.0  0.0  130000
3150201   0  6.89710e+00  6.89710e+00  0.00000e+00
*
3440000  turbine  tmdpvol
3440101  10.0  0.0  1000.0  0  0.0  0  0.2e-03  0  0
3440200  2  0  cntrlvar 344
3440201   -1.0        68.12e+05  1.0
3440202    1.0e+05    1.0e+05    1.0
3440203  100.0e+05  100.0e+05    1.0
*
*
*****************************************************************
****-****
* rrccss              cevovodi primarnega kroga 1
*
*****************************************************************
*********
*
* * prim. sistem: hot leg do surge line
* 6030000 hleg  snglvol
* 6030101 0.010936  1.4441  0.0  0.0  0.0  0.0  0.1e-03  0.1180
00
* 6030200 103  1.55957e+07  5.63790e+02
*
6030000 hleg  pipe
6030001 5
6030101 0.010936 5
6030201 0.010936 4
6030301 0.28882  5
6030401 0.0  5
6030501 0.0  5
6030601 0.0  5
6030701 0.0  5
6030801 0.1e-03  0.1180  5
6030901 0.0  0.0  4
6031001 00    5
6031101 100000  4  *fvcahs:v=0
*                  should be input as not used
6031201 103  1.55941e+07  5.63762e+02  0.00000e+00   0  0  1
6031202 103  1.55934e+07  5.63762e+02  0.00000e+00   0  0  2
6031203 103  1.55927e+07  5.63762e+02  0.00000e+00   0  0  3
6031204 103  1.55920e+07  5.63762e+02  0.00000e+00   0  0  4
6031205 103  1.55913e+07  5.63762e+02  0.00000e+00   0  0  5
6031300 0
6031301  6.36880e+00  6.36880e+00  0.00000e+00   1
6031302  6.36880e+00  6.36880e+00  0.00000e+00   2
6031303  6.36880e+00  6.36880e+00  0.00000e+00   3
6031304  6.36880e+00  6.36880e+00  0.00000e+00   4
*
* prim. sistem: hot leg spoj pri sl
6130000 hl613 snglju.n
*! 6130101 603010000  602000000  0.0  0.0  0.0  00000
6130101 603010000  602000000  0.0  0.265  0.265  130000
6130201   0  6.36880e+00  6.36880e+00  0.00000e+00
*
* * prim. sistem: hot leg od sl do sg
* 6020000 hleg  pipe
* 6020001 2
* 6020101 0.010936 2
* 6020201 0.010936 1
* 6020301 1.1891  1  1.8558  2
* 6020401 0.0  2
* 6020501 0.0  2
* 6020601 9.0  1  70.0  2
* 6020701 0.1800  1  1.7317  2
* 6020801 0.1e-03  0.1180  2
* *! 6020901 0.31  0.31  1
* 6020901 0.24  0.24  1
* 6021001 00    2
* 6021101 100000  1
* 6021201 103  1.55880e+07  5.63790e+02  0.00000e+00   0  0  1
* 6021202 103  1.55738e+07  5.63790e+02  0.00000e+00   0  0  2
* 6021300 0
* 6021301  6.29880e+00  6.29880e+00  0.00000e+00   1
*
6020000 hleg  pipe
6020001 10
6020101 0.010936 10
6020201 0.010936  9
6020301 0.23782   5  0.37116  10
6020401 0.0  10
6020501 0.0  10
6020601 9.0  5  70.0  10
6020701 0.036  5  0.3461   10   * ++
6020801 0.1e-03  0.1180    10
6020901 0 0267  0.0267  9
6021001 00    10
6021101 100000 5  100000  9    * v=0
6021201 103  1.55866e+07  5.63760e+02  0.00000e+00   0  0  1
6021202 103  1.55853e+07  5.63760e+02  0.00000e+00   0  0  2
6021203 103  1.55841e+07  5.63760e+02  0.00000e+00   0  0  3
6021204 103  1.55828e+07  5.63759e+02  0.00000e+00   0  0  4
6021205 103  1.55816e+07  5.63759e+02  0.00000e+00   0  0  5
6021206 103  1.55791e+07  5.63758e+02  0.00000e+00   0  0  6
6021207 103  1.55752e+07  5.63757e+02  0.00000e+00   0  0  7
6021208 103  1.55714e+07  5.63756e+02  0.00000e+00   0  0  8
6021209 103  1.55676e+07  5.63755e+02  0.00000e+00   0  0  9
6021210 103  1.55637e+07  5.63754e+02  0.00000e+00   0  0 10
6021300 0
6021301  6.36890e+00  6.36890e+00  0.00000e+00   1
6021302  6.36890e+00  6.36890e+00  0.00000e+00   2
6021303  6.36890e+00  6.36890e+00  0.00000e+00   3
6021304  6.36890e+00  6.36890e+00  0.00000e+00   4
6021305  6.36890e+00  6.36890e+00  0.00000e+00   5
6021306  6.36890e+00  6.64680e+00  0.00000e+00   6
6021307  6.36900e+00  6.64680e+00  0.00000e+00   7
6021308  6.36900e+00  6.64690e+00  0.00000e+00   8
6021309  6.36900e+00  6.64700e+00  0.00000e+00   9
*
*****************************************************************
*********
* sg
*****************************************************************
*********
*
* * prim. sistem: intermediate leg down
* 6520000 ileg_a  pipe
* 6520001 2
* 6520101 0.010936  2
* 6520201 0.010936  1
* 6520301 2.5122  1  2.0697  2
* 6520401 0.0  2
* 6520501 0.0  2
* 6520601 -76.0  1  -72.0  2
* 6520701 -2.4337  1  -1.9670  2
* *! 6520801 0.1e-03  0.1180  2
* 6520801 0.1e-04  0.1180  2
* *! 6520901 0.11  0.11  1
* 6520901 0.1  0.1  1
* 6521001 00  2
* 6521101 100000  1
* 6521201 103  1.53406e+07  5.60220e+02  0.00000e+00   0  0  1
* 6521202 103  1.53517e+07  5.60220e+02  0.00000e+00   0  0  2
* 6521300 0
* 6521301  6.24600e+00  6.24600e+00  0.00000e+00   1
*
6520000 ileg_a  pipe
6520001 10
6520101 0.010936  10
6520201 0.010936  9
6520301 0.50244  5  0.41394  10
6520401 0.0  10
6520501 0.0  10
6520601 -76.0  5  -72.0  10
6520701 -0.48674  5  -0.39340  10   *++
*! 6520801 0.1e-03  0.1180  10
6520801 0.1e-04  0.1180  10
*! 6520901 0.11  0.11  9
6520901 0.011  0.011  9
6521001 00  10
6521101 100000  9
6521201 103  1.53270e+07  5.60182e+02  0.00000e+00   0  0  1
6521202 103  1.53296e+07  5.60183e+02  0.00000e+00   0  0  2
6521203 103  1.53322e+07  5.60185e+02  0.00000e+00   0  0  3
6521204 103  1.53348e+07  5.60186e+02  0.00000e+00   0  0  4
6521205 103  1.53374e+07  5.60187e+02  0.00000e+00   0  0  5
6521206 103  1.53397e+07  5.60188e+02  0.00000e+00   0  0  6
6521207 103  1.53417e+07  5.60189e+02  0.00000e+00   0  0  7
6521208 103  1.53438e+07  5.60190e+02  0.00000e+00   0  0  8
6521209 103  1.53458e+07  5.60190e+02  0.00000e+00   0  0  9
6521210 103  1.53479e+07  5.60191e+02  0.00000e+00   0  0 10
6521300 0
6521301  6.31560e+00  6.59530e+00  0.00000e+00   1
```

```
6521302  6.31560e+00  6.59520e+00  0.00000e+00   2
6521303  6.31560e+00  6.59520e+00  0.00000e+00   3
6521304  6.31560e+00  6.59510e+00  0.00000e+00   4
6521305  6.31560e+00  6.59510e+00  0.00000e+00   5
6521306  6.31560e+00  6.59510e+00  0.00000e+00   6
6521307  6.31550e+00  6.59500e+00  0.00000e+00   7
6521308  6.31550e+00  6.59500e+00  0.00000e+00   8
6521309  6.31550e+00  6.59500e+00  0.00000e+00   9
*
6630000 jun663 sngljun
*! 6630101 652010000  653000000  0.0  0.20  0.20  130000
6630101 652010000  653000000  0.0  0.0  0.0  130000
6630201    0  6.31550e+00  6.59490e+00  0.00000e+00
*
* * prim. sistem: intermediate leg
* 6530000  ileg_b  snglvol
* 6530101 0.010936  1.1027  0.0  0.0  9.0  0.180  0.1e-03
0.1180  00
* 6530200 103  1.53553e+07  5.60220e+02
*
6530000 ileg_b  pipe
6530001 5
6530101 0.010936 5
6530201 0.010936 4
6530301 0.22054  5
6530401 0.0  5
6530501 0.0  5
6530601 9.0  5
6530701 0.036  5
6530801 0.1e-03  0.1180  5
6530901 0.0  0.0  4
6531001 00    5
6531101 100000  4  *fvcahs:v=0
*                    should be input as not used
6531201 103  1.53486e+07  5.60192e+02  0.00000e+00   0  0  1
6531202 103  1.53478e+07  5.60192e+02  0.00000e+00   0  0  2
6531203 103  1.53470e+07  5.60191e+02  0.00000e+00   0  0  3
6531204 103  1.53462e+07  5.60191e+02  0.00000e+00   0  0  4
6531205 103  1.53454e+07  5.60191e+02  0.00000e+00   0  0  5
6531300 0
6531301  6.31550e+00  6.31550e+00  0.00000e+00   1
6531302  6.31550e+00  6.31550e+00  0.00000e+00   2
6531303  6.31550e+00  6.31550e+00  0.00000e+00   3
6531304  6.31550e+00  6.31550e+00  0.00000e+00   4
*
6640000 jun664 sngljun
*! 6640101 653010000  654000000  0.0  0.20  0.20  130000
6640101 653010000  654000000  0.0  0.0  0.0  130000
6640201    0  6.31550e+00  6.31550e+00  0.00000e+00
*
* * prim. sistem: intermediate leg up
* 6540000  ileg_c  snglvol
* *6540101 0.010936  1.7870  0.0  0.0  90.0  1.7870  0.1e-03
0.1180  00
* 6540101 0.010936  1.7871  0.0  0.0  90.0  1.7871  0.1e-03
0.1180  00
* *++ podaljsek 0.1 mm zaradi sklenitve rcs elevacij v rx
(napaka baze pod.)
* 6540200 103  1.53447e+07  5.60220e+02
*
6540000 ileg_c  pipe
6540001 5
6540101 0.010936 5
6540201 0.010936 4
6540301 0.35742  5
6540401 0.0  5
6540501 0.0  5
6540601 90.0  5
6540701 0.35742  5
6540801 0.1e-03  0.1180  5
6540901 0.0  0.0  4
6541001 00    5
6541101 100000  4  *fvcahs:v=0
*                    should be input as not used
6541201 103  1.53433e+07  5.60191e+02  0.00000e+00   0  0  1
6541202 103  1.53398e+07  5.60190e+02  0.00000e+00   0  0  2
6541203 103  1.53363e+07  5.60189e+02  0.00000e+00   0  0  3
6541204 103  1.53328e+07  5.60188e+02  0.00000e+00   0  0  4
6541205 103  1.53293e+07  5.60187e+02  0.00000e+00   0  0  5
6541300 0
6541301  6.31560e+00  6.59500e+00  0.00000e+00   1
6541302  6.31560e+00  6.59510e+00  0.00000e+00   2
6541303  6.31560e+00  6.59520e+00  0.00000e+00   3
6541304  6.31560e+00  6.59520e+00  0.00000e+00   4
*
*
*****************************************************************
*********
*                              rcp-1
RCP+ *
*****************************************************************
*********
*
6000000 in1 branch
6000001 1  0
6000101 0.010936  0.232  0.0  0.0  90.0  0.232  0.01e-04  0.118
00
6000200 100  1.56151e+07  1.24842e+06  2.44514e+06  0.00000e+00
6001101 654010000 600000000  0.0  0.0  0.0  130000
6001201 6.31570e+00  6.59530e+00  0.00000e+00
*
* pump loop 1
7010000  pump1 pump
7010101  0.0  0.097  14.0628e-03  0.0  60.0  0.084  00
7010108  600010000  0.  0.47  0.49  100000  *++ upor ustavljene
crpalke 7
7010109  601000000  0.  0.49  0.47  100000
7010200    0  1.56151e+07  1.24842e+06  2.44514e+06  0.00000e+00
7010201    0  6.31570e+00  6.59530e+00  0.00000e+00
7010202    0  1.06000e+00  1.06000e+00  0.00000e+00
* pump index and option card
7010301  -2  0  -2  -1  0  505  0    * trip 505: si -> pump 1
stop
* pump description card
*! 7010302  311.0  1.0  0.063056  78.0  0.0
7010302  311.0  1.0  0.067539  78.0  0.0
* 7010302  311.0  1.0  0.068797 78.0  0.0    * 18
7010303  5.0  751.0  0.0  0.0  74.39  71.39  0.0  *++ rated
density
* mh  two phase pump head multiplier tables
7013000  0  0.0  0.0,  0.2  0.0,  0.4  1.0,  0.9  1.0,  1.0
0.0
* mt  two phase pump torque multiplier tables
7013100  0  0.0  0.0,  0.2  0.0,  0.4  1.0,  0.9  1.0,  1.0
0.0
*
* pump velocity table (rad/s)
7016100  505
7016101  300.0  311.0
7016102  305.0  201.0   310.0  141.1
7016103  320.0  113.1   330.0   88.0
7016104  340.0   75.4   350.0   62.8
7016105  370.0   4  1   400.0   37.7
7016106  500.0   22.0   700.0   15.7
7016107  916.0   10.5   917.0    0.0
*
*
6010000 out1 branch
6010001 1  0
6010101 0.0  0.084  5.460e-03  0.0  -90.0  -0.084  0.C1e-04
0.0  00
6010200 100  1.56151e+07  1.24842e+06  2.44514e+06  0.00000e+00
6011101 601010000 655000000  0.0  0.0  0.0  130000
6011201 6.31570e+00  6.59530e+00  0.00000e+00
*
*
*****************************************************************
*********
*
* hh11-hhas  rcp1
17010000  1  3  1  1  0.0
17010100  0  1
17010101  2  0.1
17010201  1  2
17010301  1.0  2
17010401  560.0  3
17010501  701010000  0  1  1  1.0  1
17010601  0           0  0  1  1.0  1
17010701  10701  1.0  0.0  0.0  1
17010801  0. 10. 10. 0. 0. 0. 0. 1. 1
*
* cv 701: toplotne izgube - rcp 1,2,3
20570100  rcp1hl  function  1.0  0.0  1  3  -25000.0  0.0
20570101  time 0  701
*
20270100  reac-t  505   * si :rcp trip
20270101   -1.0  -25000.0
20270102    0.0  -25000.0
20270103  300.0   -4000.0
*
*
*****************************************************************
*********
*
* prim. sistem: cold leg a
6550000 cleg_a branch
6550001 1  0
*! 6550101 0.010936  1.8656  0.0  0.0  0.0  0.0  0.1e-03
0.1180  00
* 6550101 0.010936  1.8656  0.0  0.0  0.0  0.0  0.1e-04  0.1180
00
* 6550101 0.010936  0.332  0.0  0.0  0.0  0.0  0.1e-04  0.1180
00    * R+
6550101 0.010936  0.20763  0.0  0.0  0.0  0.0  0.1e-04  0.1180
00    * RCP+
6550200 103  1.58753e+07  5.60350e+02
*! 6551101 655010000  656000000  0.0  0.07  0.07  00000
6551101 655010000 656000000  0.0  0.002  0.002  130000
6551201  6.31100e+00  6.31100e+00  0.00000e+00
*
* * prim. sistem: cold leg b
* 6560000 cleg_b  snglvol
* *! 6560101 0.010936  1.8656  0.0  0.0  0.0  0.0  0.1e-03
0.1180  00
* 6560101 0.010936  1.8656  0.0  0.0  0.0  0.0  0.1e-04  0.1180
00
* 6560200 103  1.58875e+07  5.60350e+02
*
```

```
6560000 cleg_b  pipe     * R+
6560001 9
6560101 0.010936 9
6560201 0.010936 8
6560301 0.3777  9
6560401 0.0  9
6560501 0.0  9
6560601 0.0  9
6560701 0.0  9
6560801 0.1e-03  0.1180  9
6560901 0.0  0.0  8
6561001 00    9
6561101 100000  8  *fvcahs:v+G
*                  should be input as not used
6561201 103  1.58745e+07  5.60350e+02  0.00000e+00   0  0  1
6561202 103  1.58736e+07  5.60349e+02  0.00000e+00   0  0  2
6561203 103  1.58727e+07  5.60349e+02  0.00000e+00   0  0  3
6561204 103  1.58718e+07  5.60349e+02  0.00000e+00   0  0  4
6561205 103  1.58709e+07  5.60349e+02  0.00000e+00   0  0  5
6561206 103  1.58700e+07  5.60349e+02  0.00000e+00   0  0  6
6561207 103  1.58691e+07  5.60349e+02  0.00000e+00   0  0  7
6561208 103  1.58682e+07  5.60349e+02  0.00000e+00   0  0  8
6561209 103  1.58673e+07  5.60349e+02  0.00000e+00   0  0  9
6561300 0
6561301  6.31100e+00  6.31100e+00  0.00000e+00   1
6561302  6.31100e+00  6.31100e+00  0.00000e+00   2
6561303  6.31100e+00  6.31100e+00  0.00000e+00   3
6561304  6.31100e+00  6.31100e+00  0.00000e+00   4
6561305  6.31100e+00  6.31100e+00  0.00000e+00   5
6561306  6.31100e+00  6.31100e+00  0.00000e+00   6
6561307  6.31100e+00  6.31100e+00  0.00000e+00   7
6561308  6.31100e+00  6.31100e+00  0.00000e+00   8
*
*************************************************************
*********
* hhss            toplotna telesa - primarni cevovod 1
*
*************************************************************
*********
*
* vsa toplotna telesa primarnih cevovodov so poenostavljena v
plosce
*
* * hot leg - cev s prirobnicami: hhll
* 16021000  3  4  1  1  0.0
* 16021100  0  1
* 16021101  3  0.0286
* 16021201  1  3
* 16021301  1.0  3
* 16021401  597.0  1   588.0  2   570.0  3   561.0  4
* 16021501  603010000  0  1  0  0.5353  1
* 16021502  602010000  0  1  0  0.4408  2
* 16021503  602020000  0  1  0  0.6879  3
* 16021601  0  0  0  0  0.5353  1
* 16021602  0  0  0  0  0.4408  2
* 16021603  0  0  0  0  0.6879  3
* 16021701  10226  0.333  0  0  3
* 16021801  0 10. 10. 0. 0.  0. 0.  1. 3
* 16021901  0 10. 10. 0. 0.  0. 0.  1. 3
*
* hot leg - cev s prirobnicami: hhll
16021000  15  4  1  1  0.0
16021100  0  1
16021101  3  0.0286
16021201  1  3
16021301  1.0  3
16021401  597.0  1   588.0  2   570.0  3   561.0  4
16021501  603010000  10000  1  0  0.1070   5
16021502  602010000  10000  1  0  0.0881  10
16021503  602060000  10000  1  0  0.1376  15
16021601  0  0  0  0  0.1070   5
16021602  0  0  0  0  0.0881  10
16021603  0  0  0  0  0.1376  15
16021701  10226  0.0667  0  0  15
16021801  0 10. 10. 0. 0.  0. 0.  1. 15
16021901  0 10. 10. 0. 0.  0. 0.  1. 15
*
* * intermediate leg - cev s prirobnicami: hhll
* 16521000  4  4  1  1  0.0
* 16521100  0  1
* 16521101  3  0.0226
* 16521201  1  3
* 16521301  1.0  3
* 16521401  597.0  1   588.0  2   570.0  3   561.0  4
* 16521501  652010000  0  1  0  0.9313  1
* 16521502  652020000  0  1  0  0.7673  2
* 16521503  653010000  0  1  0  0.4088  3
* 16521504  654010000  0  1  0  0.6625  4
* 16521601  0  0  0  0  0.9313  1
* 16521602  0  0  0  0  0.7673  2
* 16521603  0  0  0  0  0.4088  3
* 16521604  0  0  0  0  0.6625  4
* 16521701  10224  0.166  0  0  4
* 16521801  0 10. 10. 0. 0.  0. 0.  1. 4
* 16521901  0 10. 10. 0. 0.  0. 0.  1. 4
*
* intermediate leg - cev s prirobnicami: hhll
16521000  20  4  1  1  0.0
16521100  0  1
16521101  3  0.0226
16521201  1  3
16521301  1.0  3
16521401  597.0  1   588.0  2   570.0  3   561.0  4
16521501  652010000  10000  1  0  0.1863   5
16521502  652060000  10000  1  0  0.1535  10
16521503  653010000  10000  1  0  0.0818  15
16521504  654010000  10000  1  0  0.1325  20
16521601  0  0  0  0  0.1863   5
16521602  0  0  0  0  0.1535  10
16521603  0  0  0  0  0.0818  15
16521604  0  0  0  0  0.1325  20
16521701  10224  0.0332  0  0  20
16521801  0 10. 10. 0. 0.  0. 0.  1. 20
16521901  0 10. 10. 0. 0.  0. 0.  1. 20
*
* * cold leg - cev s prirobnicami: hhll
* 16551000  2  4  1  1  0.0
* 16551100  0  1
* 16551101  3  0.0279
* 16551201  1  3
* 16551301  1.0  3
* 16551401  597.0  1   588.0  2   570.0  3   561.0  4
* 16551501  655010000  0  1  0  0.6915  1
* 16551502  656010000  0  1  0  0.6915  2
* 16551601  0  0  0  0  0.6915  1
* 16551602  0  0  0  0  0.6915  2
* 16551701  10224  0.166  0  0  2
* 16551801  0 10. 10. 0. 0.  0. 0.  1. 2
* 16551901  0 10. 10. 0. 0.  0. 0.  1. 2
*
* cold leg - cev s prirobnicami: hhll
16551000  10  4  1  1  0.0
16551100  0  1
16551101  3  0.0279
16551201  1  3
16551301  1.0  3
16551401  597.0  1   588.0  2   570.0  3   561.0  4
16551501  655010000       0  1  0  0.1383   1
16551502  656010000  10000  1  0  0.1383  10   * R+
16551601  0  0  0  0  0.1383   1
16551602  0  0  0  0  0.1383  10
16551701  10224  0.0332  0  0  10
16551801  0 10. 10. 0. 0.  0. 0.  1. 10
16551901  0 10. 10. 0. 0.  0. 0.  1. 10
*
*
*************************************************************
*********
* ddhh1 :        dh korekcija nekaterih rcs1 tlacnih zaznaval
*
*************************************************************
*********
*
* cv 620 : dh korigirano tlacno zaznavalo 602-10 [pa]
20562000  pk60202  sum  9.8067  0.0  1
20562001  0.0  0.10197 p 602100000  -0.15 rho 602100000  * R+
*
* cv 621 : dh korigirano tlacno zaznavalo 301-06 [pa]
20562100  ph30106  sum  9.8067  0.0  1
20562101  0.0  0.10197 p 301060000  -0.8425 rho 301060000
*
* cv 622 : dh korigirano tlacno zaznavalo 652-01 [pa]
20562200  pk65201  sum  9.8067  0.0  1
20562201  0.0  0.10197 p 652010000  -0.15 rho 652010000  * R+
*
* cv 623 : dh korigirano tlacno zaznavalo 652-10 [pa]
20562300  pk65202  sum  9.8067  0.0  1
20562301  0.0  0.10197 p 652100000  -0.15 rho 652100000  * R+
*
* cv 624 : dh korigirano tlacno zaznavalo 654-05 [pa]
20562400  pk65401  sum  9.8067  0.0  1
20562401  0.0  0.10197 p 654050000  -0.15 rho 654050000  * R+
*
*
*************************************************************
**********
** ccvvii        dpmeasured - gravity term - zanka 1
*
*************************************************************
**********
**
** ta blok cv je uporabljan med rcs1 dp inicializacijo
** upostevane so vse dh korekcije tlacnih zaznaval
**
**
** cv 630 : dp11h [bar]
*20563000  dp11h  sum  1.0e-05  -0.0763  0
*20563001  0.0  1.0 p 602010000  -1.0 p 603010000  * dh+0.0m
**
**
** cv 631 : dp11v [bar]
*20563100  dp11v  sum  1.0e-05  -0.0792  0
**20563101  0.0  1.0 p 602020000  -1.0 p 602010000  1.0
cntrlvar 632
*20563101  0.0  1.0 cntrlvar 620  -1.0 p 602010000  1.0
cntrlvar 632
**
** cv 632 : dp11v gravity term [pa]
```

```
*20563200  dpgt  sum  9.8067  0.0  1
*20563201  0.0  1.7317  rho  602010000
**
**
** cv 633 : dp41 [bar]
*20563300  dp41  sum  1.0e-05  -0.0562  0
**20563301  0.0  1.0 p 301010000  -1.0 p 602020000  1.0
cntrlvar 634
*20563301  0.0  1.0 p 301010000  -1.0 cntrlvar 620  1.0
cntrlvar 634
**
** cv 634 : dp41 gravity term [pa]
*20563400  dpgt  sum  9.8067  0.0  1
*20563401  0.0  0.364  rho  602020000
**
**
** cv 635 : hot leg dp [bar]
*20563500  hldp  sum  1.0e-05  -0.2117  0
*20563501  0.0  1.0 p 301010000  -1.0 p 603010000  1.0 cntrlvar
636
**
** cv 636 : hldp gravity term [pa]
*20563600  dpgt  sum  9.8067  0.0  1
*20563601  0.0  2.0957  rho  602010000
**
**
** cv 637 : dp42x [bar]
*20563700  dp42x  sum  1.0e-05  -1.1424  0
**20563701  0.0  1.0 p 301060000  -1.0 p 301010000  1.0
cntrlvar 638
*20563701  0.0  1.0 cntrlvar 621  -1.0 p 301010000  1.0
cntrlvar 638
**
** cv 638 : dp42x gravity term [pa]
*20563800  dpgt  sum  9.8067  0.0  1
*20563801  0.0  9.2065  rho  301020000
**
**
** cv 639 : dp43x [bar]
*20563900  dp43x  sum  1.0e-05  -0.9681  0
**20563901  0.0  1.0 p 313010000  -1.0 p 301060000  1.0
cntrlvar 640
*20563901  0.0  1.0 p 313010000  -1.0 cntrlvar 621  1.0
cntrlvar 640
**
** cv 640 : dp43x gravity term [pa]
*20564000  dpgt  sum  9.8067  0.0  1
*20564001  0.0  -9.2065  rho  301080000
**
**
** cv 641 : steam genarator dp [bar]
*20564100  sgdp  sum  1.0e-05  -2.1105  0
*20564101  0.0  1.0 p 313010000  -1.0 p 301010000  * dh=0.0m
**
**
** cv 642 : dp44 [bar]
*20564200  dp44  sum  1.0e-05  -0.1801  0
**20564201  0.0  1.0 p 652010000  -1.0 p 313010000  1.0
cntrlvar 643
*20564201  0.0  1.0 cntrlvar 622  -1.0 p 313010000  1.0
cntrlvar 643
**
** cv 643 : dp44 gravity term [pa]
*20564300  dpgt  sum  9.8067  0.0  1
*20564301  0.0  -0.364  rho  652010000
**
**
** cv 644 : dp12vg [bar]
*20564400  dp12vg  sum  1.0e-05  -0.0576  0
**20564401  0.0  1.0 p 652020000  -1.0 p 652010000  1.0
cntrlvar 645
*20564401  0.0  1.0 cntrlvar 623  -1.0 cntrlvar 622  1.0
cntrlvar 645
**
** cv 645 : dp12vg gravity term [pa]
*20564500  dpgt  sum  9.8067  0.0  1
*20564501  0.0  -4.4007  rho  652020000
**
**
** cv 646 : dp12vp [bar]
*20564600  dp12vp  sum  1.0e-05  -0.0634  0
**20564601  0.0  1.0 p 654010000  -1.0 p 652020000  1.0
cntrlvar 647
*20564601  0.0  1.0 cntrlvar 624  -1.0 cntrlvar 623  1.0
cntrlvar 647
**
** cv 647 : dp12vp gravity term [pa]
*20564700  dpgt  sum  9.8067  0.0  1
*20564701  0.0  1.967  rho  653010000
**
**
** cv 648 : intermediate leg dp [bar]
*20564800  ildp  sum  1.0e-05  -0.3011  0
**20564801  0.0  1.0 p $54010000  -1.0 p 313010000  1.0
cntrlvar 649
*20564801  0.0  1.0 cntrlvar 624  -1.0 p 313010000  1.0
cntrlvar 649
**
** cv 649 : ildp gravity term [pa]
*20564900  dpgt  sum  9.8067  0.0  1
*20564901  0.0  -2.797  rho  652020000
**
**
** cv 650 : dp12p [bar]
*20565000  dp12p  sum  1.0e-05  0.0  1
**20565001  0.0  1.0 p 655010000  -1.0 p 654010000  1.0
cntrlvar 651
*20565001  0.0  1.0 p 655010000  -1.0 cntrlvar 624  1.0
cntrlvar 651
**
** cv 651 : dp12p gravity term [pa]
*20565100  dpgt  sum  9.8067  0.0  1
*20565101  0.0  0.232  rho  654010000
**
**
** cv 652 : dp13h [bar]
*20565200  dp13h  sum  1.0e-05  -0.0303  0
*20565201  0.0  1.0 p 656010000  -1.0 p 655010000  * dh=0.0m
**
**
************************************************************
*********
*
*
* ssgg                    uparjalnik 2
*
*
*
************************************************************
*********
*
* prim. sistem: sg vstop
8110000 hl-sg snqljun
*! 8110101 802010000  401000000  1.0936e-02  0.57  0.46  00100
8110101 802010000  401000000  1.0936e-02  0.616  0.46  130100
8110201   0  6.36790e+00  6.56940e+00  0.00000e+00
*
* prim. sistem: sg vstopni prekat in u-cevi
4010000 sg-tube pipe
4010001 11
*! 4010101 0.04394  1  0.010342  11
4010101 0.04394  1  0.0103423  11
4010201 0  10
4010301 0.798  1  2.0  5  1.725  7  2.0  11
4010401 0  11
4010501 0  11
4010601 84.0  1  90.0  5  45.0  6  -45.0  7  -90.0  11
4010701 0.728  1  2.0  5  1.685  6  -1.685  7  -2.0  11
*! 4010801 0.1e-03  0.091  1  0.01e-03  0.01968  11
4010801 0.1e-05  0.091  1  0.01e-07  0.01968  11
*! 4010901 0.44  0.60  1  0.01  0.01  5  0.22  0.22  6  0.01
0.01  10
4010901 0.01  0.01  1  0.0  0.0  10
4011001 00 11
*! 4011101 00100  1  00000  10
4011101 100000  10
4011201 103  1.55556e+07  5.63746e+02  0.00000e+00   0  0  1
4011202 103  1.55187e+07  5.63172e+02  0.00000e+00   0  0  2
4011203 103  1.54826e+07  5.62658e+02  0.00000e+00   0  0  3
4011204 103  1.54466e+07  5.62198e+02  0.00000e+00   0  0  4
4011205 103  1.54105e+07  5.61784e+02  0.00000e+00   0  0  5
4011206 103  1.53771e+07  5.61454e+02  0.00000e+00   0  0  6
4011207 103  1.53587e+07  5.61159e+02  0.00000e+00   0  0  7
4011208 103  1.53523e+07  5.60864e+02  0.00000e+00   0  0  8
4011209 103  1.53457e+07  5.60605e+02  0.00000e+00   0  0  9
4011210 103  1.53391e+07  5.60379e+02  0.00000e+00   0  0 10
4011211 103  1.53325e+07  5.60180e+02  0.00000e+00   0  0 11
4011300 0
4011301  6.73340e+00  6.73340e+00  0.00000e+00   1
4011302  6.72420e+00  6.72420e+00  0.00000e+00   2
4011303  6.71600e+00  6.71600e+00  0.00000e+00   3
4011304  6.70880e+00  6.70880e+00  0.00000e+00   4
4011305  6.70230e+00  6.70230e+00  0.00000e+00   5
4011306  6.69730e+00  6.69730e+00  0.00000e+00   6
4011307  6.69270e+00  6.69270e+00  0.00000e+00   7
4011308  6.68790e+00  6.68790e+00  0.00000e+00   8
4011309  6.68370e+00  6.68370e+00  0.00000e+00   9
4011310  5.86580e+00  5.86580e+00  0.00000e+00  10
4011401  .01968  0.0  1.0  1.0   10
*
* prim. sistem: sg izstopni prekat
4130000  o-ch branch
4130001  1  0
*! 4130101  0.0  0.798  35.061e-03  0.0  -85.0  -0.728  0.1e-03
0.091  00
4130101  0.0  0.798  35.061e-03  0.0  -85.0  -0.728  0.1e-04
0.091  00
4130200 103  1.55427e+07  5.60188e+02
*! 4131101  401010000  413000000  0.010342  0.60  0.44  130100
4131101  401010000  413000000  0.0103423  0.3  0.2  130000
4131201  6.67690e+00  6.96280e+00  0.00000e+00
*
* prim. sistem: sg izstop
8610000 sg-cl snqljun
*! 8610101 413010000  852000000  1.0936e-02  0.46  0.57  00100
8610101 413010000  852000000  1.0936e-02  0.01  0.02  130100
8610201   0  6.31440e+00  6.53290e+00  0.00000e+00
*
```

```
*
*****************************************************************
*********
*
* sek. sistem: dvizni kanal
4030000 riser pipe
4030001 6
4030101 0.0  6
4030201 0.01291  1  0.0214    4  0.048695  5
4030301 2.0      4  2.9605    5  0.8295    6
* povecanje mase sekundarnega hladila
*++ 4030401 0.11513  4  0.17171   5  0.04041   6
4030401 0.12513  4  0.18171   5  0.04041   6
4030501 0  6
4030601 90.0  6
4030701 2.0      4  2.9605    5  0.8295    6
4030801 0.1e-03  0.03503  5   0.1e-03  0.249  6
4030901 5.46  5.46  1  3.32  3.32  4  0.1  0.1  5
4031001 00  6
4031101 100100  4  100000  5
4031201 100  6.88635e+06  1.24544e+06  2.58278e+06  6.52234e-02
0.00000e+00   1
4031202 100  6.87346e+06  1.25147e+06  2.58289e+06  1.89380e-01
0.00000e+00   2
4031203 100  6.86224e+06  1.25111e+06  2.58298e+06  2.99390e-01
0.00000e+00   3
4031204 100  6.85241e+06  1.25062e+06  2.58305e+06  3.94690e-01
0.00000e+00   4
4031205 100  6.84126e+06  1.25006e+06  2.58314e+06  4.19940e-01
0.00000e+00   5
4031206 100  6.83290e+06  1.24938e+06  2.58318e+06  4.01720e-01
0.00000e+00   6
4031300 0
4031301  4.72633e-02  2.73670e-01  0.00000e+00   1
4031302  5.13252e-02  3.89160e-01  0.00000e+00   2
4031303  5.53480e-02  4.40620e-01  0.00000e+00   3
4031304  6.06002e-02  4.89430e-01  0.00000e+00   4
4031305  7.43054e-02  7.34650e-01  0.00000e+00   5
4031401  0.027   0.0   1.0   1.0  5
*          ++
*
* sek. sistem: separator pare
4070000 separ  separatr
4070001 3  0
4070101 0.0  1.9430  0.09467  0  90.0  1.9430  0.1e-04  0.249
00
4070200 100  6.82489e+06  1.24924e+06  2.58329e+06  1.46050e-01
4071101 407010000  410000000   4.8695e-02  0.82  0.14  01000
0.0
4072101 407000000  408000000  44.9150e-02  0.26  0.23  01000
0.0
4073101 403010000  407000000   4.8695e-02  0.0  0.0  01000
4071201 -9.28200e-02  3.06330e-01  0.00000e+00
4072201  4.68582e-03 -1.70166e-02  0.00000e+00
4073201  7.22507e-02  7.61480e-01  0.00000e+00
*
* sek. sistem: zgornji parni prostor
4100000 stmdome pipe
4100001 2
4100101 0.0  2
4100201 0.0  1
4100301 1.0800   1  0.4000    2
4100401 0.54287  1  0.134040  2
4100501  0.0  2
4100601 90.0  2
4100701 1.0800   1  0.4000    2
4100801 0.1e-03  0.8000  1  0.1e-03  0.41905  2
4100901 0.0  0.0  1
4101001 00  2
4101101 100000 1
4101201 102  6.81865e+06  1.00000e+00  0.00000e+00   0  0  1
4101202 102  6.81840e+06  1.00000e+00  0.00000e+00   0  0  2
4101300 0
4101301 -9.21311e-03  4.43731e-02  0.00000e+00   1
*
* sek. sistem: spoj uparjalnika in parovoda
4110000 sg-sl sngljun
4110101 410010000  420000000   0.0011401  0.222  1.0  130100
4110201   0  6.85760e+00  6.87050e+00  0.00000e+00
*
* sek. sistem: povratni kanal (zgornji obrocasti del)
4190000 udownann branch
4190001 1  0
4190101 0.0  1.9430  0.3078  0  90.0  1.9430  0.1e-03  0.1930
00
4190200 102  6.82494e+06  8.10100e-03
*4191101 410000000  419010000  0.44915  0.0  0.0  00100
4191101 410000000  419010000  0.0  0.5  0.5  130100
4191110 0.1930  0.0  1.0  1.0
4191201  3.04500e-01  3.67423e-04  0.00000e+00
*
* sek. sistem: povratni kanal (srednji obrocasti del)
4080000 mdownann branch
4080001 2  0
4080101 0.0  0.8275  0.081723  0  -90.0  -0.8275  0.1e-03
0.176  00
4080200 102  6.83416e+06  0.00000e+00
4081101 419000000  408000000  0.0  0.09  0.15  130000
*4082101 408010000  409000000  0.030415  0.0  0.0  00100
4082101 408010000  409000000  0.0  0.43  0.60  130100
4081110 0.1930  0.0  1.0  1.0
4082110 0.1760  0.0  1.0  1.0
4081201  1.76401e-04 -3.00110e-01  0.00000e+00
4082201  1.16890e-01  1.38490e-01  0.00000e+00
*
* sek. sistem: povratni kanal (spodnji cevni del)
4090000 pipedown pipe
4090001 5
4090101 0.0       5
4090201 0.0  1  0.005836  4
4090301 2.9625  1  2.0  5
4090401 0.06909  1  0.01167  4  0.01456  5
4090501   0     5
4090601 -90.0   5
4090701 -2.9625  1  -2.0  5
4090801 0.1e-03  0.05583  1  0.1e-03  0.0431  5
4090901 0.47  0.57  1  0.05  0.05  4
4091001 00  5
4091101 100100  1  100000  4
4091201 103  6.84846e+06  5.42776e+02  0.00000e+00   0  0  1
4091202 103  6.86700e+06  5.42788e+02  0.00000e+00   0  0  2
4091203 103  6.88200e+06  5.42759e+02  0.00000e+00   0  0  3
4091204 103  6.89700e+06  5.42811e+02  0.00000e+00   0  0  4
4091205 103  6.91205e+06  5.42849e+02  0.00000e+00   0  0  5
4091300 0
4091301  4.67180e-01  4.67180e-01  0.00000e+00   1
4091302  4.67090e-01  4.67090e-01  0.00000e+00   2
4091303  4.67080e-01  4.67080e-01  0.00000e+00   3
4091304  4.67080e-01  4.67080e-01  0.00000e+00   4
4091410  0.0431  0.0  1.0  1.0  4
*
*
* sek. sistem: spoj povratnega in dviznega kanala
* ni "abrupt area change" modela - regulacija recirkulacije
4350000  drs valve
4350101  409010000  403000000  0.025761  0.0  0.0  100000
4350201   0  1.05820e-01  1.44390e-01  0.00000e+00
4350300  srvvlv
4350301  424
4350401  0.01      0.01       0.01  * zaprto
4350402  1.0   1000.0    1000.0   * odprto
*
* ccci sg2 recirkulacija:  4x :  4 * 0.525 kg/s = 2.100 kg/s
20542400  reg435  sum  1.0  0.02847  0  3  0.01  1.0
20542401  0.0002100  -0.0001  mflowj  435000000  1.0  cntrlvar
424
*20542400  reg435  constant  1.0
*
*
*****************************************************************
*********
* hhss                    toplotna telesa sg 2
*
*****************************************************************
*********
*
* u cevi
14013000  10  4  2  1  0.00984
14013100  0  1
14013101  3  0.01111
14013201  3  3
14013301  0.0  3
14013401  570.330  1  566.810  2  563.420  3  560.15  4
* prim. -->
14013501  401020000   0   1   1   68.0    1
14013502  401030000   0   1   1   68.0    2
14013503  401040000   0   1   1   68.0    3
14013504  401050000   0   1   1   68.0    4
14013505  401060000   0   1   1   58.65   5
14013506  401070000   0   1   1   58.65   6
14013507  401080000   0   1   1   68.0    7
14013508  401090000   0   1   1   68.0    8
14013509  401100000   0   1   1   68.0    9
14013510  401110000   0   1   1   68.0   10
* --> sek.
14013601  403010000   0   1   1   68.0    1
14013602  403020000   0   1   1   68.0    2
14013603  403030000   0   1   1   68.0    3
14013604  403040000   0   1   1   68.0    4
14013605  403050000   0   1   1   58.65   5
14013606  403050000   0   1   1   58.65   6
14013607  403040000   0   1   1   68.0    7
14013608  403030000   0   1   1   68.0    8
14013609  403020000   0   1   1   68.0    9
14013610  403010000   0   1   1   68.0   10
*
14013701  0  0     0     0     10
14013801  0 10. 10. 0. 0.   0. 0.   1. 10
14013901  0 10. 10. 0. 0.   0. 0.   1. 10
*
* dividing plate in channel head
14011000  1  4  1  1  0.0
14011100  0  1
14011101  3  0.012
14011201  1  3
14011301  0.0  3
14011401  597.0  1   588.0  2   570.0  3   561.0  4
14011501  401010000  0  1  0  0.26643  1
```

```
14011601  413010000  0  1  0  0.26643  1
14011701  0  0     0  0  1
14011801  0 10. 10. 0. 0.  0. 0.  1. 1
14011901  0 10. 10. 0. 0.  0. 0.  1. 1
*
* cnannel head : zunanja stena --> plosca
14012000  2  4  1  1  0.0
14012100  0  1
14012101  3  0.0598
14012201  1  3
14012301  0.0  3
14012401  597.0  1   588.0  2   570.0  3   561.0  4
14012501  401010000  0  1  0  0.40167  1
14012502  413010000  0  1  0  0.40167  2
14012601  0  0  0  0  0.40167  1
14012602  0  0  0  0  0.40167  2
14012701  0  0     0  0  2
14012801  0 10. 10. 0. 0.  0. 0.  1. 2
14012901  0 10. 10. 0. 0.  0. 0.  1. 2
*
* tubesheet
14014000  2  4  1  1  0.0
14014100  0  1
14014101  3  0.1845
14014201  1  3
14014301  0.0  3
14014401  597.0  1   588.0  2   570.0  3   561.0  4
14014501  401010000  0  1  0  0.1139  1
14014502  413010000  0  1  0  0.1139  2
14014601  409050000  0  1  0  0.1139  1
14014602  403010000  0  1  0  0.1139  2
14014701  0  0     0  0  2
14014801  0 10. 10. 0. 0.  0. 0.  1. 2
14014901  0 10. 10. 0. 0.  0. 0.  1. 2
*
* riser (brez upper cylindrical shell) --> plosca: hhll
14031000  5  4  1  1  0.0
14031100  0  1
14031101  3  0.0159
14031201  1  3
14031301  1.0  3
14031401  597.0  1   588.0  2   570.0  3   561.0  4
14031501  403010000  0  1  0  2.895  1
14031502  403020000  0  1  0  2.895  2
14031503  403030000  0  1  0  2.895  3
14031504  403040000  0  1  0  2.895  4
14031505  403050000  0  1  0  4.286  5
14031601  0  0  0  0  2.895  1
14031602  0  0  0  0  2.895  2
14031603  0  0  0  0  2.895  3
14031604  0  0  0  0  2.895  4
14031605  0  0  0  0  4.286  5
14031701  10228  0.2   0  0  5
14031801  0 10. 10. 0. 0.  0. 0.  1. 5
14031901  0 10. 10. 0. 0.  0. 0.  1. 5
*
* upper-inner cylindrical shell --> plosca
14032000  2  4  1  1  0.0
14032100  0  1
14032101  3  0.006
14032201  1  3
14032301  0.0  3
14032401  597.0  1   588.0  2   570.0  3   561.0  4
14032501  408010000  0  1  0  0.6633  1
14032502  419010000  0  1  0  1.5537  2
14032601  403060000  0  1  0  0.6633  1
14032602  407010000  0  1  0  1.5537  2
14032701  0  0     0  0  2
14032801  0 10. 10. 0. 0.  0. 0.  1. 2
14032901  0 10. 10. 0. 0.  0. 0.  1. 2
*
* upper sleve and upper head ---> plosce 14101...14104
14101000  1  4  1  1  0.0
14101100  0  1
14101101  3  0.0210
14101201  1  3
14101301  0.0  3
14101401  597.0  1   588.0  2   570.0  3   561.0  4
14101501  0  0  0  0  1.005  1
14101601  4100206^0  0  1  0  1.005  1
14101701  0  0     0  0  1
14101801  0 10. 10. 0. 0.  0. 0.  1. 1
14101901  0 10. 10. 0. 0.  0. 0.  1. 1
*
14102000  1  4  1  1  0.0
14102100  0  1
14102101  3  0.0258
14102201  1  3
14102301  0.0  3
14102401  597.0  1   588.0  2   570.0  3   561.0  4
14102501  0  0  0  0  3.3870  1
14102601  410010000  0  1  0  3.3870  1
14102701  0  0     0  0  1
14102801  0 10. 10. 0. 0.  0. 0.  1. 1
14102901  0 10. 10. 0. 0.  0. 0.  1. 1
*
14103000  1  4  1  1  0.0
14103100  0  1
14103101  3  0.0947
14103201  1  3
14103301  0.0  3
14103401  597.0  1   588.0  2   570.0  3   561.0  4
14103501  0  0  0  0  0.4463  1
14103601  419010000  0  1  0  0.4463  1
14103701  0  0     0  0  1
14103801  0 10. 10. 0. 0.  0. 0.  1. 1
14103901  0 10. 10. 0. 0.  0. 0.  1. 1
*
14104000  1  4  1  1  0.0
14104100  0  1
14104101  3  0.0245
14104201  1  3
14104301  0.0  3
14104401  597.0  1   588.0  2   570.0  3   561.0  4
14104501  0  0  0  0  3.2448  1
14104601  408010000  0  1  0  3.2448  1
14104701  0  0     0  0  1
14104801  0 10. 10. 0. 0.  0. 0.  1. 1
14104901  0 10. 10. 0. 0.  0. 0.  1. 1
*
* downcomer --> plosce 4091-01, 4092-01-02-03-04
14091000  1  4  1  1  0.0
14091100  0  1
14091101  3  0.00394
14091201  1  3
14091301  0.0  3
14091401  597.0  1   588.0  2   570.0  3   561.0  4
14091501  0  0  0  0  4.0116  1
14091601  409010000  0  1  0  4.0116  1
14091701  0  0     0  0  1
14091801  0 10. 10. 0. 0.  0. 0.  1. 1
14091901  0 10. 10. 0. 0.  0. 0.  1. 1
*
14092000  4  4  1  1  0.0
14092100  0  1
14092101  3  0.00276
14092201  1  3
14092301  0.0  3
14092401  597.0  1   588.0  2   570.0  3   561.0  4
14092501  0  0  0  0  1.2028  1
14092502  0  0  0  0  1.2028  2
14092503  0  0  0  0  1.2028  3
14092504  0  0  0  0  1.2028  4
14092601  409020000  0  1  0  1.2028  1
14092602  409030000  0  1  0  1.2028  2
14092603  409040000  0  1  0  1.2028  3
14092604  409050000  0  1  0  1.2028  4
14092701  0  0     0  0  4
14092801  0 10. 10. 0. 0.  0. 0.  1. 4
14092901  0 10. 10. 0. 0.  0. 0.  1. 4
*
*
*************************************************************
*********
* ssggccvv            sg 2 kontrolne spremenljivke
*
*************************************************************
*********
*
* cv 403: sg2: nivo v povratnem kanalu [m]
20540300  levdc  sum  1.0  13.45  1
20540301  0.0  2.0     voidf 409050000  2.0     voidf  409040000
20540302       2.0     voidf 409030000  2.0     voidf  409020000
20540303       2.9625 voidf 409010000  0.8275 voidf  408010000
20540304       1.9430 voidf 419010000
*
* cv 405: sg2: masa sekundarnega hladila [kg]
20540500  ssgmass  sum  1.0  790.0  1
*++ 20540501  0.0  0.11513  rho 403010000  0.11513  rho
403020000
*++ 20540502       0.11513  rho 403030000  0.11513  rho
403040000
*++ 20540503       0.17171  rho 403050000  0.04041  rho
403060000
20540501  0.0  0.12513  rho 403010000  0.12513  rho 403020000
20540502       0.12513  rho 403030000  0.12513  rho 403040000
20540503       0.18171  rho 403050000  0.04041  rho 403060000
20540504       0.09466  rho 407010000  0.54287  rho 410010000
20540505       0.13404  rho 410020000  0.30780  rho 419010000
20540506       0.08172  rho 408010000  0.06909  rho 409010000
20540507       0.01167  rho 409020000  0.01167  rho 409030000
20540508       0.01167  rho 409040000  0.01456  rho 409050000
*
*
*************************************************************
*********
* mmff                    main feedwater 2
*
*************************************************************
*********
*
* konstantni mfw tok
*
43^ ^000 mfw tmdpjun
   ,101 431000000  432000000  0.0266
4340200 1  505  * si
4340201 -1.0  0.52517   0.  0.
4340202  0.0  0.52517   0.  0.
```

```
4340203  6.0  0.0        0.  0.
*
* volumski mfw tok
*20540200   vmfw  div  1.0   0.0   1
*20540201   rhof  432010000  mflowj  432010000
*
* feedwater line
4320000 fwline branch
4320001 1  0
4320101 5.557e-04  10.0  0  0  60.0  7.0  0.01e-03  0.0266  00
4320200 103  6.86275e+06  4.90974e+02
*4321101 432010000 408000000  0.0006786  0.  0.  00100
4321101 432010000 408000000  0.0  1.0  0.  130100
4321201  1.11560e+00  1.11560e+00  0.00000e+00
*
* vir napajalne vode
4310000 fwsource tmdpvol
4310101 1.0  0.0  10.0  0  0  0  0.01e-03  0.0  00
4310200 103
4310201 0  70.0+5  491.0
*
*************************************************************
*********
*
* ccci "regulacija" sg2 nivoja
* ce konstantni mfw 434 reguliramo nivo v povratnem kanalu
*
4290000 v429 tmdpvol
4290101 1.0  0.0  10.0  0.0  0.0  0.0  0.2e-03  0.0  0
4290200 103
4290201 0  70.0+5  491.0
*
4300000 j430 tmdpjun
4300101 429000000  419010000  0.0
4300200 1  0  cntrlvar 403   * sg level
4300201  -1.0       0.0        0.0   0.0
4300202  13.35      1.5        0.0   0.0
4300203  13.45      0.0        0.0   0.0
4300204  13.55     -1.5        0.0   0.0
*
*4300000 j430 tmdpjun
*4300101 429000000  419010000  0.0
*4300200 1  0  cntrlvar 405   * sg mass
*4300201  -1.0       0.0        0.0   0.0
*4300202  790.0      1.5        0.0   0.0
*4300203  800.0      0.0        0.0   0.0
*4300204  810.0     -0.50       0.0   0.0
*
*
*************************************************************
*********
* ssll                        parovod 2
*
*************************************************************
*********
*
* steam line from porv+sv+msiv
4200000 stmline  snglvol
4200101 0.0  31.65  68.5e-03  0  -45.0  -18.670  0.01-3  0.0525
00
4200200 102  6.81255e+06  1.00000e+00
*
* hhss
* 14201000  1  4  2  1  0.0525
14201000  1  4  2  0  0.0525  * ff11
14201100  0  1
14201101  3  0.0603
14201201  1  3
14201301  0.0  3
14201401  570.330  1  566.810  2  563.420  3  560.15  4
14201501  420010000   0   1   1   31.65   1
14201601  0  0  0  1  31.65  1
14201701  0  0    0    0    1
14201801  0 10. 10. 0. 0.  0. 0.  1. 1
14201901  0 10. 10. 0. 0.  0. 0.  1. 1
*
*
*************************************************************
*********
* cccl    regulacija tcold 2 preko tlaka sekundarne strani
*
*************************************************************
*********
*
* delta tcold : bethsy referenca : 559.85 k
20540000  dtcold  sum  1.0  0.0  0
20540001  560.35  -1.0  tempf  855010000
* 20540001  559.35  -1.0  tempf  855010000  * !e
*
20544400  p444  sum  1.0  68.12e+05  0
20544401  0.0  1.0  p  444010000  300.  cntrlvar 400
*
4150000  venturi  sngljun
4150101  420010000  444000000  0.0  0.0  0.0  130000
4150201   0  6.87740e+00  6.87740e+00  0.00000e+00
*
4440000  turbine  tmdpvol
4440101  10.0  0.0  1000.0  0  0.0  0  0.2e-03  0  0
4440200  2  0  cntrlvar 444
4440201   -1.0       68.12e+05  1.0
4440202    1.0e+05    1.0e+05    1.0
4440203  100.0e+05  100.0e+05    1.0
*
*
*************************************************************
*********
* rrccss            cevovodi primarnega kroga 2
*
*************************************************************
*********
*
* * prim. sistem: hot leg do surge line
* 8030000 hleg  snglvol
* 8030101 0.010936  1.4441  0.0  0.0  0.0  0.0  0.1e-03  0.1180
00
* 8030200 103  1.55957e+07  5.63790e+02
*
8030000 hleg  pipe
8030001 5
8030101 0.010936 5
8030201 0.010936 4
8030301 0.28882  5
8030401 0.0  5
8030501 0.0  5
8030601 0.0  5
8030701 0.0  5
8030801 0.1e-03  0.1180  5
8030901 0.0  0.0  4
8031001 00    5
8031101 100000  4  *fvcahs:v=0
*                  should be input as not used
8031201 103  1.55942e+07  5.63761e+02  0.00000e+00   0  0  1
8031202 103  1.55935e+07  5.63762e+02  0.00000e+00   0  0  2
8031203 103  1.55928e+07  5.63762e+02  0.00000e+00   0  0  3
8031204 103  1.55921e+07  5.63762e+02  0.00000e+00   0  0  4
8031205 103  1.55914e+07  5.63762e+02  0.00000e+00   0  0  5
8031300 0
8031301  6.36760e+00  6.36760e+00  0.00000e+00   1
8031302  6.36760e+00  6.36760e+00  0.00000e+00   2
8031303  6.36760e+00  6.36760e+00  0.00000e+00   3
8031304  6.36760e+00  6.36760e+00  0.00000e+00   4
*
* prim. sistem: hot leg spoj pri sl
8130000 hl813 sngljun
*! 8130101 803010000  802000000  0.0  0.0  0.0  00000
8130101 803010000  802000000  0.0  0.265  0.265  130000
8130201   0  6.36770e+00  6.36770e+00  0.00000e+00
*
* * prim. sistem: hot leg od sl do sg
* 8020000 hleg  pipe
* 8020001 2
* 8020101 0.010936 2
* 8020201 0.010936 1
* 8020301 1.1891  1  1.8558  2
* 8020401 0.0  2
* 8020501 0.0  2
* 8020601 9.0  1  70.0  2
* 8020701 0.1800  1  1.7317  2
* 8020801 0.1e-03  0.1180  2
* *! 8020901 0.31  0.31  1
* 8020901 0.24  0.24  1
* 8021001 00    2
* 8021101 100000  1
* 8021201 103  1.55880e+07  5.63790e+02  0.00000e+00   0  0  1
* 8021202 103  1.55738e+07  5.63790e+02  0.00000e+00   0  0  2
* 8021300 0
* 8021301  6.29920e+00  6.29920e+00  0.00000e+00   1
*
8020000 hleg  pipe
8020001 10
8020101 0.010935 10
8020201 0.010936  9
8020301 0.23782   5  0.37116  10
8020401 0.0  10
8020501 0.0  10
8020601 9.0  5  70.0  10
8020701 0.036  5  0.34634  10   * ++
8020801 0.1e-03  0.1180    10
8020901 0.0267  0.0267  9
8021001 00    10
8021101 100000 5  100000  9    * v=0
8021201 103  1.55866e+07  5.63760e+02  0.00000e+00   0  0  1
8021202 103  1.55853e+07  5.63760e+02  0.00000e+00   0  0  2
8021203 103  1.55841e+07  5.63760e+02  0.00000e+00   0  0  3
8021204 103  1.55829e+07  5.63759e+02  0.00000e+00   0  0  4
8021205 103  1.55816e+07  5.63759e+02  0.00000e+00   0  0  5
8021206 103  1.55791e+07  5.63758e+02  0.00000e+00   0  0  6
8021207 103  1.55752e+07  5.63757e+02  0.00000e+00   0  0  7
8021208 103  1.55714e+07  5.63756e+02  0.00000e+00   0  0  8
8021209 103  1.55676e+07  5.63755e+02  0.00000e+00   0  0  9
8021210 103  1.55637e+07  5.63754e+02  0.00000e+00   0  0 10
8021300 0
8021301  6.36770e+00  6.36770e+00  0.00000e+00   1
8021302  6.36770e+00  6.36770e+00  0.00000e+00   2
8021303  6.36770e+00  6.36770e+00  0.00000e+00   3
8021304  6.36770e+00  6.36770e+00  0.00000e+00   4
8021305  6.36770e+00  6.36770e+00  0.00000e+00   5
8021306  6.36770e+00  6.64560e+00  0.00000e+00   6
```

```
8021307  6.36780e+00  6.64560e+00  0.00000e+00   7
8021308  6.36780e+00  6.64570e+00  0.00000e+00   8
8021309  6.36790e+00  6.64580e+00  0.00000e+00   9
*
************************************************************
*********
* sg
************************************************************
*********
*
* prim. sistem: intermediate leg down
* 8520000 ileg_a  pipe
* 8520001 2
* 8520101 0.010936  2
* 8520201 0.010936  1
* 8520301 2.5122  1  2.0697  2
* 8520401 0.0  2
* 8520501 0.0  2
* 8520601 -76.0  1  -72.0  2
* 8520701 -2.4337  1  -1.9670  2
* *! 8520801 0.1e-03  0.1180  2
* 8520801 0.1e-04  0.1180  2
* *! 8520901 0.11  0.11  1
* 8520901 0.1  0.1  1
* 8521001 00  2
* 8521101 100000  1
* 8521201 103  1.53406e+07  5.60210e+02  0.00000e+00   0  0  1
* 8521202 103  1.53516e+07  5.60220e+02  0.00000e+00   0  0  2
* 8521300 0
* 8521301  6.24650e+00  6.24650e+00  0.00000e+00   1
*
8520000 ileg_a  pipe
8520001 10
8520101 0.010936  10
8520201 0.010936  9
8520301 0.50244  5  0.41394  10
8520401 0.0  10
8520501 0.0  10
8520601 -76.0  5  -72.0  10
8520701 -0.48674  5  -0.39340  10   *++
*! 8520801 0.1e-03  0.1180  10
8520801 0.1e-04  0.1185  10
*! 8520901 0.11  0.11  9
8520901 0.011  0.011  9
8521001 00  10
8521101 100000  9
8521201 103  1.53271e+07  5.60182e+02  0.00000e+00   0  0  1
8521202 103  1.53297e+07  5.60183e+02  0.00000e+00   0  0  2
8521203 103  1.53323e+07  5.60185e+02  0.00000e+00   0  0  3
8521204 103  1.53349e+07  5.60186e+02  0.00000e+00   0  0  4
8521205 103  1.53375e+07  5.60187e+02  0.00000e+00   0  0  5
8521206 103  1.53398e+07  5.60188e+02  0.00000e+00   0  0  6
8521207 103  1.53418e+07  5.60189e+02  0.00000e+00   0  0  7
8521208 103  1.53439e+07  5.60189e+02  0.00000e+00   0  0  8
8521209 103  1.53459e+07  5.60190e+02  0.00000e+00   0  0  9
8521210 103  1.53480e+07  5.60191e+02  0.00000e+00   0  0 10
8521300 0
8521301  6.31450e+00  6.59410e+00  0.00000e+00   1
8521302  6.31450e+00  6.59400e+00  0.00000e+00   2
8521303  6.31450e+00  6.59400e+00  0.00000e+00   3
8521304  6.31440e+00  6.59400e+00  0.00000e+00   4
8521305  6.31440e+00  6.59390e+00  0.00000e+00   5
8521306  6.31440e+00  6.59390e+00  0.00000e+00   6
8521307  6.31440e+00  6.59390e+00  0.00000e+00   7
8521308  6.31440e+00  6.59380e+00  0.00000e+00   8
8521309  6.31440e+00  6.59380e+00  0.00000e+00   9
*
8630000 jun863 sngljun
*! 8630101 852010000  853000000  0.0  0.20  0.20  00000
8630101 852010000  853000000  0.0  0.0  0.0  130000
8630201   0  6.31439e+00  6.59380e+00  0.00000e+00
*
* * prim. sistem: intermediate leg
* 8530000  ileg_b  snglvol
* 8530101 0.010936  1.1027  0.0  0.0  9.0  0.180  0.1e-03
0.1180  00
* 8530200 103  1.53553e+07  5.60220e+02
*
8530000 ileg_b  pipe
8530001 5
8530101 0.010936 5
8530201 0.010936 4
8530301 0.22054  5
8530401 0.0  5
8530501 0.0  5
8530601 9.0  5
8530701 0.036  5
8530801 0.1e-03  0.1180  5
8530901 0.0  0.0  4
8531001 00    5
8531101 100000  4  *fvcahs:v=0
*                    should be input as not used
8531201 103  1.53487e+07  5.60192e+02  0.00000e+00   0  0  1
8531202 103  1.53479e+07  5.60191e+02  0.00000e+00   0  0  2
8531203 103  1.53471e+07  5.60191e+02  0.00000e+00   0  0  3
8531204 103  1.53463e+07  5.60191e+02  0.00000e+00   0  0  4
8531205 103  1.53455e+07  5.60191e+02  0.00000e+00   0  0  5
8531300 0
8531301  6.31430e+00  6.31430e+00  0.00000e+00   1
8531302  6.31440e+00  6.31440e+00  0.00000e+00   2
8531303  6.31440e+00  6.31440e+00  0.00000e+00   3
8531304  6.31440e+00  6.31440e+00  0.00000e+00   4
*
8640000 jun864 sngljun
*! 8640101 853010000  854000000  0.0  0.20  0.20  00000
8640101 853010000  854000000  0.0  0.0  0.0  130000
8640201   0  6.31440e+00  6.31440e+00  0.00000e+00
*
* * prim. sistem: intermediate leg up
* 8540000  ileg_c  snglvol
* *8540101 0.010936  1.7870  0.0  0.0  90.0  1.7870  0.1e-03
0.1180  00
* 8540101 0.010936  1.7871  0.0  0.0  90.0  1.7871  0.1e-03
0.1180  00
* *++ podaljsek 0.1 mm zaradi sklenitve rcs elevacij v rx
(napaka baze pod.)
* 8540200 103  1.53446e+07  5.60220e+02
*
8540000 ileg_c  pipe
8540001 5
8540101 0.010936 5
8540201 0.010936 4
8540301 0.35742  5
8540401 0.0  5
8540501 0.0  5
8540601 90.0  5
8540701 0.35742  5
8540801 0.1e-03  0.1180  5
8540901 0.0  0.0  4
8541001 00    5
8541101 100000  4  *fvcahs:v=0
*                    should be input as not used
8541201 103  1.53434e+07  5.60191e+02  0.00000e+00   0  0  1
8541202 103  1.53399e+07  5.60190e+02  0.00000e+00   0  0  2
8541203 103  1.53364e+07  5.60189e+02  0.00000e+00   0  0  3
8541204 103  1.53329e+07  5.60188e+02  0.00000e+00   0  0  4
8541205 103  1.53294e+07  5.60186e+02  0.00000e+00   0  0  5
8541300 0
8541301  6.31440e+00  6.59380e+00  0.00000e+00   1
8541302  6.31440e+00  6.59390e+00  0.00000e+00   2
8541303  6.31450e+00  6.59400e+00  0.00000e+00   3
8541304  6.31450e+00  6.59400e+00  0.00000e+00   4
*
*
************************************************************
*********
*                          rcp-2
RCP+ *
************************************************************
*********
*
8000000 in2 branch
8000001 1  0
8000101 0.010936  0.232  0.0  0.0  90.0  0.232  0.01e-04  0.118
00
8000200 100  1.56151e+07  1.24842e+06  2.44514e+06  0.00000e+00
8001101 854010000 800000000  0.0  0.0  0.0  130000
8001201 6.31570e+00  6.59530e+00  0.00000e+00
*
* pump loop 2
7020000  pump2 pump
7020101  0.0  0.097  14.0628e-03  0.0  60.0  0.084  00
7020108  800010000  0.  0.47  0.49  100000  *++ upor ustavljene
crpalke ?
7020109  801000000  0.  0.49  0.47  100000
7020200   0  1.56151e+07  1.24842e+06  2.44514e+06  0.00000e+00
7020201   0  6.31570e+00  6.59530e+00  0.00000e+00
7020202   0  1.06000e+00  1.06000e+00  0.00000e+00
* pump index and option card
7020301  -2  0  -2  -1  0  505  ?   * trip 505: si -> pump 2
stop
* pump description card
*! 7020302  311.0  1.0  0.063056  78.0  0.0
7020302  311.0  1.0  0.067939  78.0  0.0
* 7020302  311.0  1.0  0.058797 78.0  0.0   * 18
7020303  5.0  751.0  0.0  0.0  74.39  71.39  0.0  *++ rated
density
* mh  two phase pump head multiplier tables
7023000  0  0.0  0.0,  0.2  0.0,  0.4  1.0,  0.9  1.0,  1.0
0.0
* mt  two phase pump torque multiplier tables
7023100  0  0.0  0.0,  0.2  0.0,  0.4  1.0,  0.9  1.0,  1.0
0.0
*
* pump velocity table (rad/s)
7026100  505
7026101  300.0  311.0
7026102  305.0  201.0   310.0  141.1
7026103  320.0  113.1   330.0   88.0
7026104  340.0   75.4   350.0   62.8
7026105  370.0   47.1   400.0   37.7
7026106  500.0   22.0   700.0   15.7
7026107  916.0   10.5   917.0    0.0
*
*
8010000 out2 branch
8010001 1  0
```

```
8010101 0.0  0.084  5.460e-03  0.0  -9v.0  -0.084  0.61e-04
0.0  00
8010200 100  1.56151e+07  1.24842e+06  2.44514e+06  0.00000e+00
8011101 801010000 855000000  0.0  0.0  0.0  130000
8011201 6.31570e+00  6.59530e+00  0.00000e+00
*
*
*************************************************************
*********
*
* hhll-hhss rcp2
17020000  1  3  1  1  0.0
17020100  0  1
17020101  2  0.1
17020201  1  2
17020301  1.0  2
17020401  560.0  3
17020501  7020*0000  0  1  1  1.0  1
17020601  0           0  0  1  1.0  1
17020701  10701  1.0  0.0  0.0  1
17020801  0  10. 10. 0. 0. 0. 0. 1. 1
*
*************************************************************
*********
*
* * prim. sistem: cold leg a
* 8550000 cleg_a branch
* 8550001 1  0
* *! 8550101 0.010936  1.8656  0.0  0.0  0.0  0.0  0.1e-03
0.1180  00
* 8550101 0.010936  1.8656  0.0  0.0  0.0  0.0  0.1e-04  0.1180
00
* 8550200 103  1.58910e+07  5.60350e+02
* *! 8551101 855010000  856000000  0.0  0.07  0.07  00000
* 8551101 855010000 856000000  0.0  0.002  0.002  130000
* 8551201  6.24130e+00  6.24130e+00  0.00000e+00
*
8550000 cleg_a  pipe
8550001 5
8550101 0.010936 5
8550201 0.010936 4
* 8550301 0.37312  5
8550301 0.24875  5  * RCP+
8550401 0.0  5
8550501 0.0  5
8550601 0.0  5
8550701 0.0  5
8550801 0.1e-03  0.1180  5
8550901 0.0  0.0  4
8551001 00    5
8551101 100000  4  *fvcahs:v+0
*                  should be input as not used
8551201 103  1.58753e+07  5.60350e+02  0.00000e+00   0  0  1
8551202 103  1.58745e+07  5.60349e+02  0.00000e+00   0  0  2
8551203 103  1.58736e+07  5.60349e+02  0.00000e+00   0  0  3
8551204 103  1.58727e+07  5.60349e+02  0.00000e+00   0  0  4
8551205 103  1.58718e+07  5.60349e+02  0.00000e+00   0  0  5
8551300 0
8551301  6.30980e+00  6.30980e+00  0.00000e+00   1
8551302  6.30980e+00  6.30980e+00  0.00000e+00   2
8551303  6.30980e+00  6.30980e+00  0.00000e+00   3
8551304  6.30980e+00  6.30980e+00  0.00000e+00   4
*
8580000 jun858 sngljun
8580101 855010000  856000000  0.0  0.002  0.002  130000
8580201   0  6.30980e+00  6.30980e+00  0.00000e+00
```

```
*
* * prim. sistem: cold leg b
* 8560000 cleg_b  snglvol
* *! 8560101 0.010936  1.8656  0.0  0.0  0.0  0.0  0.1e-03
0.1180  00
* 8560101 0.010936  1.8656  0.0  0.0  0.0  0.0  0.1e-04  0.1180
00
* 8560200 103  1.58875e+07  5.60350e+02
*
8560000 cleg_b  pipe
8560001 5
8560101 0.010936 5
8560201 0.010936 4
8560301 0.37312  5
8560401 0.0  5
8560501 0.0  5
8560601 0.0  5
8560701 0.0  5
8560801 0.1e-03  0.1180  5
8560901 0.0  0.0  4
8561001 00    5
8561101 100000  4  *fvcahs:v+0
*                  should be input as not used
8561201 103  1.58708e+07  5.60349e+02  0.00000e+00   0  0  1
8561202 103  1.58700e+07  5.60349e+02  0.00000e+00   0  0  2
8561203 103  1.58691e+07  5.60349e+02  0.00000e+00   0  0  3
8561204 103  1.58682e+07  5.60349e+02  0.00000e+00   0  0  4
8561205 103  1.5867Je+07  5.60349e+02  0.00000e+00   0  0  5
8561300 0
8561301  6.30990e+00  6.30990e+00  0.00000e+00   1
8561302  6.30990e+00  6.30990e+00  0.00000e+00   2
8561303  6.30990e+00  6.30990e+00  0.00000e+00   3
8561304  6.30990e+00  6.30990e+00  0.00000e+00   4
*
*************************************************************
*********
* hhss            toplotna telesa - primarni cevovod 2
*
*************************************************************
*********
*
* vsa toplotna telesa primarnih cevovodov so poenostavljena v
plosce
*
* * hot leg - cev s prirobnicami: hhll
* 18021000  3  4  1  1  0.0
* 18021100  0  1
* 18021101  3  0.0286
* 18021201  1  3
* 18021301  1.0  3
* 18021401  597.0  1   588.0  2   570.0  3   561.0  4
* 18021501  803010000  0  1  0  0.5353  1
* 18021502  802010000  0  1  0  0.4408  2
* 18021503  802020000  0  1  0  0.6879  3
* 18021601  0  0  0  0  0.5353  1
* 18021602  0  0  0  0  0.4408  2
* 18021603  0  0  0  0  0.6879  3
* 18021701  10229  0.333    0  0  3
* 18021801  0 10. 10. 0. 0.  0. 0.  1. 3
* 18021901  0 10. 10. 0. 0.  0. 0.  1. 3
*
* hot leg - cev s prirobnicami: hhll
18021000  15  4  1  1  0.0
18021100  0  1
18021101  3  0.0286
18021201  1  3
```



```
18021301  1.0  3
18021401  597.0  1   588.0  2   570.0  3   561.0  4
18021501  803010000  10000  1  0  0.1070  5
18021502  802010000  10000  1  0  0.0881  10
18021503  802060000  10000  1  0  0.1376  15
18021601  0  0  0  0  0.1070  5
18021602  0  0  0  0  0.0881  10
18021603  0  0  0  0  0.1376  15
18021701  10229  0.0667  0  0  15
18021801  0 10. 10. 0. 0.  0. 0.  1. 15
18021901  0 10. 10. 0. 0.  0. 0.  1. 15
*
* * intermediate leg - cev s prirobnicami: hhll
* 18521000  4  4  1  1  0.0
* 18521100  0  1
* 18521101  3  0.0226
* 18521201  1  3
* 18521301  1.0  3
* 18521401  597.0  1   588.0  2   570.0  3   561.0  4
* 18521501  852010000  0  1  0  0.9313  1
* 18521502  852020000  0  1  0  0.7673  2
* 18521503  853010000  0  1  0  0.4088  3
* 18521504  854010000  0  1  0  0.6625  4
* 18521601  0  0  0  0  0.9313  1
* 18521602  0  0  0  0  0.7673  2
* 18521603  0  0  0  0  0.4088  3
* 18521604  0  0  0  0  0.6625  4
* 18521701  10227  0.166  0  0  4
* 18521801  0 10. 10. 0. 0.  0. 0.  1. 4
* 18521901  0 10. 10. 0. 0.  0. 0.  1. 4
*
* intermediate leg - cev s prirobnicami: hhll
18521000  20  4  1  1  0.0
18521100  0  1
18521101  3  0.0226
18521201  1  3
18521301  1.0  3
18521401  597.0  1   588.0  2   570.0  3   561.0  4
18521501  852010000  10000  1  0  0.1863  5
18521502  852060000  10000  1  0  0.1535  10
18521503  853010000  10000  1  0  0.0818  15
18521504  854010000  10000  1  0  0.1325  20
18521601  0  0  0  0  0.1863  5
18521602  0  0  0  0  0.1535  10
18521603  0  0  0  0  0.0818  15
18521604  0  0  0  0  0.1325  20
18521701  10227  0.0332  0  0  20
18521801  0 10. 10. 0. 0.  0. 0.  1. 20
18521901  0 10. 10. 0. 0.  0. 0.  1. 20
*
* * cold leg - cev s prirobnicami: hhll
* 18551000  2  4  1  1  0.0
* 18551100  0  1
* 18551101  3  0.0279
* 18551201  1  3
* 18551301  1.0  3
* 18551401  597.0  1   588.0  2   570.0  3   561.0  4
* 18551501  855010000  0  1  0  0.6915  1
* 18551502  856010000  0  1  0  0.6915  2
* 18551601  0  0  0  0  0.6915  1
* 18551602  0  0  0  0  0.6915  2
* 18551701  10227  0.166  0  0  2
* 18551801  0 10. 10. 0. 0.  0. 0.  1. 2
* 18551901  0 10. 10. 0. 0.  0. 0.  1. 2
*
* cold leg - cev s prirobnicami: hhll
```

```
18551000  10  4  1  1  0.0
18551100  0  1
18551101  3  0.0279
18551201  1  3
18551301  1.0  3
18551401  597.0  1   588.0  2   570.0  3   561.0  4
18551501  855010000  10000  1  0  0.1383  5
18551502  856010000  10000  1  0  0.1383  10
18551601  0  0  0  0  0.1383  5
18551602  0  0  0  0  0.1383  10
18551701  10227  0.0332  0  0  10
18551801  0 10. 10. 0. 0.  0. 0.  1. 10
18551901  0 10. 10. 0. 0.  0. 0.  1. 10
*
*
************************************************************
*********
* ddhh2 :        dh korekcija nekaterih rcs2 tlacnih zaznaval
*
************************************************************
*********
*
* cv 820 : dh korigirano tlacno zaznavalo 802-10 [pa]
20582000  pk80202  sum  9.8067  0.0  1
20582001  0.0  0.10197 p 802100000  -0.15 rho 802100000  * R+
*
* cv 821 : dh korigirano tlacno zaznavalo 401-06 [pa]
20582100  pk40106  sum  9.8067  0.0  1
20582101  0.0  0.10197 p 401060000  -0.8425 rho 401060000
*
* cv 822 : dh korigirano tlacno zaznavalo 852-01 [pa]
20582200  pk85201  sum  9.8067  0.0  1
20582201  0.0  0.10197 p 852010000  -0.15 rho 852010000  * R+
*
* cv 823 : dh korigirano tlacno zaznavalo 852-10 [pa]
20582300  pk85202  sum  9.8067  0.0  1
20582301  0.0  0.10197 p 852100000  -0.15 rho 852100000  * R+
*
* cv 824 : dh korigirano tlacno zaznavalo 854-05 [pa]
20582400  pk85401  sum  9.8067  0.0  1
20582401  0.0  0.10197 p 854050000  -0.15 rho 854050000  * R+
*
*
************************************************************
**********
** ccvvii        dpmeasured - gravity term - zanka 2
*
************************************************************
**********
**
** ta blok cv je uporabljan med rcs2 dp inicializacijo
** upostevane so vse dh korekcije tlacnih zaznaval
**
**
** cv 830 : dp21h [bar]
*20583000  dp21h  sum  1.0e-05  -0.0763  0
*20583001  0.0  1.0 p 802010000  -1.0 p 803010000  * dh=0.0m
**
**
** cv 831 : dp21v [bar]
*20583100  dp21v  sum  1.0e-05  -0.0792  0
**20583101  0.0  1.0 p 802020000  -1.0 p 802010000  1.0
cntrlvar 832
*20583101  0.0  1.0 cntrlvar 820  -1.0 p 802010000  1.0
cntrlvar 832
**
** cv 832 : dp21v gravity term [pa]
*20583200  dpgt  sum  9.8067  0.0  1
*20583201  0.0  1.7317  rho  802010000
**
**
** cv 833 : dp51 [bar]
*20583300  dp51  sum  1.0e-05  -0.0562  0
**20583301  0.0  1.0 p 401010000  -1.0 p 802020000  1.0
cntrlvar 834
*20583301  0.0  1.0 p 401010000  -1.0 cntrlvar 820  1.0
cntrlvar 834
**
** cv 834 : dp51 gravity term [pa]
*20583400  dpgt  sum  9.8067  0.0  1
*20583401  0.0  0.364  rho  802020000
**
**
** cv 835 : hot leg dp [bar]
*20583500  hldp  sum  1.0e-05  -0.2137  0
*20583501  0.0  1.0 p 401010000  -1.0 p 803010000  1.0 cntrlvar
836
**
** cv 836 : hldp gravity term [pa]
*20583600  dpgt  sum  9.8067  0.0  1
*20583601  0.0  2.0957  rho  802010000
**
**
** cv 837 : dp52x [bar]
*20583700  dp52x  sum  1.0e-05  -1.1424  0
**20583701  0.0  1.0 p 401060000  -1.0 p 401010000  1.0
cntrlvar 838
*20583701  0.0  1.0 cntrlvar 821  -1.0 p 401010000  1.0
cntrlvar 838
**
** cv 838 : dp52x gravity term [pa]
*20583800  dpgt  sum  9.8067  0.0  1
*20583801  0.0  9.2065  rho  401020000
**
**
** cv 839 : dp53x [bar]
*20583900  dp53x  sum  1.0e-05  -0.9681  0
**20583901  0.0  1.0 p 413010000  -1.0 p 401060000  1.0
cntrlvar 840
*20583901  0.0  1.0 p 413010000  -1.0 cntrlvar 821  1.0
cntrlvar 840
**
** cv 840 : dp53x gravity term [pa]
*20584000  dpgt  sum  9.8067  0.0  1
*20584001  0.0  -9.2065  rho  401080000
**
**
** cv 841 : steam generator dp [bar]
*20584100  sgdp  sum  1.0e-05  -2.1105  0
*20584101  0.0  1.0 p 413010000  -1.0 p 401010000  * dh=0.0m
**
**
** cv 842 : dp54 [bar]
*20584200  dp54  sum  1.0e-05  -0.1801  0
**20584201  0.0  1.0 p 852010000  -1.0 p 413010000  1.0
cntrlvar 843
*20584201  0.0  1.0 cntrlvar 822  -1.0 p 413010000  1.0
cntrlvar 843
**
** cv 843 : dp54 gravity term [pa]
*20584300  dpgt  sum  9.8067  0.0  1
*20584301  0.0  -0.364  rho  852010000
**
**
** cv 844 : dp22vg [bar]
*20584400  dp22vg  sum  1.0e-05  -0.0576  0
**20584401  0.0  1.0 p 852020000  -1.0 p 852010000  1.0
cntrlvar 845
*20584401  0.0  1.0 cntrlvar 823  -1.0 cntrlvar 822  1.0
cntrlvar 845
**
** cv 845 : dp22vg gravity term [pa]
*20584500  dpgt  sum  9.8067  0.0  1
*20584501  0.0  -4.4007  rho  852020000
**
**
** cv 846 : dp22vp [bar]
*20584600  dp22vp  sum  1.0e-05  -0.0634  0
**20584601  0.0  1.0 p 854010000  -1.0 p 852020000  1.0
cntrlvar 847
*20584601  0.0  1.0 cntrlvar 824  -1.0 cntrlvar 823  1.0
cntrlvar 847
**
** cv 847 : dp22vp gravity term [pa]
*20584700  dpgt  sum  9.8067  0.0  1
*20584701  0.0  1.967  rho  853010000
**
**
** cv 848 : intermediate leg dp [bar]
*20584800  ildp  sum  1.0e-05  -0.3011  0
**20584801  0.0  1.0 p 854010000  -1.0 p 413010000  1.0
cntrlvar 849
*20584801  0.0  1.0 cntrlvar 824  -1.0 p 413010000  1.0
cntrlvar 849
**
** cv 849 : ildp gravity term [pa]
*20584900  dpgt  sum  9.8067  0.0  1
*20584901  0.0  -2.797  rho  852020000
**
**
** cv 850 : dp22p [bar]
*20585000  dp22p  sum  1.0e-05  0.0  1
**20585001  0.0  1.0 p 855010000  -1.0 p 854010000  1.0
cntrlvar 851
*20585001  0.0  1.0 p 855010000  -1.0 cntrlvar 824  1.0
cntrlvar 851
**
** cv 851 : dp22p gravity term [pa]
*20585100  dpgt  sum  9.8067  0.0  1
*20585101  0.0  0.232  rho  854010000
**
**
** cv 852 : dp23h [bar]
*20585200  dp23h  sum  1.0e-05  -0.0303  0
*20585201  0.0  1.0 p 856010000  -1.0 p 855010000  * dh=0.0m
**
**
************************************************************
*********
*
*
* sggg                  uparjalnik 3
*
*
*
************************************************************
*********
*
```

```
*  kkk : inicializacija uparjalnika
*
* :masa sekundarnega hladila je vstrsnka (.= 790 kg - spodnja
meja)
*   pri recirkulacijskem razmerju 4x
*
* :kasneje je bila masa ob dvigu nivoja povecana na 800 kg,
downcomer
*   je nekoliko povecan, da preprecimo prelivanje kapljevine
cez rob
*
* :odstopek tlaka na sekundarni strani (1.1 bar) zmanjsan z
dvigom
*   tcold na zgornjo tolerancno mejo (+0.5 k) --> psek skoraj
doseze
*   spodnjo toleranco (68.7 bar) : 68.59 bar
*
* :rcs tcold : 286.7 c +- 0.5 c (559.85 k)
*
*****************************************************************
*********
*
* prim. sistem: sg vstop
9110000 hl-sg sngljun
*! 9110101 902010000  501000000  1.0936e-02  0.57  0.46  00100
9110101 902010000  501000000  1.0936e-02  0.616  0.46  130100
9110201    0  6.36790e+00  6.56940e+00  0.00000e+00
*
* prim. sistem: sg vstopni prekat in u-cevi
5010000 sg-tube pipe
5010001 11
*! 5010101 0.04394  1  0.010342  11
5010101 0.04394  1  0.0103423  11
5010201 0  10
5010301 0.798  1  2.0  5  1.725  7  2.0  11
5010401 0  11
5010501 0  11
5010601 85.0  1  90.0  5  45.0  6  -45.0  7  -90.0  11
5010701 0.728  1  2.0  5  1.685  6  -1.685  7  -2.0  11
*! 5010801 0.1e-03  0.091  1  0.01e-03  0.01968  11
5010801 0.1e-05  0.091  1  0.01e-07  0.01968  11
*! 5010901 0.44  0.60  1  0.01  0.01  5  0.22  0.22  6  0.01
0.01  10
5010901 0.01  0.01  1  0.0  0.0  10
5011001 00 11
*! 5011101 00100  1  00000  10
5011101 100000  10
5011201 103  1.55556e+07  5.63746e+02  0.00000e+00    0  0  1
5011202 103  1.55187e+07  5.63172e+02  0.00000e+00    0  0  2
5011203 103  1.54826e+07  5.62658e+02  0.00000e+00    0  0  3
5011204 103  1.54466e+07  5.62198e+02  0.00000e+00    0  0  4
5011205 103  1.54105e+07  5.61784e+02  0.00000e+00    0  0  5
5011206 103  1.53771e+07  5.61454e+02  0.00000e+00    0  0  6
5011207 103  1.53587e+07  5.61159e+02  0.00000e+00    0  0  7
5011208 103  1.53523e+07  5.60864e+02  0.00000e+00    0  0  8
5011209 103  1.53457e+07  5.60605e+02  0.00000e+00    0  0  9
5011210 103  1.53391e+07  5.60379e+02  0.00000e+00    0  0 10
5011211 103  1.53325e+07  5.60180e+02  0.00000e+00    0  0 11
5011300 0
5011301  6.73340e+00  6.73340e+00  0.00000e+00    1
5011302  6.72420e+00  6.72420e+00  0.00000e+00    2
5011303  6.71600e+00  6.71600e+00  0.00000e+00    3
5011304  6.70880e+00  6.70880e+00  0.00000e+00    4
5011305  6.70230e+00  6.70230e+00  0.00000e+00    5
5011306  6.69730e+00  6.69730e+00  0.00000e+00    6
5011307  6.69270e+00  6.69270e+00  0.00000e+00    7
5011308  6.68790e+00  6.68790e+00  0.00000e+00    8
5011309  6.68370e+00  6.68370e+00  0.00000e+00    9
5011310  5.86580e+00  5.86580e+00  0.00000e+00   10
5011401  .01968  0.0  1.0  1.0   10
*
* prim. sistem: sg izstopni prekat
5130000  o-ch branch
5130001  1  0
*! 5130101  0.0  0.798  35.061e-03  0.0  -85.0  -0.728  0.1e-03
0.091  00
5130101  0.0  0.798  35.061e-03  0.0  -85.0  -0.728  0.1e-04
0.091  00
5130200 103  1.53427e+07  5.60188e+02
*! 5131101  501010000  513000000  0.010342  0.60  0.44  00100
5131101  501010000  513000000  0.0103423  0.3  0.2  130000
513*     6.67690e+00  6.96280e+00  0.00000e+00
*
  prim. sistem: sg izstop
9610000 sg-cl sngljun
*! 9610101 513010000  952000000  1.0936e-02  0.46  0.57  00100
9610101 513010000  952000000  1.0936e-02  0.01  0.02  130100
9610201    0  6.31440e+00  6.53290e+00  0.00000e+00
*
*
*****************************************************************
*********
*
* sek. sistem: dvizni kanal
5030000 riser pipe
5030001 6
5030101 0.0  6
5030201 0.01291  1  0.0214    4  0.048695  5
5030301 2.0      4  2.9605    5  0.8295    6
* povecanje mase sekundarnega hladila
*++ 5030401 0.11513  4  0.17171   5  0.04041   6
5030401 0.12513  4  0.18171   5  0.04041   6
5030501 0  6
5030601 90.0  6
5030701 2.0      4  2.9605    5  0.8295   6
5030801 0.1e-03  0.03503  5   0.1e-03  0.249  6
5030901 5.46  5.46  1  3.32  3.32  4  0.1  0.1  5
5031001 00  6
5031101 100100  4  100000  5
5031201 100  6.88635e+06  1.24544e+06  2.58278e+06  6.52236e-02
0.00000e+00   1
5031202 100  6.87346e+06  1.25147e+06  2.58289e+06  1.89380e-01
0.00000e+00   2
5031203 100  6.86224e+06  1.25111e+06  2.58298e+06  2.99390e-01
0.00000e+00   3
5031204 100  6.85241e+06  1.25062e+06  2.58305e+06  3.94690e-01
0.00000e+00   4
5031205 100  6.84126e+06  1.25006e+06  2.58314e+06  4.19940e-01
0.00000e+00   5
5031206 100  6.83290e+06  1.24938e+06  2.58318e+06  4.01720e-01
0.00000e+00   6
5031300 0
5031301  4.72634e-02  2.73670e-01  0.00000e+00   1
5031302  5.13251e-02  3.89160e-01  0.00000e+00   2
5031303  5.53478e-02  4.40620e-01  0.00000e+00   3
5031304  6.06000e-02  4.89430e-01  0.00000e+00   4
5031305  7.43053e-02  7.34650e-01  0.00000e+00   5
5031401  0.027   0.0   1.0   1.0  5
*          ++
*
* sek. sistem: separator pare
5070000 separ  separatr
5070001 3  0
5070101 0.0  1.9430  0.09467  0  90.0  1.9430  0.1e-04  0.249
00
5070200 100  6.82489e+06  1.24924e+06  2.58329e+06  1.46050e-01
5071101 507010000  510000000   4.8695e-02  0.82  0.14  01000
0.0
5072101 507000000  508000000  44.9150e-02  0.26  0.23  01000
0.0
5073101 503010000  507000000   4.8695e-02  0.0  0.0  01000
5071201 -9.28200e-02  3.06330e-01  0.00000e+00
5072201  4.68581e-03 -1.70166e-02  0.00000e+00
5073201  7.22506e-02  7.61480e-01  0.00000e+00
*
* sek. sistem: zgornji parni prostor
5100000 stmdome pipe
5100001 2
5100101 0.0  2
5100201 0.0  1
5100301 1.0800   1  0.4000    2
5100401 0.54287  1  0.134040  2
5100501  0.0  2
5100601 90.0  2
5100701 1.0800   1  0.4000    2
5100801 0.1e-03  0.8000  1  0.1e-03  0.41905  2
5100901 0.0  0.0  1
5101001 00  2
5101101 100000 1
5101201 102  6.81865e+06  1.00000e+00  0.00000e+00   0  0  1
5101202 102  6.81840e+06  1.00000e+00  0.00000e+00   0  0  2
5101300 0
5101301 -9.21296e-03  4.43731e-02  0.00000e+00   1
*
* sek. sistem: spoj uparjalnika in parovoda
5110000 sg-sl sngljun
5110101 510010000  520000000   0.0011401  0.222  1.0  130100
5110201    0  6.85760e+00  6.87050e+00  0.00000e+00
*
* sek. sistem: povratni kanal (zgornji obrocasti del)
5190000 udownann branch
5190001 1  0
5190101 0.0  1.9430  0.3078  0  90.0  1.9430  0.1e-03  0.1930
00
5190200 102  6.82494e+06  8.10100e-03
*5191101 510000000  519010000  0.44915  0.0  0.0  00100
5191101 510000000  519010000  0.0  0.5  0.5  130100
5191110 0.1930  0.0  1.0  1.0
5191201  3.04500e-01  3.67449e-04  0.00000e+00
*
* sek. sistem: povratni kanal (srednji obrocasti del)
5080000 mdownann branch
5080001 2  0
5080101 0.0  0.8275  0.081723  0  -90.0  -0.8275  0.1e-03
0.176  00
5080200 102  6.83416e+06  0.00000e+00
5081101 519000000  508000000  0.0  0.09  0.15  00000
*5082101 508010000  509000000  0.030415  0.0  0.0  00100
5082101 508010000  509000000  0.0  0.43  0.60  130100
5081110 0.1930  0.0  1.0  1.0
5082110 0.1760  0.0  1.0  1.0
5081201  1.76446e-04 -3.00110e-01  0.00000e+00
5082201  1.16890e-01  1.38490e-01  0.00000e+00
*
* sek. sistem: povratni kanal (spodnji cevni del)
5090000 pipedown pipe
5090001 5
5090101 0.0        5
```

```
5090201 0.0  1  0.005836  4
5090301 2.9625  1  2.0  5
5090401 0.06909  1  0.01167  4  0.01456  5
5090503  0  5
5090601 -90.0  5
5090701 -2.9625  1  -2.0  5
5090801 0.1e-03  0.05983  1  0.1e-03  0.0431  5
5090901 0.47  0.57  1  0.05  0.05  4
5091001 00  5
5091101 100100  1  100000  4
5091201 103  6.84845e+06  5.42776e+02  0.00000e+00  0  0  1
5091202 103  6.86706e+06  5.42788e+02  0.00000e+00  0  0  2
5091203 103  6.88200e+06  5.42799e+02  0.00000e+00  0  0  3
5091204 103  6.89700e+06  5.42811e+02  0.00000e+00  0  0  4
5091205 103  6.91205e+06  5.42849e+02  0.00000e+00  0  0  5
5091300 0
5091301  4.67180e-01  4.67180e-01  0.00000e+00  1
5091302  4.67090e-01  4.67090e-01  0.00000e+00  2
5091303  4.67080e-01  4.67080e-01  0.00000e+00  3
5091304  4.67080e-01  4.67080e-01  0.00000e+00  4
5091410  0.0431  0.0 1.0  1.0  4
*
*
* sek. sistem: spoj povratnega in dviznega kanala
* ni "abrupt area change" modela - regulacija recirkulacije
5350000  drs valve
5350101  509010000  503000000  0.025761  0.0  0.0  100000
5350201  0  1.05820e-01  1.44390e-01  0.00000e+00
5350300  srvvlv
5350301  524
5350401  0.01  0.01  0.01  * zaprto
5350402  1.0  1000.0  1000.0  * odprto
*
* ccci sg3 recirkulacija:  4x :  4 * 0.525 kg/s = 2.100 kg/s
20552400  reg535  sum  1.0  0.02847  0  3  0.01  1.0
20552401  0.0002100  -0.0001  mflowj  535000000  1.0  cntrlvar
524
*20552400  reg535  constant  1.0
*
**********************************************************************
*********
*
** dolocitev vpliva recirkulacije na maso sekundarnega hladila
** v uparjalniku :
**
** ccci sg3 recirkulacija: 0s: 1.050 kg/s = 2x ---> 1000s:
4.200 kg/s = 4x
*20552000  refflow  function  1.0  1.050  0
*20552001  time  0  520
**
*20252000  reac-t  0
*20252001  0.0  1.050  1000.0  4.200
**
*20552400  reg535  sum  1.0  0.0181838  0  3  0.01  1.0
*20552401  0.0 0.0001 cntrlvar 520 -0.0001 mflowj 535000000 1.0
cntrlvar 524
**
*
**********************************************************************
*********
* hhss                    toplotna telesa  sg 3
*
**********************************************************************
*********
*
* u cevi
15013000  10  4  2  1  0.00984
15013100  0  1
15013101  3  0.01111
15013201  3  3
15013301  0.0  3
15013401  570.330  1  566.810  2  563.420  3  560.15  4
* prim. -->
15013501  501020000  0  1  1  68.0  1
15013502  501030000  0  1  1  68.0  2
15013503  501040000  0  1  1  68.0  3
15013504  501050000  0  1  1  [illegible]  4
15013505  501060000  0  1  1  58.65  5
15013506  501070000  0  1  1  58.65  6
15013507  501080000  0  1  1  68.0  7
15013508  501090000  0  1  1  [illegible]  8
15013509  501100000  0  1  1  68.0  9
15013510  501110000  0  1  1  68.0  10
* --> sek.
15013601  503010000  0  1  1  68.0  1
15013602  503020000  0  1  1  68.0  2
15013603  503030000  0  1  1  68.0  3
15013604  503040000  0  1  1  68.0  4
15013605  503050000  0  1  1  58.65  5
15013606  503050000  0  1  1  58.65  6
15013607  503040000  0  1  1  68.0  7
15013608  503030000  0  1  1  68.0  8
15013609  503020000  0  1  1  68.0  9
15013610  503010000  0  1  1  68.0  10
*
15013701  0  0  0  0  10
15013801  0 10. 10. 0. 0.  0. 0.  1. 10
15013901  0 10. 10. 0. 0.  0. 0.  1. 10
*
* dividing plate in channel head
15011000  1  4  1  1  0.0
15011100  0  1
15011101  3  0.012
15011201  1  3
15011301  0.0  3
15011401  597.0  1  588.0  2  570.0  3  561.0  4
15011501  501010000  0  1  0  0.26643  1
15011601  513010000  0  1  0  0.26643  1
15011701  0  0  0  0  1
15011801  0 10. 10. 0. 0.  0. 0.  1. 1
15011901  0 10. 10. 0. 0.  0. 0.  1. 1
*
* cnannel head : zunanja stena --> plosca
15012000  2  4  1  1  0.0
15012100  0  1
15012101  3  0.0598
15012201  1  3
15012301  0.0  3
15012401  597.0  1  588.0  2  570.0  3  561.0  4
15012501  501010000  0  1  0  0.40167  1
15012502  513010000  0  1  0  0.40167  2
15012601  0  0  0  0  0.40167  1
15012602  0  0  0  0  0.40167  2
15012701  0  0  0  0  2
15012801  0 10. 10. 0. 0.  0. 0.  1. 2
15012901  0 10. 10. 0. 0.  0. 0.  1. 2
*
* tubesheet
15014000  2  4  1  1  0.0
15014100  0  1
15014101  3  0.1845
15014201  1  3
15014301  0.0  3
15014401  597.0  1  588.0  2  570.0  3  561.0  4
15014501  501010000  0  1  0  0.1139  1
15014502  513010000  0  1  0  0.1139  2
15014601  509050000  0  1  0  0.1139  1
15014602  503010000  0  1  0  0.1139  2
15014701  0  0  0  0  2
15014801  0 10. 10. 0. 0.  0. 0.  1. 2
15014901  0 10. 10. 0. 0.  0. 0.  1. 2
*
* riser (brez upper cylindrical shell) --> plosca: hhll
15031000  5  4  1  1  0.0
15031100  0  1
15031101  3  0.0159
15031201  1  3
15031301  1.0  3
15031401  597.0  1  588.0  2  570.0  3  561.0  4
15031501  503010000  0  1  0  2.895  1
15031502  503020000  0  1  0  2.895  2
15031503  503030000  0  1  0  2.895  3
15031504  503040000  0  1  0  2.895  4
15031505  503050000  0  1  0  4.286  5
15031601  0  0  0  0  2.895  1
15031602  0  0  0  0  2.895  2
15031603  0  0  0  0  2.895  3
15031604  0  0  0  0  2.895  4
15031605  0  0  0  0  4.286  5
15031701  10231  0.2  0  0  5
15031801  0 10. 10. 0. 0.  0. 0.  1. 5
15031901  0 10. 10. 0. 0.  0. 0.  1. 5
*
* upper-inner cylindrical shell --> plosca
15032000  2  4  1  1  0.0
15032100  0  1
15032101  3  0.005
15032201  1  3
15032301  0.0  3
15032401  597.0  1  588.0  2  570.0  3  561.0  4
15032501  508010000  0  1  0  0.6633  1
15032502  519010000  0  1  0  1.5537  2
15032601  503060000  0  1  0  0.6633  1
15032602  507010000  0  1  0  1.5537  2
15032701  0  0  0  0  2
15032801  0 10. 10. 0. 0.  0. 0.  1. 2
15032901  0 10. 10. 0. 0.  0. 0.  1. 2
*
* upper sleve and upper head ---> plosce 15101...15104
15101000  1  4  1  1  0.0
15101100  0  1
15101101  3  0.0210
15101201  1  3
15101301  0.0  3
15101401  597.0  1  588.0  2  570.0  3  561.0  4
15101501  0  0  0  0  1.005  1
15101601  510020000  0  1  0  1.005  1
15101701  0  0  0  0  1
15101801  0 10. 10. 0. 0.  0. 0.  1. 1
15101901  0 10. 10. 0. 0.  0. 0.  1. 1
*
15102000  1  4  1  1  0.0
15102100  0  1
15102101  3  0.0258
15102201  1  3
15102301  0.0  3
15102401  597.0  1  588.0  2  570.0  3  561.0  4
15102501  0  0  0  0  3.3870  1
```

```
15102601  510010000  0  1  0  3.3870  1
15102701  0  0    0  0  1
15102801  0 10. 10. 0. 0.  0. 0.  1. 1
15102901  0 10. 10. 0. 0.  0. 0.  1. 1
*
15103000  1  4  1  1  0.0
15103100  0  1
15103101  3  0.0947
15103201  1  3
15103301  0.0  3
15103401  597.0  1   588.0  2   570.0  3   561.0  4
15103501  0  0  0  0  0.4463  1
15103601  519010000  0  1  0  0.4463  1
15103701  0  0    0  0  1
15103801  0 10. 10. 0. 0.  0. 0.  1. 1
15103901  0 10. 10. 0. 0.  0. 0.  1. 1
*
15104000  1  4  1  1  0.0
15104100  0  1
15104101  3  0.0245
15104201  1  3
15104301  0.0  3
15104401  597.0  1   588.0  2   570.0  3   561.0  4
15104501  0  0  0  0  3.2448  1
15104601  508010000  0  1  0  3.2448  1
15104701  0  0    0  0  1
15104801  0 10. 10. 0. 0.  0. 0.  1. 1
15104901  0 10. 10. 0. 0.  0. 0.  1. 1
*
* downcomer --> plosce 5091-01, 5092-01-02-03-04
15091000  1  4  1  1  0.0
15091100  0  1
15091101  3  0.00394
15091201  1  3
15091301  0.0  3
15091401  597.0  1   588.0  2   570.0  3   561.0  4
15091501  0  0  0  0  4.0116  1
15091601  509010000  0  1  0  4.0116  1
15091701  0  0    0  0  1
15091801  0 10. 10. 0. 0.  0. 0.  1. 1
15091901  0 10. 10. 0. 0.  0. 0.  1. 1
*
15092000  4  4  1  1  0.0
15092100  0  1
15092101  3  0.00276
15092201  1  3
15092301  0.0  3
15092401  597.0  1   588.0  2   570.0  3   561.0  4
15092501  0  0  0  0  1.2028  1
15092502  0  0  0  0  1.2028  2
15092503  0  0  0  0  1.2028  3
15092504  0  0  0  0  1.2028  4
15092600  509020000  0  1  0  1.2028  1
15092601  509030000  0  1  0  1.2028  2
15092603  509040000  0  1  0  1.2028  3
15092604  509050000  0  1  0  1.2028  4
15092701  0  0    0  0  4
15092801  0 10. 10. 0. 0.  0. 0.  1. 4
15092901  0 10. 10. 0. 0.  0. 0.  1. 4
*
*
*********************************************************************
*********
* ssggccvv          sg 3  kontrolne spremenljivke
*
*********************************************************************
*********
*
* cv 503: sg3: nivo v povratnem kanalu [m]
20550300  levdc  sum  1.0  13.45  1
20550301  0.0  2.0    voidf 509050000  2.0    voidf  509040000
20550302       2.0    voidf 509030000  2.0    voidf  509020000
20550303       2.9625 voidf 509010000  0.8275 voidf  508010000
20550304       1.9430 voidf 519010000
*
* cv 505: sg3: masa sekundarnega hladila [kg]
20550500  ssgmass  sum  1.0  790.0  1
*++ 20550501  0.0  0.11513  rho 503010000  0.11513  rho
503020000
*++ 20550502       0.11513  rho 503030000  0.11513  rho
503040000
*++ 20550503       0.17171  rho 503050000  0.04041  rho
503060000
20550501  0.0  0.12513  rho 503010000  0.12513  rho 503020000
20550502       0.12513  rho 503030000  0.12513  rho 503040000
20550503       0.18171  rho 503050000  0.04041  rho 503060000
20550504       0.09466  rho 507010000  0.54287  rho 510010000
20550505       0.13404  rho 510020000  0.30780  rho 519010000
20550506       0.08172  rho 508010000  0.06909  rho 509010000
20550507       0.01167  rho 509020000  0.01167  rho 509030000
20550508       0.01167  rho 509040000  0.01456  rho 509050000
*
*
*********************************************************************
*********
* mmff                    main feedwater 3
*
*********************************************************************
*********
*
* konstantni mfw tok
*
5340000 mfw tmdpjun
5340101 531000000  532000000  0.0266
5340200 1  505  * si
5340201 -1.0  0.52517   0.  0.
5340202  0.0  0.52517   0.  0.
5340203  6.0  0.0       0.  0.
*
* volumski mfw tok
*20550200   vmfw  div  1.0   0.0   1
*20550201   rhof  532010000  mflowj  532010000
*
* feedwater line
5320000 fwline branch
5320001 1  0
5320101 5.557e-04  10.0  0  0  60.0  7.0  0.01e-03  0.0266  00
5320200 103  6.86275e+06  4.90974e+02
*5321101 532010000 508000000  0.0006786  0.  0.  00100
5321101 532010000 508000000  0.0  1.0  0.  130100
5321201  1.11560e+00  1.11560e+00  0.00000e+00
*
* vir napajalne vode
5310000 fwsource tmdpvol
5310101 1.0  0.0  10.0  0  0  0  0.01e-03  0.0  00
5310200 103
5310201 0  70.0+5  491.0
*
*********************************************************************
*********
*
* ccci "regulacija" sg3 nivoja
* ob konstantni mfw 534 reguliramo nivo v povratnem kanalu
*
5290000 v529 tmdpvol
5290101 1.0  0.0  10.0  0.0  0.0  0.0  0.2e-03  0.0  0
5290200 103
5290201 0  70.0+5  491.0
*
5300000 j530 tmdpjun
5300101 529000000  519010000  0.0
5300200 1  0  cntrlvar 503   * sg level
5300201  -1.0      0.0       0.0   0.0
5300202  13.35     1.5       0.0   0.0
5300203  13.45     0.0       0.0   0.0
5300204  13.55    -1.5       0.0   0.0
*
*5300000 j530 tmdpjun
*5300101 529000000  519010000  0.0
*5300200 1  0  cntrlvar 505   * sg mass
*5300201  -1.0      0.0       0.0   0.0
*5300202  790.0     1.5       0.0   0.0
*5300203  800.0     0.0       0.0   0.0
*5300204  810.0    -0.50      0.0   0.0
*
*
*********************************************************************
*********
* ssll                      parovod 3
*
*********************************************************************
*********
*
* steam line from porv+sv+msiv
5200000 stmline  snglvol
5200101 0.0  31.65  68.5e-03  0  -45.0  -18.670  0.01-3  0.0525
00
5200200 102  6.81255e+06  1.00000e+00
*
* hhss
* 15201000  1  4  2  1  0.0525
15201000  1  4  2  0  0.0525  * ff11
15201100  0  1
15201101  3  0.0603
15201201  1  3
15201301  0.0  3
15201401  570.330  1  566.810  2  563.420  3  560.15  4
15201501  520010000   0   1   1   31.65   1
15201601  0  0  0  1  31.65  1
15201701  0  0    0    0    1
15201801  0 10. 10. 0. 0.  0. 0.  1. 1
15201901  0 10. 10. 0. 0.  0. 0.  1. 1
*
*
*********************************************************************
*********
* ccci    regulacija tcold 3 preko tlaka sekundarne strani
*
*********************************************************************
*********
*
* delta tcold : bethsy referenca : 559.85 k
20550000  dtcold  sum  1.0  0.0  0
20550001  560.35  -1.0  tempf  955010000
* 20550001  559.35  -1.0  tempf  955010000  * !@
*
20554400  p544  sum  1.0  68.12e+05  0
```

```
20554401  0.0  1.0  p  544010000  300.  cntrlvar 500
*
5150000  venturi  snqljun
5150101  520010000  544000000  0.0  0.0  0.0  130000
5150201   0  6.87740e+00  6.87740e+00  0.00000e+00
*
5440000  turbine  tmdpvol
5440101  10.0  0.0  1000.0  0  0.0  0  0.2e-03  0  0
5440200  2  0  cntrlvar 544
5440201   -1.0       68.12e+05    1.0
5440202    1.0e+05    1.0e+05    1.0
5440203  100.0e+05  100.0e+05    1.0
*
*
************************************************************
*********
* rrccss            cevovodi primarnega kroga 3
*
************************************************************
*********
*
* * prim. sistem: hot leg do surge line
* 9030000 hleg  snglvol
* 9030101 0.010936  1.4441  0.0  0.0  0.0  0.0  0.1e-03  0.1180
00
* 9030200 103  1.55957e+07  5.63790e+02
*
9030000 hleg  pipe
9030001 5
9030101 0.010936 5
9030201 0.010936 4
9030301 0.28882  5
9030401 0.0  5
9030501 0.0  5
9030601 0.0  5
9030701 0.0  5
9030801 0.1e-03  0.1180  5
9030901 0.0  0.0  4
9031001 00    5
9031101 100000  4  *fvcahs:v=0
*                  should be input as not used
9031201 103  1.55942e+07  5.63762e+02  0.00000e+00   0  0  1
9031202 103  1.55935e+07  5.63762e+02  0.00000e+00   0  0  2
9031203 103  1.55928e+07  5.63762e+02  0.00000e+00   0  0  3
9031204 103  1.55921e+07  5.63762e+02  0.00000e+00   0  0  4
9031205 103  1.55914e+07  5.63762e+02  0.00000e+00   0  0  5
9031300 0
9031301  6.36760e+00  6.36760e+00  0.00000e+00   1
9031302  6.36760e+00  6.36760e+00  0.00000e+00   2
9031303  6.36760e+00  6.36760e+00  0.00000e+00   3
9031304  6.36760e+00  6.36760e+00  0.00000e+00   4
*
* prim. sistem: hot leg spoj pri sl
9130000 hl913 snqljun
*! 9130101 903010000  902000000  0.0  0.0  0.0  00000
9130101 903010000  902000000  0.0  0.265  0.265  130000
9130201   0  6.36770e+00  6.36770e+00  0.00000e+00
*
* prim. sistem: hot leg od sl do sg
* 9020000 hleg  pipe
* 9020001 2
* 9020101 0.010936 2
* 9020201 0.010936 1
* 9020301 1.1891  1  1.8558  2
* 9020401 0.0  2
* 9020501 0.0  2
* 9020601 9.0  1  70.0  2
* 9020701 0.1800  1  1.7317  2
* 9020801 0.1e-03  0.1180  2
* *! 9020901 0.31  0.31  1
* 9020901 0.24  0.24  1
* 9021001 00    2
* 9021101 100000  1
* 9021201 103  1.55880e+07  5.63790e+02  0.00000e+00   0  0  1
* 9021202 103  1.55738e+07  5.63790e+02  0.00000e+00   0  0  2
* 9021300 0
* 9021301  6.29920e+00  6.29920e+00  0.00000e+00   1
*
9020000 hleg  pipe
9020001 10
9020101 0.010936 10
9020201 0.010936  9
9020301 0.23782   5  0.37116  10
9020401 0.0  10
9020501 0.0  10
9020601 9.0  5  70.0  10
9020701 0.036  5  0.34634  10   * ++
9020801 0.1e-03  0.1180    10
9020901 0.0267  0.0267  9
9021001 00    10
9021101 100000 5  100000  9    * v=0
9021201 103  1.55866e+07  5.63760e+02  0.00000e+00   0  0  1
9021202 103  1.55853e+07  5.63760e+02  0.00000e+00   0  0  2
9021203 103  1.55841e+07  5.63760e+02  0.00000e+00   0  0  3
9021204 103  1.55829e+07  5.63759e+02  0.00000e+00   0  0  4
9021205 103  1.55816e+07  5.63759e+02  0.00000e+00   0  0  5
9021206 103  1.55791e+07  5.63758e+02  0.00000e+00   0  0  6
9021207 103  1.55752e+07  5.63757e+02  0.00000e+00   0  0  7
9021208 103  1.55714e+07  5.63756e+02  0.00000e+00   0  0  8
9021209 103  1.55676e+07  5.63755e+02  0.00000e+00   0  0  9
9021210 103  1.55637e+07  5.63754e+02  0.00000e+00   0  0 10
9021300 0
9021301  6.36770e+00  6.36770e+00  0.00000e+00   1
9021302  6.36770e+00  6.36770e+00  0.00000e+00   2
9021303  6.36770e+00  6.36770e+00  0.00000e+00   3
9021304  6.36770e+00  6.36770e+00  0.00000e+00   4
9021305  6.36770e+00  6.36770e+00  0.00000e+00   5
9021306  6.36780e+00  6.64560e+00  0.00000e+00   6
9021307  6.36780e+00  6.64560e+00  0.00000e+00   7
9021308  6.36780e+00  6.64570e+00  0.00000e+00   8
9021309  6.36790e+00  6.64580e+00  0.00000e+00   9
*
************************************************************
*********
* sg
************************************************************
*********
*
* prim. sistem: intermediate leg down
* 9520000 ileg_a  pipe
* 9520001 2
* 9520101 0.010936  2
* 9520201 0.010936  1
* 9520301 2.5122  1  2.0697  2
* 9520401 0.0  2
* 9520501 0.0  2
* 9520601 -76.0  1  -72.0  2
* 9520701 -2.4337  1  -1.9670  2
* *! 9520801 0.1e-03  0.1180  2
* 9520801 0.1e-04  0.1180  2
* *! 9520901 0.11  0.11  1
* 9520901 0.1  0.1  1
* 9521001 00  2
* 9521101 100000  1
* 9521201 103  1.53406e+07  5.60210e+02  0.00000e+00   0  0  1
* 9521202 103  1.53516e+07  5.60220e+02  0.00000e+00   0  0  2
* 9521300 0
* 9521301  6.24650e+00  6.24650e+00  0.00000e+00   1
*
9520000 ileg_a  pipe
9520001 10
9520101 0.010936  10
9520201 0.010936  9
9520301 0.50244  5  0.41394  10
9520401 0.0  10
9520501 0.0  10
9520601 -76.0  5  -72.0  10
9520701 -0.48674  5  -0.39340  10   *++
*! 9520801 0.1e-03  0.1180  10
9520801 0.1e-04  0.1180  10
*! 9520901 0.11  0.11  9
9520901 0.011  0.011  9
9521001 00  10
9521101 100000  9
9521201 103  1.53271e+07  5.60182e+02  0.00000e+00   0  0  1
9521202 103  1.53297e+07  5.60183e+02  0.00000e+00   0  0  2
9521203 103  1.53323e+07  5.60185e+02  0.00000e+00   0  0  3
9521204 103  1.53349e+07  5.60186e+02  0.00000e+00   0  0  4
9521205 103  1.53375e+07  5.60187e+02  0.00000e+00   0  0  5
9521206 103  1.53398e+07  5.60188e+02  0.00000e+00   0  0  6
9521207 103  1.53418e+07  5.60189e+02  0.00000e+00   0  0  7
9521208 103  1.53439e+07  5.60189e+02  0.00000e+00   0  0  8
9521209 103  1.53459e+07  5.60190e+02  0.00000e+00   0  0  9
9521210 103  1.53480e+07  5.60191e+02  0.00000e+00   0  0 10
9521300 0
9521301  6.31450e+00  6.59410e+00  0.00000e+00   1
9521302  6.31450e+00  6.59400e+00  0.00000e+00   2
9521303  6.31450e+00  6.59400e+00  0.00000e+00   3
9521304  6.31440e+00  6.59400e+00  0.00000e+00   4
9521305  6.31440e+00  6.59390e+00  0.00000e+00   5
9521306  6.31440e+00  6.59390e+00  0.00000e+00   6
9521307  6.31440e+00  6.59390e+00  0.00000e+00   7
9521308  6.31440e+00  6.59380e+00  0.00000e+00   8
9521309  6.31440e+00  6.59380e+00  0.00000e+00   9
*
9630000 jun963 snqljun
*! 9630101 952010000  953000000  0.0  0.20  0.20  130000
9630101 952010000  953000000  0.0  0.0  0.0  130000
9630201   0  6.31430e+00  6.59380e+00  0.00000e+00
*
* * prim. sistem: intermediate leg
* 9530000  ileg_b  snglvol
* 9530101 0.010936  1.1027  0.0  0.0  9.0  0.180  0.1e-03
0.1180  00
* 9530200 103  1.53553e+07  5.60220e+02
*
9530000 ileg_b  pipe
9530001 5
9530101 0.010936 5
9530201 0.010936 4
9530301 0.22054  5
9530401 0.0  5
9530501 0.0  5
9530601 9.0  5
9530701 0.036  5
9530801 0.1e-03  0.1180  5
9530901 0.0  0.0  4
9531001 00    5
```

```
9531101 100000  4  *fvcahs:v=0
*                    should be input as not used
9531201 103  1.53487e+07  5.60192e+02  0.00000e+00   0  0  1
9531202 103  1.53479e+07  5.60191e+02  0.00000e+00   0  0  2
9531203 103  1.53471e+07  5.60191e+02  0.00000e+00   0  0  3
9531204 103  1.53463e+07  5.60191e+02  0.00000e+00   0  0  4
9531205 103  1.53455e+07  5.60191e+02  0.00000e+00   0  0  5
9531300 0
9531301  6.31430e+00  6.31430e+00  0.00000e+00   1
9531302  6.31440e+00  6.31440e+00  0.00000e+00   2
9531303  6.31440e+00  6.31440e+00  0.00000e+00   3
9531304  6.31440e+00  6.31440e+00  0.00000e+00   4
*
9640000 jun964 sngljun
*! 9640101 953010000  954000000  0.0  0.20  0.20  00000
9640101 953010000  954000000  0.0  0.0  0.0  130000
9640201   0  6.31440e+00  6.31440e+00  0.00000e+00
*
* * prim. sistem: intermediate leg up
* 9540000  ileg_c  snglvol
* *9540101 0.010936  1.7870  0.0  0.0  90.0  1.7870  0.1e-03
0.1180  00
* 9540101 0.010936  1.7871  0.0  0.0  90.0  1.7871  0.1e-03
0.1180  00
* *++ podaljsek 0.1 mm zaradi sklenitve rcs elevacij v rx
(napaka baze pod.)
* 9540200 103  1.53446e+07  5.60220e+02
*
9540000 ileg_c  pipe
9540001 5
9540101 0.010936 5
9540201 0.010936 4
9540301 0.35742  5
9540401 0.0  5
9540501 0.0  5
9540601 90.0  5
9540701 0.35742  5
9540801 0.1e-03  0.1180  5
9540901 0.0  0.0  4
9541001 00    5
9541101 100000  4  *fvcahs:v=0
*                    should be input as not used
9541201 103  1.53434e+07  5.60191e+02  0.00000e+00   0  0  1
9541202 103  1.53399e+07  5.60190e+02  0.00000e+00   0  0  2
9541203 103  1.53364e+07  5.60189e+02  0.00000e+00   0  0  3
9541204 103  1.53329e+07  5.60188e+02  0.00000e+00   0  0  4
9541205 103  1.53294e+07  5.60186e+02  0.00000e+00   0  0  5
9541300 0
9541301  6.31440e+00  6.59380e+00  0.00000e+00   1
9541302  6.31440e+00  6.59390e+00  0.00000e+00   2
9541303  6.31450e+00  6.59400e+00  0.00000e+00   3
9541304  6.31450e+00  6.59400e+00  0.00000e+00   4
*
*
************************************************************
*********
*                              rcp-3
RCP+ *
************************************************************
*********
*
9000000 in3 branch
9000001 1  0
9000101 0.010936  0.232  0.0  0.0  90.0  0.232  0.01e-04  0.118
00
9000200 100  1.56151e+07  1.24842e+06  2.44514e+06  0.00000e+00
9001101 954010000 900000000  0.0  0.0  0.0  130000
9001201 6.31570e+00  6.59530e+00  0.00000e+00
*
* pump loop 3
7030000  pump3 pump
7030101  0.0  0.097  14.0628e-03  0.0  60.0  0.084  00
7030108  900010000  0.  0.47  0.49  100000  *++ upor ustavljene
crpalke ?
7030109  901000000  0.  0.49  0.47  100000
7030200   0  1.56151e+07  1.24842e+06  2.44514e+06  0.00000e+00
7030201   0  6.31570e+00  6.59530e+00  0.00000e+00
7030202   0  1.06000e+00  1.06000e+00  0.00000e+00
* pump index and option card
7030301  -2  0  -2  -1  0  505  0   * trip 505: si -> pump 3
stop
* pump description card
*! 7030302  311.0  1.0  0.063056  78.0  0.0
7030302  311.0  1.0  0.067939  78.0  0.0
* 7030302  311.0  1.0  0.068797 78.0  0.0   * !#
7030303  5.0  751.0  0.0  0.0  74.39  71.39  0.0  *++ rated
density
* mh  two phase pump head multiplier tables
7033000  0  0.0  0.0,  0.2  0.0,  0.4  1.0,  0.9  1.0,  1.0
0.0
* mt  two phase pump torque multiplier tables
7033100  0  0.0  0.0,  0.2  0.0,  0.4  1.0,  0.9  1.0,  1.0
0.0
*
* pump velocity table (rad/s)
7036100  505
7036101  300.0  311.0
7036102  305.0  201.0   310.0  141.1
7036103  320.0  113.1   330.0   88.0
7036104  340.0   75.4   350.0   62.8
7036105  370.0   47.1   400.0   37.7
7036106  500.0   22.0   700.0   15.7
7036107  916.0   10.5   917.0    0.0
*
*
9010000 out3 branch
9010001 1  0
9010101 0.0  0.084  5.460e-03  0.0  -90.0  -0.084  0.01e-04
0.0  00
9010200 100  1.56151e+07  1.24842e+06  2.44514e+06  0.00000e+00
9011101 901010000 955000000  0.0  0.0  0.0  130000
9011201 6.31570e+00  6.59530e+00  0.00000e+00
*
*
************************************************************
*********
*
* hhll-hhss rcp3
17030000  1  3  1  1  0.0
17030100  0  1
17030101  2  0.1
17030201  1  2
17030301  1.0  2
17030401  560.0  3
17030501  703010000  0  1  1  1.0  1
17030601  0          0  0  1  1.0  1
17030701  10701  1.0  0.0  0.0  1
17030801  0. 10. 10. 0. 0. 0. 0. 1. 1
*
*
************************************************************
*********
*
* * prim. sistem: cold leg a
* 9550000 cleg_a branch
* 9550001 1  0
* *! 9550101 0.010936  1.8656  0.0  0.0  0.0  0.0  0.1e-03
0.1180  00
* 9550101 0.010936  1.8656  0.0  0.0  0.0  0.0  0.1e-04  0.1180
00
* 9550200 103  1.58910e+07  5.60350e+02
* *! 9551101 955010000  956000000  0.0  0.07  0.07  00000
* 9551101 955010000 956000000  0.0  0.002  0.002  130000
* 9551201  6.24130e+00  6.24130e+00  0.00000e+00
*
9550000 cleg_a  pipe
9550001 5
9550101 0.010936 5
9550201 0.010936 4
* 9550301 0.37312  5
9550301 0.24875  5  * RCP+
9550401 0.0  5
9550501 0.0  5
9550601 0.0  5
9550701 0.0  5
9550801 0.1e-03  0.1180  5
9550901 0.0  0.0  4
9551001 00    5
9551101 100000  4  *fvcahs:v=0
*                    should be input as not used
9551201 103  1.58753e+07  5.60350e+02  0.00000e+00   0  0  1
9551202 103  1.58745e+07  5.60349e+02  0.00000e+00   0  0  2
9551203 103  1.58736e+07  5.60349e+02  0.00000e+00   0  0  3
9551204 103  1.58727e+07  5.60349e+02  0.00000e+00   0  0  4
9551205 103  1.58718e+07  5.60349e+02  0.00000e+00   0  0  5
9551300 0
9551301  6.30980e+00  6.30980e+00  0.00000e+00   1
9551302  6.30980e+00  6.30980e+00  0.00000e+00   2
9551303  6.30980e+00  6.30980e+00  0.00000e+00   3
9551304  6.30980e+00  6.30980e+00  0.00000e+00   4
*
9580000 jun958 sngljun
9580101 955010000  956000000  0.0  0.002  0.002  130000
9580201   0  6.30980e+00  6.30980e+00  0.00000e+00
*
* * prim. sistem: cold leg b
* 9560000 cleg_b  snglvol
* *! 9560101 0.010936  1.8656  0.0  0.0  0.0  0.0  0.1e-03
0.1180  00
* 9560101 0.010936  1.8656  0.0  0.0  0.0  0.0  0.1e-04  0.1180
00
* 9560200 103  1.58875e+07  5.60350e+02
*
9560000 cleg_b  pipe
9560001 5
9560101 0.010936 5
9560201 0.010936 4
9560301 0.37312  5
9560401 0.0  5
9560501 0.0  5
9560601 0.0  5
9560701 0.0  5
9560801 0.1e-03  0.1180  5
9560901 0.0  0.0  4
9561001 00    5
9561101 100000  4  *fvcahs:v=0
*                    should be input as not used
9561201 103  1.58708e+07  5.60349e+02  0.00000e+00   0  0  1
```

```
9561202 103  1.58700e+07  5.60349e+02  0.00000e+00   0  0  2
9561203 103  1.58691e+07  5.60349e+02  0.00000e+00   0  0  3
9561204 103  1.58682e+07  5.60349e+02  0.00000e+00   0  0  4
9561205 103  1.58673e+07  5.60349e+02  0.00000e+00   0  0  5
9561300 0
9561301  6.30990e+00  6.30990e+00  0.00000e+00   1
9561302  6.30990e+00  6.30990e+00  0.00000e+00   2
9561303  6.30990e+00  6.30990e+00  0.00000e+00   3
9561304  6.30990e+00  6.30990e+00  0.00000e+00   4
*
*****************************************************************
*********
* hhss            toplotna telesa - primarni cevovod 3
*
*****************************************************************
*********
*
* vsa toplotna telesa primarnih cevovodov so poenostavljena v
plosce
*
* * hot leg - cev s prirobnicami: hhll
* 19021000  3  4  1  1  0.0
* 19021100  0  1
* 19021101  3  0.0286
* 19021201  1  3
* 19021301  1.0  3
* 19021401  597.0  1   588.0  2   570.0  3   561.0  4
* 19021501  903010000  0  1  0  0.5353  1
* 19021502  902010000  0  1  0  0.4408  2
* 19021503  902020000  0  1  0  0.6879  3
* 19021601  0  0  0  0  0.5353  1
* 19021602  0  0  0  0  0.4408  2
* 19021603  0  0  0  0  0.6879  3
* 19021701  10232  0.333  0  0  3
* 19021801  0 10. 10. 0. 0.  0. 0.  1. 3
* 19021901  0 10. 10. 0. 0.  0. 0.  1. 3
*
* hot leg - cev s prirobnicami: hhll
19021000  15  4  1  1  0.0
19021100  0  1
19021101  3  0.0286
19021201  1  3
19021301  1.0  3
19021401  597.0  1   588.0  2   570.0  3   561.0  4
19021501  903010000  10000  1  0  0.1070   5
19021502  902010000  10000  1  0  0.0881  10
19021503  902060000  10000  1  0  0.1376  15
19021601  0  0  0  0  0.1070   5
19021602  0  0  0  0  0.0881  10
19021603  0  0  0  0  0.1376  15
19021701  10232  0.0667  0  0  15
19021801  0 10. 10. 0. 0.  0. 0.  1. 15
19021901  0 10. 10. 0. 0.  0. 0.  1. 15
*
* * intermediate leg - cev s prirobnicami: hhll
* 19521C00  4  4  1  1  0.0
* 19521100  0  1
* 19521101  3  0.0226
* 19521201  1  3
* 19521301  1.0  3
* 19521401  597.0  1   588.0  2   570.0  3   561.0  4
* 19521501  952010000  0  1  0  0.9313  1
* 19521502  952020000  0  1  0  0.7673  2
* 19521503  953010000  0  1  0  0.4088  3
* 19521504  954010000  0  1  0  0.6625  4
* 19521601  0  0  0  0  0.9313  1
* 19521602  0  0  0  0  0.7673  2
* 19521603  0  0  0  0  0.4088  3
* 19521604  0  0  0  0  0.6625  4
* 19521701  10230  0.166  0  0  4
* 19521801  0 10. 10. 0. 0.  0. 0.  1. 4
* 19521901  0 10. 10. 0. 0.  0. 0.  1. 4
*
* intermediate leg - cev s prirobnicami: hhll
19521000  20  4  1  1  0.0
19521100  0  1
19521101  3  0.0226
19521201  1  3
19521301  1.0  3
19521401  597.0  1   588.0  2   570.0  3   561.0  4
19521501  552010000  10000  1  0  0.1863   5
19521502  952060000  10000  1  0  0.1535  10
19521503  953010000  10000  1  0  0.0818  15
19521504  954010000  10000  1  0  0.1325  20
19521601  0  0  0  0  0.1863   5
19521602  0  0  0  0  0.1535  10
19521603  0  0  0  0  0.0818  15
19521604  0  0  0  0  0.1325  20
19521701  10230  0.0332  0  0  20
19521801  0 10. 10. 0. 0.  0. 0.  1. 20
19521901  0 10. 10. 0. 0.  0. 0.  1. 20
*
* * cold leg - cev s prirobnicami: hhll
* 19551000  2  4  1  1  0.0
* 19551100  0  1
* 19551101  3  0.0279
* 19551201  1  3
* 19551301  1.0  3
* 19551401  597.0  1   588.0  2   570.0  3   561.0  4
* 19551501  955010000  0  1  0  0.6915  1
* 19551502  956010000  0  1  0  0.6915  2
* 19551601  0  0  0  0  0.6915  1
* 19551602  0  0  0  0  0.6915  2
* 19551701  10230  0.166  0  0  2
* 19551801  0 10. 10. 0. 0.  0. 0.  1. 2
* 19551901  0 10. 10. 0. 0.  0. 0.  1. 2
*
* cold leg - cev s prirobnicami: hhll
19551000  10  4  1  1  0.0
19551100  0  1
19551101  3  0.0279
19551201  1  3
19551301  1.0  3
19551401  597.0  1   588.0  2   570.0  3   561.0  4
19551501  955010000  10000  1  0  0.1383   5
19551502  956010000  10000  1  0  0.1383  10
19551601  0  0  0  0  0.1383   5
19551602  0  0  0  0  0.1383  10
19551701  10230  0.0332  0  0  10
19551801  0 10. 10. 0. 0.  0. 0.  1. 10
19551901  0 10. 10. 0. 0.  0. 0.  1. 10
*
*
*****************************************************************
*********
* ddhh3 :         dh korekcija nekaterih rcs3 tlacnih zaznaval
*
*****************************************************************
*********
*
* cv 920 : dh korigirano tlacno zaznavalo 902-10 [pa]
20592000  pk90202  sum  9.8067  0.0  1
20592001  0.0  0.10197 p 902100000  -0.15 rho 902100000  * R+
*
* cv 921 : dh korigirano tlacno zaznavalo 501-06 [pa]
20592100  pk50106  sum  9.8067  0.0  1
20592101  0.0  0.10197 p 501060000  -0.8425 rho 501060000
*
* cv 922 : dh korigirano tlacno zaznavalo 952-01 [pa]
20592200  pk95201  sum  9.8067  0.0  1
20592201  0.0  0.10197 p 952010000  -0.15 rho 952010000  * R+
*
* cv 923 : dh korigirano tlacno zaznavalo 952-10 [pa]
20592300  pk95202  sum  9.8067  0.0  1
20592301  0.0  0.10197 p 952100000   0.15 rho 952100000  * R+
*
* cv 924 : dh korigirano tlacno zaznavalo 954-05 [pa]
20592400  pk95401  sum  9.8067  0.0  1
20592401  0.0  0.10197 p 954050000   -0.15 rho 954050000  * R+
*
*
*****************************************************************
*********
** ccvvii        dpmeasured - gravity term - zanka 2
*
*****************************************************************
*********
**
** ta blok cv je uporabljan med rcs3 dp inicializacijo
** upostevane so vse dh korekcije tlacnih zaznaval
**
**
** cv 930 : dp31h [bar]
*20593000  dp31h  sum  1.0e-05  -0.0763  0
*20593001  0.0  1.0 p 902010000  -1.0 p 903010000  * dh=0.0m
**
**
** cv 931 : dp31v [bar]
*20593100  dp31v  sum  1.0e-05  -0.0792  0
***20593101  0.0  1.0 p 902020000  -1.0 p 902010000  1.0
cntrlvar 932
*20593101  0.0  1.0 cntrlvar 920  -1.0 p 902010000  1.0
cntrlvar 932
**
** cv 932 : dp31v gravity term [pa]
*20593200  dpgt  sum  9.8067  0.0  1
*20593201  0.0  1.7317  rho  902010000
**
**
** cv 933 : dp61 [bar]
*20593300  dp61  sum  1.0e-05  -0.0562  0
**20593301  0.0  1.0 p 501010000  -1.0 p 902020000  1.0
cntrlvar 934
*20593301  0.0  1.0 p 501010000  -1.0 cntrlvar 920  1.0
cntrlvar 934
**
** cv 934 : dp61 gravity term [pa]
*20593400  dpgt  sum  9.8067  0.0  1
*20593401  0.0  0.364  rho  902020000
**
**
** cv 935 : hot leg dp [bar]
*20593500  hldp  sum  1.0e-05  -0.2117  0
*20593501  0.0  1.0 p 501010000  -1.0 p 903010000  1.0 cntrlvar
936
**
** cv 936 : hldp gravity term [pa]
*20593600  dpgt  sum  9.8067  0.0  1
```

```
*20593601  0.0  2.0957  rho  902010000
**
**
** cv 937 : dp62x [bar]
*20593700  dp62x  sum  1.0e-05  -1.1424  0
**20593701  0.0  1.0 p 501060000  -1.0 p 501010000  1.0
cntrlvar 938
*20593701  0.0  1.0 cntrlvar 921  -1.0 p 501010000  1.0
cntrlvar 938
**
** cv 938 : dp62x gravity term [pa]
*20593800  dpgt  sum  9.8067  0.0  1
*20593801  0.0  9.2065  rho  501020000
**
**
** cv 939 : dp63x [bar]
*20593900  dp63x  sum  1.0e-05  -0.9681  0
**20593901  0.0  1.0 p 513010000  -1.0 p 501060000  1.0
cntrlvar 940
*20593901  0.0  1.0 p 513010000  -1.0 cntrlvar 921  1.0
cntrlvar 940
**
** cv 940 : dp63x gravity term [pa]
*20594000  dpgt  sum  9.8067  0.0  1
*20594001  0.0  -9.2065  rho  501080000
**
**
** cv 941 : steam generator dp [bar]
*20594100  sgdp  sum  1.0e-05  -2.1105  0
*20594101  0.0  1.0 p 513010000  -1.0 p 501010000  * dh=0.0m
**
**
** cv 942 : dp64 [bar]
*20594200  dp44  sum  1.0e-05  -0.1801  0
**20594201  0.0  1.0 p 952010000  -1.0 p 513010000  1.0
cntrlvar 943
*20594201  0.0  1.0 cntrlvar 922  -1.0 p 513010000  1.0
cntrlvar 943
**
** cv 943 : dp64 gravity term [pa]
*20594300  dpgt  sum  9.8067  0.0  1
*20594301  0.0  -0.364  rho  952010000
**
**
** cv 944 : dp32vg [bar]
*20594400  dp32vg  sum  1.0e-05  -0.0576  0
**20594401  0.0  1.0 p 952020600  -1.0 p 952010000  1.0
cntrlvar 945
*20594401  0.0  1.0 cntrlvar 923  -1.0 cntrlvar 922  1.0
cntrlvar 945
**
** cv 945 : dp32vg gravity term [pa]
*20594500  dpgt  sum  9.8067  0.0  1
**20594501  0.0  -4.4007  rho  952020000
**
**
** cv 946 : dp32vp [bar]
*20594600  dp32vp  sum  1.0e-05  -0.0634  0
**20594601  0.0  1.0 p 954010000  -1.0 p 952020000  1.0
cntrlvar 947
*20594601  0.0  1.0 cntrlvar 924  -1.0 cntrlvar 923  1.0
cntrlvar 947
**
** cv 947 : dp32vp gravity term [pa]
*20594700  dpgt  sum  9.8067  0.0  1
*20594701  0.0  1.967  rho  953010000
**
**
** cv 948 : intermediate leg dp [bar]
*20594800  ildp  sum  1.0e-05  -0.3011  0
**20594801  0.0  1.0 p 954010000  -1.0 p 513010000  1.0
cntrlvar 949
*20594801  0.0  1.0 cntrlvar 924  -1.0 p 513010000  1.0
cntrlvar 949
**
** cv 949 : ildp gravity term [pa]
*20594900  dpgt  sum  9.8067  0.0  1
*20594901  0.0  -2.797  rho  952020000
**
**
** cv 950 : dp32p [bar]
*20595000  dp32p  sum  1.0e-05  0.0  1
**20595001  0.0  1.0 p 955010000  -1.0 p 954010000  1.0
cntrlvar 951
*20595001  0.0  1.0 p 955010000  -1.0 cntrlvar 924  1.0
cntrlvar 951
**
** cv 951 : dp32p gravity term [pa]
*20595100  dpgt  sum  9.8067  0.0  1
*20595101  0.0  0.232  rho  954010000
**
**
** cv 952 : dp33h [bar]
*20595200  dp33h  sum  1.0e-05  -0.0303  0
*20595201  0.0  1.0 p 956010000  -1.0 p 955010000  * dh=0.0m
**
*****************************************************************
**********
**
** rx
**
** cv 953 : dp052 [bar]
*20595300  dp052  sum  1.0e-05  -0.5301  0
*20595301  0.0  1.0 p 119040000  -1.0 p 956010000  1.0 cntrlvar
954
**
** cv 954 : dp052 gravity term [pa]
*20595400  dpgt  sum  9.8067  0.0  1
*20595401  0.0  -4.498  rho  119030000
**
**
** cv 955 : dp053 [bar]
*20595500  dp053  sum  1.0e-05  -0.9551  0
*20595501  0.0  1.0 p 123010000  -1.0 p 119040000  1.0 cntrlvar
956
**
** cv 956 : dp053 gravity term [pa]
*20595600  dpgt  sum  9.8067  0.0  1
*20595601  0.0  -1.503  rho  119050000
**
**
** cv 957 : dp0200 [bar]
*20595700  dp0200  sum  1.0e-05  -1.2043  0
*20595701  0.0  1.0 p 141010000  -1.0 p 123010000  1.0 cntrlvar
958
**
** cv 958 : dp0200 gravity term [pa]
*20595800  dpgt  sum  9.8067  0.0  1
*20595801  0.0  5.552  rho  131070000
**
**
** cv 959 : dp023 [bar]
*20595900  dp0r3  sum  1.0e-05  -0.2780  0
*20595901  0.0  1.0 p 903010000  -1.0 p 141010000  1.0 cntrlvar
960
**
** cv 960 : dp0200 gravity term [pa]
*20596000  dpgt  sum  9.8067  0.0  1
*20596001  0.0  0.714  rho  141010000
**
**
** cv 961 : dp3 [bar]
*20596100  dp3  sum  1.0e-05  -2.8840  0
*20596101  0.0  1.0 p 903010000  -1.0 p 956010000  1.0 cntrlvar
962
**
** cv 962 : dp3 gravity term [pa]
*20596200  dpgt  sum  9.8067  0.0  1
*20596201  0.0  0.29  rho  903010000
**
**
*****************************************************************
*********
* sline                        surge line
*
*****************************************************************
*********
*
2120000 surlin2  pipe
2120001 3
2120101 1.445e-03  3
2120201 1.445e-03  2
2120301 0.8713  3
2120401 0.0  3
2120501 0.0  3
2120601 90.0  3
2120701 0.8713  3
2120801 0.1e-03  0.0429  3
2120901 0.12  0.12  2
2121001 00  3
2121101 100000 2
2121201 103  1.55561e+07  6.07063e+02  0.00000e+00   0  6  1
2121202 103  1.55506e+07  6.09028e+02  0.00000e+00   0  0  2
2121203 103  1.55453e+07  6.10258e+02  0.00000e+00   0  0  3
2121300 0
2121301 -9.16295e-04 -9.24924e-04  0.00000e+00   1
2121302 -9.19462e-04 -9.28149e-04  0.00000e+00   2
*
2220000 jun222 sngljun
2220101 215010000  212000000  0.0  0.12  0.12  130000
2220201   0 -9.11450e-04 -9.11456e-04  0.00000e+00
*
2150000 surlin5 pipe
2150001 4
2150101 1.445e-03  4
2150201 1.445e-03  3
2150301 0.85  1  2.0793  4
2150401 0.0  4
2150501 0.0  4
2150601 90.0  1  1.0  4
2150701 0.85  1  2.0793  4
2150801 0.1e-03  0.0429  4
2150901 0.12  0.12  3
2151001 00  4
2151101 100000 3
2151201 103  1.56035e+07  5.78967e+02  0.00000e+00   0  0  1
2151202 103  1.55933e+07  5.84051e+02  0.00000e+00   0  0  2
2151203 103  1.55792e+07  5.92217e+02  0.00000e+00   0  0  3
```

```
2151204 103  1.55655e+07  6.00374e+02  0.00000e+00   0  0  4
2151300 0
2151301 -8.67741e-04 -8.67743e-04  0.00000e+00   1
2151302 -8.80991e-04 -8.80991e-04  0.00000e+00   2
2151303 -8.96568e-04 -8.96568e-04  0.00000e+00   3
*
* connection to hot leg 1
2250000 jun225 sngljun
2250101 603010000  215000000  1.445e-03  0.21  0.76  130100
*                                                      **
2250201   0  1.10509e-04  1.10508e-04  0.00000e+00
*
* hhss surge line wall: hhll
12210000 7  4  2  1  0.02145
12210100 0   1
12210101 3   0.03015
12210201 1   3
12210301 1.0  3
12210401 618.00   4
12210501 215010000  0  1  1  0.8500  1
12210502 215020000  0  1  1  2.0793  2
12210503 215030000  0  1  1  2.0793  3
12210504 215040000  0  1  1  2.0793  4
12210505 212010000  0  1  1  0.8713  5
12210506 212020000  0  1  1  0.8713  6
12210507 212030000  0  1  1  0.8713  7
12210601 0  0  0  1  0.8500  1
12210602 0  0  0  1  2.0793  2
12210603 0  0  0  1  2.0793  3
12210604 0  0  0  1  2.0793  4
12210605 0  0  0  1  0.8713  5
12210606 0  0  0  1  0.8713  6
12210607 0  0  0  1  0.8713  7
12210701 10233  0.142  0  0  7
12210801 0. 10. 10. 0. 0. 0. 0. 1. 7
12210901 0. 10. 10. 0. 0. 0. 0. 1. 7
*
*
*
************************************************************
*********
*
*
* pprrzz                    tlacnik
*
*
*
************************************************************
*********
*
2210000 jun221 sngljun
2210101 212010000  203000000  0.0  0.91  0.034  130100
2210201   0 -9.23280e-04 -9.25788e-04  0.00000e+00
*
2030000 przpipe pipe
2030001 10
2030101 0.0  10
2030201 0.0   9
2030301 0.99670  1  1.21490  10
2030401 0.03005  1  0.04194  10
2030501  0.0  10
2030601 96.0  10
2030701 0.99670  1  1.2149    10
2030801 0.1e-03  0.0  10
2030901 0.0  0.0  9
2031001 00  10
2031101 100000 9
2031201 102  1.55396e+07  0.00000e+00  0.00000e+00   0  0  1
2031202 102  1.55328e+07  0.00000e+00  0.00000e+00   0  0  2
2031203 102  1.55254e+07  0.00000e+00  0.00000e+00   0  0  3
2031204 102  1.55195e+07  1.29000e-01  0.00000e+00   0  0  4
2031205 102  1.55167e+07  1.00000e+00  0.00000e+00   0  0  5
2031206 102  1.55155e+07  1.00000e+00  0.00000e+00   0  0  6
2031207 102  1.55143e+07  1.00000e+00  0.00000e+00   0  0  7
2031208 102  1.55130e+07  1.00000e+00  0.00000e+00   0  0  8
2031209 102  1.55118e+07  1.00000e+00  0.00000e+00   0  0  9
2031210 102  1.55106e+07  1.00000e+00  0.00000e+00   0  0 10
2031300 0
2031301  1.71838e-07  1.71839e-07  0.00000e+00   1
2031302 -6.74590e-07 -6.74595e-07  0.00000e+00   2
2031303 -2.89946e-06  5.46230e-01  0.00000e+00   3
2031304 -3.51120e-01  9.20837e-07  0.00000e+00   4
2031305 -5.53443e-02 -1.26818e-06  0.00000e+00   5
2031306 -6.58745e-02 -2.97642e-06  0.00000e+00   6
2031307 -5.54882e-02 -4.61856e-06  0.00000e+00   7
2031308 -4.91295e-02 -6.23250e-06  0.00000e+00   8
2031309 -3.94933e-02 -7.81372e-06  0.00000e+00   9
*
* hhss prz wall: hhll
* 12200000 10  4  1  1  0.0
12200000 10  4  1  0  0.0  * ffll
12200100 0  1
12200101 3  0.01609
12200201 1  3
12200301 1.0  3
12200401 597.0  1   588.0  2   570.0  3   561.0  4
12200501 203010000  0  1  0  0.78115   1
12200502 203020000  0  1  0  0.78115   2
12200503 203030000  0  1  0  0.78115   3
12200504 203040000  0  1  0  0.78115   4
12200505 203050000  0  1  0  0.78115   5
12200506 203060000  0  1  0  0.78115   6
12200507 203070000  0  1  0  0.78115   7
12200508 203080000  0  1  0  0.78115   8
12200509 203090000  0  1  0  0.78115   9
12200510 203100000  0  1  0  0.78115  10
12200601 0  0  0  0  0.78115   1
12200602 0  0  0  0  0.78115   2
12200603 0  0  0  0  0.78115   3
12200604 0  0  0  0  0.78115   4
12200605 0  0  0  0  0.78115   5
12200606 0  0  0  0  0.78115   6
12200607 0  0  0  0  0.78115   7
12200608 0  0  0  0  0.78115   8
12200609 0  0  0  0  0.78115   9
12200610 0  0  0  0  0.78115  10
12200701 10234  0.1  0  0  10
12200801 0. 10. 10. 0. 0. 0. 0. 1. 10
12200901 0. 10. 10. 0. 0. 0. 0. 1. 10
*
************************************************************
*********
*
* hhss prz heaters
12011000 1  4  1  1  0.0
12011100 0    1
12011101 3    0.00465
12011201 1   3
12011301 1.0   3
12011400 0
12011401 619.31 1    619.3  2   619.1  3   618.6  4
12011501 0           0  0  0  0.4882   1
12011601 203010000   0  1  0  0.4882   1
12011701 10218  1.0  0.0  0.0  1
12011801 0 10. 10. 0. 0.  0. 0.  1. 1
12011901 0 10. 10. 0. 0.  0. 0.  1. 1
*
20521800 przpow  function  1.0  1400.0  0
20521801 time 0  218
*
* ccci : grelec deluje le med inicializacijo
20221800 reac-t  0
20221801 -1.0  1400.0
20221802  0.0  1400.0
*
*
************************************************************
*********
*
* ccvv ctv 203 : prz level [m]
20520300 przlev  sum  1.0  4.08   1
20520301 0.0  0.9967  voidf  203010000  1.2149  voidf
203020000
20520302       1.2149  voidf  203030000  1.2149  voidf
203040000
20520303       1.2149  voidf  203050000  1.2149  voidf
203060000
20520304       1.2149  voidf  203070000  1.2149  voidf
203080000
20520305       1.2149  voidf  203090000  1.2149  voidf
203100000
*
*
************************************************************
*********
*  ccci            fik=irana tlak in nivo tlacnika
*
************************************************************
*********
*
* charging vol
7110000 charg tmdpvol
7110101 1.0  0.0  10.0  0  0  0  0  0  0
7110200 103
7110201 0  155.0e+05  565.0
*
* regulacija nivoja
7120000 jun712 tmdpjun
7120101 711000000 215000000  0.0
7120200 1  0  cntrlvar 203
7120201  3.0   2.0  0.0  0.0
7120202  4.08  0.0  0.0  0.0
7120203  5.0  -2.0  0.0  0.0
*
2320000 jun232 sngljun
2320101 231000000 203010000  0.0  0.0  0.0  130000
2320201   0  3.58579e-02  9.36504e-06  0.00000e+00
*
* umetni tlacnik
2310000 uprz tmdpvol
2310101 1.0  0.0  10.0  0.  0.  0.  0  0  0
2310200 102
2310201 0.0  155.1e+05  1.0
*
*
************************************************************
*********
```

```
* llpp                    l.p.s.i. in akumulatorji
*
*****************************************************************
*********
*
* trip 659 : odpre akumulatorja 2 in 3
* trip 658 : zapre akumulatorja 2 in 3
*++ trip 522 : vkljuci lpsi crpalki
*
*
*   accumulator vessel2
8330000   accumi2   accum
8330101   0.0  8.358  0.423  0.0  90.0  8.358  3.96-5   0.0
00
8330200   41.8+5   290.   0.0
* zeta iztoka je 0.335, zeta kolena je 0.2, upostevamo 5 kolen
8331101   805000000   0.00114   1.335  1.335  000000
8332200   0.286  0.0  0.119  0.119  0.00927  0  0  0
*
*   accumulator no 2   pipe
8050000   accul2   snglvol
8050101   0.0  21.  0.0239  0.0   20.0   10.005   1.0-4   0.0
00
8050200   3  4.23739e+06  2.90000e+02
*
*   accumulator no 2 valve
8060000   accv12   valve
* zeta kolena je 0.2, upostevamo 5 kolen od 10
8060101   805010000  856000000  0.00114  1.0  1.0   100000
8060201   0  0.00000e+00  0.00000e+00  0.00000e+00
*8060300  mtrvlv
*8060301  659   658   5.0   0.0
8060300  trpvlv
8060301  659
*
*
*   accumulator vessel3
9330000   accumi3   accum
9330101   0.0  8.358  0.423  0.0  90.0  8.358  3.96-5   0.0
00
9330200   41.8+5   290.   0.0
* zeta iztoka je 0.335, zeta kolena je 0.2, upostevamo 4 kolena
* od 8
9331101   905000000   0.00114   1.335  1.335  000000
9332200  0.286  0.0  0.119  0.119  0.00927  0  0  0
*
*   accumulator no 3   pipe
9050000   accul3   snglvol
9050101   0.0  21.  0.0239  0.0   20.0   10.005   1.0-4   0.0
00
9050200   3  4.23739e+06  2.90000e+02
*
*   accumulator no 2 valve
9060000   accv12   valve
* zeta kolena je 0.2 upostevamo 4 kolena od 8
9060101   905010000  956000000  0.00114  0.80  0.80  100000
9060201   0  0.00000e+00  0.00000e+00  0.00000e+00
*9060300  mtrvlv
*9060301  659   658   5.0   0.0
9060300  trpvlv
9060301  659
*
*
*   lpis pump no 2
8070000   lpis2   tmdpjun
8070101   804000000  855010000  0.00599
8070200   1   0   cntrlvar  807
8070201    0.0       0.0   0.0   0.0
8070202   0.67787+5 1.88941  0.0   0.0
8070203   1.5411+5  1.78996  0.0   0.0
8070204   3.8507+5  1.49164  0.0   0.0
8070205   6.767+5   0.99442  0.0   0.0
8070206   8.517+5   0.49721  0.0   0.0
8070207   9.077+5   0.09944  0.0   0.0
8070208   9.100+5   0.0      0.0   0.0
*
*   hpis tank no 2 - rwst2
8040000   rwst2   tmdpvol
8040101   0.0   6.1  28.32  0.0  90.0   6.1     1.0-4  0.0   0
8040200   013
8040201   0.0   1.02+5   307.  0.0
*
*
*   lpis pump no 3
9070000   lpis3   tmdpjun
9070101   904000000  955010000  0.00599
9070200   1   0   cntrlvar  907
9070201    0.0       0.0   0.0   0.0
9070202   0.67787+5 1.88941  0.0   0.0
9070203   1.5411+5  1.78996  0.0   0.0
9070204   3.8507+5  1.49164  0.0   0.0
9070205   6.767+5   0.99442  0.0   0.0
9070206   8.517+5   0.49721  0.0   0.0
9070207   9.077+5   0.09944  0.0   0.0
9070208   9.100+5   0.0      0.0   0.0
*
*   hpis tank no 3 - rwst3
9040000   rwst3   tmdpvol
9040101   0.0   6.1  28.32  0.0  90.0   6.1     1.0-4  0.0   0
9040200   013
9040201   0.0   1.02+5   307.  0.0
*
*
* filter: crpalka ne dela sunkovito.
* razmerje faktorjev 0.3+0.7+1.0 je lahko drugacno.
*
* ctv 907: cold leg - rwst delta pressure (filtered)
20590700  clrwstd3  sum  1.0  151.0+5  0
20590701  0.0  -0.3 p 904010000  0.3 p 955010000  0.7 cntrlvar
907
*
* ctv 807: cold leg - rwst delta pressure (filtered)
20580700  clrwstd2  sum  1.0  151.0+5  0
20580701  0.0  -0.3 p 804010000  0.3 p 855010000  0.7 cntrlvar
807
*
*
*****************************************************************
*********
* aaffwv          pomozno napajanje in steam dump
*
*****************************************************************
*********
*
* cv 320 : dp1r2  dp sgl nr level [pa]
*  0.0197 = 1/9.8067
20532000  dp1r2  sum  1.0  0.0  1
20532001  0.0  0.10197 p   308010000 -0.10197 p   310010000
20532002        0.121   rho 308010000  0.440   rho 310010000
*
* cv 321 : zt1r2 narrow range sgl level [m]
20532100   zt3r2  div  1.0  0.0  1
20532101   rho 308010000  cntrlvar 320
*
* cv 322 : ztsgl wide range sgl level [m]
20532200  ztsgl  sum  1.0  0.0  1
20532201  11.255   1.0  cntrlvar 321  *++
*
*   afw pump no 1          - ultimate procedure
3700000   afw1i
3700101   368000000   332000000  0.0006786
3700200   1  626   cntrlvar  322
3700201    -1.0      0.0       0.0   0.0
3700202     0.0      0.30329   0.0   0.0
3700203     13.32    0.30329   0.0   0.0
3700204     13.4     0.24263   0.0   0.0
3700205     13.5     0.16726   0.0   0.0
3700206     13.6     0.09169   0.0   0.0
3700207     13.7     0.01611   0.0   0.0
3700208     13.71    0.00855   0.0   0.0
3700209     13.715   0.00477   0.0   0.0
3700210     13.72    0.0       0.0   0.0
*
*   afw pump no 1, after ultimate procedure
3710000   afw1ii   tmdpjun
3710101   369000000  332000000  0.0006786
3710200   1  526   cntrlvar  322
3710201    -1.0      0.0       0.0   0.0
3710202     0.0      0.30329   0.0   0.0
3710203     13.14    0.30329   0.0   0.0
3710204     13.20    0.24263   0.0   0.0
3710205     13.25    0.16726   0.0   0.0
3710206     13.30    0.09169   0.0   0.0
3710207     13.325   0.01611   0.0   0.0
3710208     13.34    0.00855   0.0   0.0
3710209     13.35    0.00477   0.0   0.0
*
*   steam dump no 1, after ultimate procedure
3720000   sdump1   tmdpjun
3720101   320010000   367000000  0.00216475
3720200   1  526   p 310020000
3720201    -1.0     0.0     0.0   0.0
3720202    -0.5     0.0     0.0   0.0
3720203     0.0     0.0     0.0   0.0
3720204     1.+5    0.0078  0.0   0.0
3720205     70.+5   0.546   0.0   0.0
3720206   100.+5    0.78    0.0   0.0
*
*   steam dump no 1
3670000   sdump1   tmdpvol
3670101   0.0   6.1  28.32  0.0  90.0   6.1     1.0-4  0.0   0
3670200   003
3670201   0.0   1.02+5   507.
*
*   afw tank-i no 1
3680000   afwt1i   tmdpvol
3680101   0.0   6.1  28.32  0.0  90.0   6.1     1.0-4  0.0   0
3680200   003
3680201   0.0   1.02+5   307.
*
*   afw tank-ii no 1
3690000   afwt1ii   tmdpvol
3690101   0.0   6.1  28.32  0.0  90.0   6.1     1.0-4  0.0   0
3690200   003
3690201   0.0   1.02+5   307.
*
*****************************************************************
*********
```

```
*
* cv 420 : dp2r2  dp sg2 nr level [pa]
*  0.0197 = 1/9.8067
20542000  dp2r2  sum  1.0  0.0  1
20542001  0.0  0.10197 p   408010000 -0.10197 p   410010000
20542002        0.121   rho 408010000  0.440   rho 410010000
*
* cv 421 : zt2r2 narrow range sg2 level [m]
20542100   zt2r2  div  1.0  0.0  1
20542101   rho 408010000  cntrlvar 420
*
* cv 422 : ztsg2 wide range sg2 level [m]
20542200  ztsg2  sum  1.0  0.0  1
20542201  11.255   1.0  cntrlvar 421  *++
*
*   afw pump no 2, before ultimate procedure
4700000   afw2i   tmdpjun
4700101   468000000  432000000  0.0006786
4700200   1  626   cntrlvar  422
4700201    -1.0      0.0         0.0   0.0
4700202     0.0      0.30329     0.0   0.0
4700203     13.32    0.30329     0.0   0.0
4700204     13.4     0.24263     0.0   0.0
4700205     13.5     0.16726     0.0   0.0
4700206     13.6     0.09169     0.0   0.0
4700207     13.7     0.01611     0.0   0.0
4700208     13.71    0.00855     0.0   0.0
4700209     13.715   0.00477     0.0   0.0
4700210     13.72    0.0         0.0   0.0
*
*   afw pump no 2, after ultimate procedure
4710000   afw2ii   tmdpjun
4710101   469000000  432000000  0.0006786
4710200   1  526   cntrlvar  422
4710201    -1.0      0.0         0.0   0.0
4710202     0.0      0.30329     0.0   0.0
4710203     13.14    0.30329     0.0   0.0
4710204     13.20    0.24263     0.0   0.0
4710205     13.25    0.16726     0.0   0.0
4710206     13.30    0.09169     0.0   0.0
4710207     13.325   0.01611     0.0   0.0
4710208     13.34    0.00855     0.0   0.0
4710209     13.35    0.00477     0.0   0.0
*
*   steam dump no 2, after ultimate procedure
4720000   sdump2   tmdpjun
4720101   420010000   467000000  0.00216475
4720200   1  526    p 410020000
4720201    -1.0      0.0     0.0   0.0
4720202    -0.5      0.0     0.0   0.0
4720203     0.0      0.0     0.0   0.0
4720204     1.+5     0.0078  0.0   0.0
4720205    70.+5     0.546   0.0   0.0
4720206   100.+5     0.78    0.0   0.0
*
*   steam dump no 2
4670000   sdump2   tmdpvol
4670101   0.0   6.1  28.32  0.0  90.0   6.1     1.0-4  0.0   0
4670200   003
4670201   0.0   1 □2+5   507.
*
*   afw tank-i no 2
4680000   afwt2i   tmdpvol
4680101   0.0   6.1  28.32  0.0  90.0   6.1     1.0-4  0.0   0
4680200   003
4680201   0.0   1.02+5   307.
*
*   afw tank-ii no 2
4690000   afwt2ii   tmdpvol
4690101   0.0   6.1  28.32  0.0  90.0   6.1     1.0-4  0.0   0
4690200   003
4690201   0.0   1.02+5   307.
*
**********************************************************
*********
*
* cv 520 : dp3r2  dp sg3 nr level [pa]
*  0.0197 = 1/9.8067
20552000  dp3r2  sum  1.0  0.0  1
20552001  0.0  0.10197 p   508010000 -0.10197 p   510010000
20552002        0.121   rho 508010000  0.440   rho 510010000
*
* cv 521 : zt3r2 narrow range sg3 level [m]
20552100   zt3r2  div  1.0  0.0  1
20552101   rho 508010000  cntrlvar 520
*
* cv 522 : ztsg3 wide range sg3 level [m]
20552200  ztsg3  sum  1.0  0.0  1
20552201  11.255   1.0  cntrlvar 521  *++
*
*   afw pump no 3, before ultimate procedure
5700000   afw3i   tmdpjun
5700101   568000000  532000000  0.0006786
5700200   1  626   cntrlvar  522
5700201     1.0      0.0         0.0   0.0
5700202     0.0      0.30329     0.0   0.0
5700203     13.32    0.30329     0.0   0.0
5700204     13.4     0.24263     0.0   0.0
5700205     13.5     0.16726     0.0   0.0
5700206     13.6     0.09169     0.0   0.0
5700207     13.7     0.01611     0.0   0.0
5700208     13.71    0.00855     0.0   0.0
5700209     13.715   0.00477     0.0   0.0
5700210     13.72    0.0         0.0   0.0
*
*   afw pump no 3, after ultimate procedure
5710000   afw3ii   tmdpjun
5710101   569000000  532000000  0.0006786
5710200   1  526   cntrlvar  522
5710201    -1.0      0.0         0.0   0.0
5710202     0.0      0.30329     0.0   0.0
5710203     13.14    0.30329     0.0   0.0
5710204     13.20    0.24263     0.0   0.0
5710205     13.25    0.16726     0.0   0.0
5710206     13.30    0.09169     0.0   0.0
5710207     13.325   0.01611     0.0   0.0
5710208     13.34    0.00855     0.0   0.0
5710209     13.35    0.00477     0.0   0.0
*
*   steam dump no 3, after ultimate procedure
5720000   sdump3    tmdpjun
5720101   520010000   567000000  0.00216475
5720200   1  526    p 510020000
5720201    -1.0      0.0     0.0   0.0
5720202    -0.5      0.0     0.0   0.0
5720203     0.0      0.0     0.0   0.0
5720204     1.+5     0.0078  0.0   0.0
5720205    70.+5     0.546   0.0   0.0
5720206   100.+5     0.78    0.0   0.0
*
*   steam dump no 3
5670000   sdump3   tmdpvol
5670101   0.0   6.1  28.32  0.0  90.0   6.1     1.0-4  0.0   0
5670200   003
5670201   0.0   1.02+5   507.
*
*   afw tank-i no 3
5680000   afwt3i   tmdpvol
5680101   0.0   6.1  28.32  0.0  90.0   6.1     1.0-4  0.0   0
5680200   003
5680201   0.0   1.02+5   307.
*
*   afw tank-ii no 3
5690000   afwt3ii   tmdpv.
5690101   0.0   6.1  28      0.0  90.0   6.1     1.0-4  0.0   0
5690200   003
5690201   0.0   1.02+5     .7.
*
*
**********************************************************
*********
* zz11                        zlom : cl1
*
**********************************************************
*********
*
*
1800000  break  sngljun
1800101  655010000  182000000  2.09117e-05  4.  4.  130102
0.92  0.92
1800110  .00516  0.0  1.0  1.0
1800201   0 -5.43513e-07 -5.43513e-07  0.00000e+00
*
1820000  bline  snglvol
1820101  1.6619-3  10.0  0.0  0.0  0.0  0.0  1.0e-04  0.0  00
1820200   3  1.58753e+07  5.33112e+02
*
1830000  bvent  valve
1830101  182010000  186000000  1.65e-03  0.0  0.0  100100
1830201   0  0.00000e+00  0.00000e+00  0.00000e+00
1830300  mtrvlv
1830301  501  603  20.  0.0
*
1860000  tank  tmdpvol
1860101  1.0  0.0   5.02   0.0  0.0  0.0  1.0e-04  0.0  00
1860200  2
1860201  0.0  1.0e+05  1.0
*
*
**********************************************************
*********
* ccvvhh11                toplotne izgube
*
**********************************************************
*********
*
*++  t okolice = 25 c
*
* cv 220: lower plenum heat losses
20522000  lphl  function  1.0  0.0  1  3  -4900.0  0.0
20522001  tempf  123010000  220
*
20222000  reac-t  670
20222001   -1.0       0.0
20222002  298.0       0.0
20222003  560.0   -4900.0
*
*
```

```
* cv 221: core bypass heat losses
20522100  cobyhl  function  1.0  0.0  1  3  -4576.0  0.0
20522101  tempf  133010000  221
*
20222100  reac-t  670
20222101   -1.0       0.0
20222102  298.0       0.0
20222103  560.0  -4576.0
*
*
* cv 222: upper plenum + upper head heat losses
20522200  uphhl  function  1.0  0.0  1  3  -6292.0  0.0
20522201  tempf  153010000  222
*
20222200  reac-t  670
20222201   -1.0       0.0
20222202  298.0       0.0
20222203  560.0  -6292.0
*
*
* cv 223: reactor downcomer heat losses
20522300  dwnhl  function  1.0  0.0  1  3  -6032.0  0.0
20522301  tempf  119040000  223
*
20222300  reac-t  670
20222301   -1.0       0.0
20222302  298.0       0.0
20222303  560.0  -6032.0
*
*
* cv 224: cold leg 1 heat losses
20522400  cl1hl  function  1.0  0.0  1  3  -5356.0  0.0
20522401  tempf  653010000  224
*
20222400  reac-t  670
20222401   -1.0       0.0
20222402  298.0       0.0
20222403  560.0  -5356.0
*
*
* cv 225: steam generator 1 heat losses
20522500  sg1hl  function  1.0  0.0  1  3  -18096.0  0.0
20522501  tempf  303020000  225
*
20222500  reac-t  670
20222501   -1.0       0.0
20222502  298.0       0.0
20222503  555.0  -18096.0
*
*
* cv 226: hot leg 1 heat losses
20522600  hl1hl  function  1.0  0.0  1  3  -2704.0  0.0
20522601  tempf  656010000  225
*
20222600  reac-t  670
20222601   -1.0       0.0
20222602  298.0       0.0
20222603  564.0  -2704.0
*
*
* cv 227: cold leg 2 heat losses
20522700  cl2hl  function  1.0  0.0  1  3  -5356.0  0.0
20522701  tempf  853010000  224
*
* cv 228: steam generator 2 heat losses
20522800  sg2hl  function  1.0  0.0  1  3  -18096.0  0.0
20522801  tempf  403020000  225
*
* cv 229: hot leg 2 heat losses
20522900  hl2hl  function  1.0  0.0  1  3  -2704.0  0.0
20522901  tempf  856010000  226
*
* cv 230: cold leg 3 heat losses
20523000  cl3hl  function  1.0  0.0  1  3  -5356.0  0.0
20523001  tempf  953010000  224
*
* cv 231: steam generator 3 heat losses
20523100  sg3hl  function  1.0  0.0  1  3  -18096.0  0.0
20523101  tempf  503020000  225
*
* cv 232: hot leg 3 heat losses
20523200  hl3hl  function  1.0  0.0  1  3  -2704.0  0.0
20523201  tempf  956010000  226
*
*
* cv 233: surge line heat losses
20523300  slhl  function  1.0  0.0  1  3  -3560.0  0.0
20523301  tempf  215010000  233
*
20223300  reac-t  670
20223301   -1.0       0.0
20223302  298.0       0.0
20223303  568.0  -3560.0
*
*
* cv 234: pressurizer heat losses
20523400  przhl  function  1.0  0.0  1  3  -4000.0  0.0
20523401  tempf  203020000  234
*
20223400  reac-t  670
20223401   -1.0       0.0
20223402  298.0       0.0
20223403  618.0  -4000.0
*
*
* cv 235: system heat losses
20523500  sumhl  sum  1.0  0.0  1
20523501  0.0  1.0 cntrlvar 220  1.0 cntrlvar 221  1.0 cntrlvar
222
20523502       1.0 cntrlvar 223  1.0 cntrlvar 224  1.0 cntrlvar
225
20523503       1.0 cntrlvar 226  1.0 cntrlvar 227  1.0 cntrlvar
228
20523504       1.0 cntrlvar 229  1.0 cntrlvar 230  1.0 cntrlvar
231
20523505       1.0 cntrlvar 232  1.0 cntrlvar 233  1.0 cntrlvar
234
20523506       3.0 cntrlvar 701
*
*
************************************************************
*********
*
*
* hhas          heat structure thermal property data
*
*
*
************************************************************
*********
*
* composition type and data format
*
20100100 tbl/fctn  1  -1  * stainless steel
20100200 tbl/fctn  2   2  * boron nitride (heater rods)
20100300 tbl/fctn  1  -1  * inconel 600
*
* thermal conductivity data
*
* stainless steel
20100101  293. 13.9, 373. 15.1, 473. 16.7, 573. 18.3, 673.
19.8, 873. 23.0,
20100102 1073. 26.1
* boron nitride
*! 20100201  473. 1073. 2. 0. 0. 0. 0. 0. 0.
20100201  293. 1073. 2. 0. 0. 0. 0. 0. 0.
* inconel 600
20100301  293. 14.9, 373. 15.6, 473. 17.2, 673. 20.4, 873.
23.7, 1073. 27.4
*
* volumetric heat capacity data
*
* stainless steel
20100151  3.57870+6, 3.88778+6, 4.09768+6, 4.20898+6,
4.26474+6, 4.41405+6,
20100152  4.65555+6
* boron nitride
*! 20100251  473. 1073. 1.46+6 1.62+3 0. 0. 0. 0. 0.
20100251  293. 1073. 1.46+6 1.62+3 0. 0. 0. 0. 0.
* inconel 600
20100351  3.76320+6, 3.85526+6, 4.02919+6, 4.26422+6,
4.68003+6, 4.98467+6
*
************************************************************
*********
*
* comparison report dodatki
*
20516000  avgrhof  sum  0.0833  0.0  1
20516001  0.0  1.0 rhof 131010000  1.0 rhof 131020000  1.0 rhof
131030000
20516002       1.0 rhof 131040000  1.0 rhof 131050000  1.0 rhof
131060000
20516003       1.0 rhof 131070000  1.0 rhof 131080000  1.0 rhof
131090000
20516004       1.0 rhof 131100000  1.0 rhof 131110000  1.0 rhof
131120000
*
20516100  clev1  sum  1.0  0.0  1   * 101.94 = 1000*1/9.81
[kPA-->pA]
20516101  0.0  101.94  cntrlvar 240  -5.81  rhog 131060000
*
20516200  clev2  sum  1.0  0.01  1
20516201  0.0  1.0  cntrlvar 160  -1.0  rhog 131060000
*
* ctv 163: collapsed liquid core level (m)
20516300  corelev1  div  1.0  0.1  3  0.0  9.5
20516301  cntrlvar 162  cntrlvar 161
*
************************************************************
*********
*
* ctv 146: maximum httemp rx core, right-wall surface
20514600  maxrxt   stdfnctn  1.0  600.  1
20514601  max  httemp  131000106  httemp 131000206
20514602       httemp  131000306  httemp 131000406
20514603       httemp  131000506  httemp 131000606
20514604       httemp  131000706  httemp 131000806
```

```
20514605       httemp  131000806  httemp 131001006
20514606       httemp  131000906  httemp 131001206
*
* zacetno stanje: mcp(0) + msm2(0) + msm3(0)
*                 1949 KG + 286 KG  + 286 KG  =  2521 KG
20517000  mcp  sum  1.0  1949.0  0
20517001  2521.0  -1.0 cntrlvar 271  -1.0 cntrlvar 275
20517002          -1.0 cntrlvar 276  +1.0 cntrlvar 274
*
*****************************************************************
*********
*
  ****  end ****
```

Appendix A - Listing of the middle BETSY nodalization - restart input

```
* bethsy - bethm11b1.dat restart (100 - 8630.0 sec)
*                comparison report zahteva dodatne cv
*
*
*   spuscena spodnja meja s. lastnosti za borov nitrid
*
* v post-test preracunu (november 91 -->):
*   odprava separatorjev
*   abrupt-normal zlom
*   razsirjena tabela top1 prev. za material 1 (brez
ekstrapolacije)
*
* koncni spoj-zlom iz btestm1n2.dat (junij 1993)
* niso upostevane tudi nbam31.dat spremembe (se imamo npr
mtrvlv 183)
*
* zlom v 300. sekundi
*
* ++ opozorilo !
*
100  restart transnt
103  8000
*
201   1450.0  1.0-6  0.02   3  500   25000  25000
202   1700.0  1.0-6  0.005  3 2000   40000  40000
203   8630.0  1.0-6  0.02   3  500   25000  25000
* 202   2800.0  1.0-6  0.04   3  500   25000  25000
* 202   1400.0  1.0-6  0.04   3  500   25000  25000
*
*
*****************************************************************
***********
** mnee                    requested minor edit
*
*****************************************************************
***********
**
*301  voidg      603010000  * albc1: hl1 spool piece void
fraction [ ]
*302  voidg      656010000  * albf1: cl1 spool piece void
fraction [ ]
*303  voidg      803010000  * albc2: hl2 spool piece void
fraction [ ]
*304  voidg      856010000  * albf2: cl2 spool piece void
fraction [ ]
*305  voidg      903010000  * albc3: hl3 spool piece void
fraction [ ]
*306  voidg      956010000  * albf3: cl3 spool piece void
fraction [ ]
**
**++  dp = p(low press. tap) - p(high press. tap)
**
*307  cntrlvar  240         * dp0200   : core heat. length diff.
press. [kpa]
*308  cntrlvar  241         * dpupl    : upper plenum diff.
press. [kpa]
*309  cntrlvar  242         * dp034    : guide tube dif. press.
[kpa]
*310  cntrlvar  243         * dpuhead  : upper head dif. press.
[kpa]
*311  cntrlvar  244         * dp050    : downcommer to upp. head
dif. p. [kpa]
*312  cntrlvar  245         * dp0r1    : pressure vessel dif.
press. [kpa]
**
*313  cntrlvar  246         * dp1      : cl1 to hl1 diff. press.
[kpa]
*314  cntrlvar  247         * dp12pg   : pump 1 diff. press.
[kpa]
*315  cntrlvar  248         * dp12vg   : loop seal 1 downf. side
diff. p. [kpa]
*316  cntrlvar  249         * dp12vp   : loop seal 1 upflow.
side diff. p. [kpa]
**
*317  cntrlvar  250         * dp2      : cl2 to hl2 diff. press.
[kpa]
*318  cntrlvar  251         * dp22pg   : pump 2 diff. press.
[kpa]
*319  cntrlvar  252         * dp22vg   : loop seal 2 downf. side
diff. p. [kpa]
*320  cntrlvar  253         * dp22vp   : loop seal 2 upflow.
side diff. p. [kpa]
**
*321  cntrlvar  254         * dp3      : cl3 to hl3 diff. press.
[kpa]
*322  cntrlvar  255         * dp32pg   : pump 3 diff. press.
[kpa]
*323  cntrlvar  256         * dp32vg   : loop seal 3 downf. side
diff. p. [kpa]
*324  cntrlvar  257         * dp32vp   : loop seal 3 upflow.
side diff. p. [kpa]
**
*325  cntrlvar  258         * dp4      : sg1 u-tube in. to
outlet diff. p. [kpa]
*326  cntrlvar  259         * dp41     : sg1 inlet plenum diff.
press. [kpa]
*327  cntrlvar  260         * dp426    : sg1 u-tube upflow side
diff. p. [kpa]
*328  cntrlvar  261         * dp4r2    : sg1 boiler section
diff. press. [kpa]
**
*329  cntrlvar  262         * dp5      : sg2 u-tube in. to
outlet diff. p. [kpa]
*330  cntrlvar  263         * dp51     : sg2 inlet plenum diff.
press. [kpa]
*331  cntrlvar  264         * dp526    : sg2 u-tube upflow side
diff. p. [kpa]
*332  cntrlvar  265         * dp5r2    : sg2 boiler section
diff. press. [kpa]
**
*333  cntrlvar  266         * dp6      : sg3 u-tube in. to
outlet diff. p. [kpa]
*334  cntrlvar  267         * dp61     : sg3 inlet plenum diff.
press. [kpa]
*335  cntrlvar  268         * dp626    : sg3 u-tube upflow side
diff. p. [kpa]
*336  cntrlvar  269         * dp6r2    : sg3 boiler section
diff. press. [kpa]
**
*337  cntrlvar  270         * dpp1     : pressurizer diff.
press. [kpa] *++
**
*338  cntrlvar  271         * intqmb   : time integrated break
mass flow [kg]
*339  cntrlvar  274         * intqmsi  : time integrated lpsi
mass flow [kg]
*340  cntrlvar  305         * mgv1     : sg1 secondary side mass
invet. [kg]
*341  cntrlvar  405         * mgv2     : sg2 secondary side mass
invet. [kg]
*342  cntrlvar  505         * mgv3     : sg3 secondary side mass
invet. [kg]
*343  cntrlvar  275         * msm2     : accumulator 2 mass
invetory [kg]
*344  cntrlvar  276         * msm3     : accumulator 3 mass
invetory [kg]
**
*345  cntrlvar  277         * p+47     : sg1 steam dome pressure
[mpa]
*346  cntrlvar  278         * p+57     : sg2 steam dome pressure
[mpa]
*347  cntrlvar  279         * p+67     : sg3 steam dome pressure
[mpa]
*348  cntrlvar  280         * p+p      : pressurizer top
pressure [mpa]
*349  cntrlvar  281         * p+sm2    : accumulator 2 gas phase
pressure [mpa]
*350  cntrlvar  282         * p+sm3    : accumulator 3 gas phase
pressure [mpa]
**
*351  mflowj    123010000  * qm05     : downcomer mass flow
rate [kg/s]
*352  mflowj    332010000  * qman31   : sg1 feedwater mass flow
rate [kg/s]
*353  mflowj    432010000  * qman32   : sg2 feedwater mass flow
rate [kg/s]
*354  mflowj    532010000  * qman33   : sg3 feedwater mass flow
rate [kg/s]
*355  mflowj    180000000  * qmb      : break mass flow rate
[kg/s]
*356  mflowj    311000000  * qmgv11   : sg1 steam line mass
flow rate [kg/s]
*357  mflowj    411000000  * qmgv12   : sg2 steam line mass
flow rate [kg/s]
*358  mflowj    511000000  * qmgv13   : sg3 steam line mass
flow rate [kg/s]
*359  mflowj    807000000  * qmsb12   : lpsi in cl2 mass flow
rate [kg/s]
*360  mflowj    907000000  * qmsb13   : lpsi in cl3 mass flow
rate [kg/s]
**
*361  cntrlvar  283         * sebreak  : break specific enthalpy
[kj/kg]
**
*362  tempf     123010000  * tf012a   : core inlet temperature
[k]
*363  tempf     141010000  * tf0304   : core outlet temperature
[k]
*364  tempf     151010000  * tf041    : upper head (bottom)
temperature [k]
*365  tempf     153010000  * tf042    : upper head (top)
temperature [k]
*366  tempf     602010000  * tf112    : hot leg 1 temperature
[k]
```

```
*367  tempf     655010000  * tf133    : cold leg 1 temperature
[k]
*368  tempf     802010000  * tf212    : hot leg 2 temperature
[k]
*369  tempf     855010000  * tf233    : cold leg 2 temperature
[k]
*370  tempf     902010000  * tf312    : hot leg 3 temperature
[k]
*371  tempf     955010000  * tf333    : cold leg 3 temperature
[k]
*372  tempf     309050000  * tf454c   : bottom of sg1 downcomer
temperature [k]
*373  tempf     409050000  * tf554c   : bottom of sg2 downcomer
temperature [k]
*374  tempf     509050000  * tf654c   : bottom of sg3 downcomer
temperature [k]
**
*375  httemp    131000701  * ts02091 :
*376  httemp    131000801  * ts02151 :
*377  httemp    131000901  * ts02191 : rod temperature from
middle to
*378  httemp    131001001  * ts02201 : top core elevation [k]
*379  httemp    131001101  * ts02241 : *** ts = ? (le omemba v
tab.1 str.28/87)
*380  httemp    131001201  * ts02281 :
*381  cntrlvar  146        * tmax    : max. clad temperature
[k]
**
*382  cntrlvar  286        * vp1     : pump 1 rotation speed
[rpm]
*383  cntrlvar  287        * vp2     : pump 2 rotation speed
[rpm]
*384  cntrlvar  288        * vp3     : pump 3 rotation speed
[rpm]
**
*385  cntrlvar  289        * w+02    : core (electrical) power
[kw]
*386  cntrlvar  290        * w+trac  : trace heating [kw]
**
*387  cntrlvar  110        * zt0200  : core level [m]
*388  cntrlvar  291        * zscore  : swollen level [m]
***
**
*389  dt         0         * dtcalc  : time step along
transient [s]
*390  emass      0         * mer     : mass error [kg]
**
*****************************************************************
***********
**
** dodatni "kontrolni" izpis:
**
*391  cntrlvar  111        * reactor vessel level [m]
*392  cntrlvar  203        * prz level [m]
*393  cntrlvar  303        * sg 1 downcomer level [m]
*394  cntrlvar  403        * sg 2 downcomer level [m]
*395  cntrlvar  503        * sg 3 downcomer level [m]
*396  cntrlvar  235        * heat losses [w]
*397  cntrlvar  283        * sebreak : break specific enthalpy
[kj/kg]
*398  cntrlvar  295        * sebreak : break specific enthalpy
[kj/kg]
**
*
*****************************************************************
**********
```

```
*
* comparison report variables request
*
301  cntrlvar  280        * p+p     : PRESSURIZER TOP PRESSURE
[mpA]
302  cntrlvar  278        * p+57    : sg2 STEAM DOME PRESSURE
[mpA]
303  cntrlvar  163        * zt0200  : COR  COLLAPSED LIQUID
LEVEL [M]
304  tempg     131120000  * tf03046 : CO  E OUTLET STEAM
TEMPERATURE [k]
305  cntrlvar  146        * tmax    : MA.  CLAD WALL
TEMPERATURE [k]
306  voidg     656070000  * albf1   : .11 SPOOL PIECE VOID
FRACTION [ ] R+
307  mflowj    180000000  * qmb     : BREAK MASS FLOW RATE
[KG/S]
308  cntrlvar  405        * mgv2    : sg2 SECONDARY SIDE MASS
INVET. [KG]
309  cntrlvar  170        * mcp     : PRIMARY MASS INVENTORY
[KG]
*
310  cntrlvar  271        * intqmb  : BREAK DISCHARGED MASS
[KG]
*
313  cntrlvar  110        * zt0200  : SIMPL. CORE COLLAPSED
LIQUID LEVEL [M]
*
*****************************************************************
**********
*
317  cntrlvar  240        * dp0200  : CORE HEAT. LENGTH DIFF.
PRESS. [KpA]
318  cntrlvar  241        * dpupl   : UPPER PLENUM DIFF.
PRESS. [KpA]
319  cntrlvar  242        * dp034   : GUIDE TUBE DIF. PRESS.
[KpA]
320  cntrlvar  243        * dpuhead : UPPER HEAD DIF. PRESS.
[KpA]
321  cntrlvar  244        * dp050   : DOWNCOMMER TO UPP. HEAD
DIF. P. [KpA]
322  cntrlvar  245        * dp0r1   : PRESSURE VRSS    P.
PRESS. [KpA]
*
323  cntrlvar  246        * dp1     : c11 TO h11 DIFF. PRESS.
[KpA]
324  cntrlvar  247        * dp12pg  : pump 1 DIFF. PRESS.
[KpA]
325  cntrlvar  248        * dp12vg  : LOOP SEAL 1 DOWNP. SIDE
DIFF. P. [KpA]
326  cntrlvar  249        * dp12vp  : LOOP SEAL 1 UPFLOW. SIDE
DIFF. P. [KpA]
*
327  cntrlvar  250        * dp2     : c12 TO h12 DIFF. PRESS.
[KpA]
328  cntrlvar  251        * dp22pg  : pump 2 DIFF. PRESS.
[KpA]
329  cntrlvar  252        * dp22vg  : LOOP SEAL 2 DOWNP. SIDE
DIFF. P. [KpA]
330  cntrlvar  253        * dp22vp  : LOOP SEAL 2 UPFLOW. SIDE
DIFF. P. [KpA]
*
331  cntrlvar  254        * dp3     : c13 TO h13 DIFF. PRESS.
[KpA]
332  cntrlvar  255        * dp32pg  : pump 3 DIFF. PRESS.
[KpA]
```

```
333  cntrlvar  256        * dp32vg  : LOOP SEAL 3 DOWNP. SIDE
DIFF. P. [KpA]
334  cntrlvar  257        * dp32vp  : LOOP SEAL 3 UPFLOW. SIDE
DIFF. P. [KpA]
*
335  cntrlvar  258        * dp4     : sg1 u-tUBE IN. TO OUTLET
DIFF. P. [KpA]
336  cntrlvar  259        * dp41    : sg1 INLET PLENUM DIFF.
PRESS. [KpA]
337  cntrlvar  260        * dp426   : sg1 u-tUBE UPFLOW SIDE
DIFF. P. [KpA]
338  cntrlvar  261        * dp4r2   : sg1 BOILER SECTION DIFF.
PRESS. [KpA]
*
339  cntrlvar  262        * dp5     : sg2 u-tUBE IN. TO OUTLET
DIFF. P. [KpA]
340  cntrlvar  263        * dp51    : sg2 INLET PLENUM DIFF.
PRESS. [KpA]
341  cntrlvar  264        * dp526   : sg2 u-tUBE UPFLOW SIDE
DIFF. P. [KpA]
342  cntrlvar  265        * dp5r2   : sg2 BOILER SECTION DIFF.
PRESS. [KpA]
*
343  cntrlvar  266        * dp6     : sg3 u-tUBE IN. TO OUTLET
DIFF. P. [KpA]
344  cntrlvar  267        * dp61    : sg3 INLET PLENUM DIFF.
PRESS. [KpA]
345  cntrlvar  268        * dp626   : sg3 u-tUBE UPFLOW SIDE
DIFF. P. [KpA]
346  cntrlvar  269        * dp6r2   : sg3 BOILER SECTION DIFF.
PRESS. [KpA]
*
347  cntrlvar  270        * dpp1    : PRESSURIZER DIFF. PRESS.
[KpA] ***
*
348  cntrlvar  271        * intqmb  : TIME INTEGRATED BREAK
MASS FLOW [KG]
349  cntrlvar  274        * intqmsi : TIME INTEGRATED lpsi
MASS FLOW [KG]
350  cntrlvar  305        * mgv1    : sg1 SECONDARY SIDE MASS
INVET. [KG]
351  cntrlvar  405        * mgv2    : sg2 SECONDARY SIDE MASS
INVET. [KG]
352  cntrlvar  505        * mgv3    : sg3 SECONDARY SIDE MASS
INVET. [KG]
353  cntrlvar  275        * msm2    : ACCUMULATOR 2 MASS
INVETORY [KG]
354  cntrlvar  276        * msm3    : ACCUMULATOR 3 MASS
INVETORY [KG]
*
355  cntrlvar  277        * p+47    : sg1 STEAM DOME PRESSURE
[mpA]
356  cntrlvar  278        * p+57    : sg2 STEAM DOME PRESSURE
[mpA]
357  cntrlvar  279        * p+67    : sg3 STEAM DOME PRESSURE
[mpA]
358  cntrlvar  280        * p+p     : PRESSURIZER TOP PRESSURE
[mpA]
359  cntrlvar  281        * p+sm2   : ACCUMULATOR 2 GAS PHASE
PRESSURE [mpA]
360  cntrlvar  282        * p+sm3   : ACCUMULATOR 3 GAS PHASE
PRESSURE [mpA]
*
361  mflowj    123010000  * qm05    : DOWNCOMER MASS FLOW RATE
[KG/S]
```

```
362  mflowj    332010000  * qman31   : sg1 FEEDWATER MASS FLOW
RATE [KG/S]
363  mflowj    432010000  * qman32   : sg2 FEEDWATER MASS FLOW
RATE [KG/S]
364  mflowj    532010000  * qman33   : sg3 FEEDWATER MASS FLOW
RATE [KG/S]
365  mflowj    180000000  * qmb      : BREAK MASS FLOW RATE
[KG/S]
366  mflowj    311000000  * qmgv11   : sg1 STEAM LINE MASS FLOW
RATE [KG/S]
367  mflowj    411000000  * qmgv12   : sg2 STEAM LINE MASS FLOW
RATE [KG/S]
368  mflowj    511000000  * qmgv13   : sg3 STEAM LINE MASS FLOW
RATE [KG/S]
369  mflowj    807000000  * qmsb12   : lpsi IN cl2 MASS FLOW
RATE [KG/S]
370  mflowj    907000000  * qmsb13   : lpsi IN cl3 MASS FLOW
RATE [KG/S]
*
371  cntrlvar  283        * sebreak  : BREAK SPECIFIC ENTHALPY
[Kj/KG]
*
372  tempf     123010000  * tf012a   : CORE INLET TEMPERATURE
[k]
373  tempf     141010000  * tf0304   : CORE OUTLET TEMPERATURE
[k]
374  tempf     151010000  * tf041    : UPPER HEAD (BOTTOM)
TEMPERATURE [k]
375  tempf     153010000  * tf042    : UPPER HEAD (TOP)
TEMPERATURE [k]
376  tempf     602010000  * tf112    : HOT LEG 1 TEMPERATURE
[k]
377  tempf     655010000  * tf133    : COLD LEG 1 TEMPERATURE
[k]
378  tempf     802010000  * tf212    : HOT LEG 2 TEMPERATURE
[k]
379  tempf     855010000  * tf233    : COLD LEG 2 TEMPERATURE
[k]
380  tempf     902010000  * tf312    : HOT LEG 3 TEMPERATURE
[k]
381  tempf     955010000  * tf333    : COLD LEG 3 TEMPERATURE
[k]
382  tempf     309050000  * tf454c   : BOTTOM OF sg1 DOWNCOMER
TEMPERATURE [k]
383  tempf     409050000  * tf554c   : BOTTOM OF sg2 DOWNCOMER
TEMPERATURE [k]
384  tempf     509050000  * tf654c   : BOTTOM OF sg3 DOWNCOMER
TEMPERATURE [k]
*
385  httemp    131000701  * ts02091  :
386  httemp    131000801  * ts02151  :
387  httemp    131000901  * ts02191  : ROD TEMPERATURE FROM
MIDDLE TO
388  httemp    131001001  * ts02201  : TOP CORE ELEVATION [k]
389  httemp    131001101  * ts02241  : *++ ts = ? (LE OMEMBA V
TAB.1 STR.28/87)
390  httemp    131001201  * ts02281  :
391  cntrlvar  146        * tmax     : MAX. CLAD TEMPERATURE
[k]
*
392  cntrlvar  286        * vp1      : PUMP 1 ROTATION SPEED
[RPM]
393  cntrlvar  287        * vp2      : PUMP 2 ROTATION SPEED
[RPM]
394  cntrlvar  288        * vp3      : PUMP 3 ROTATION SPEED
[RPM]
*
395  cntrlvar  289        * w+02     : CORE (ELECTRICAL) POWER
[Kw]
396  cntrlvar  290        * w+trac   : TRACE HEATING [Kw]
*
397  cntrlvar  291        * zscore   : SWOLLEN LEVEL [M]
*++
*
398  dt        0          * dtcalc   : TIME STEP ALONG
TRANSIENT [S]
399  emass     0          * mer      : MASS ERROR [KG]
*
*
************************************************************
**********
* ttrr                        tripi
*
************************************************************
**********
*
501  time          0  gt  null      0   300.0      n   * break
*
604  -526  or  -526      n   * sg pressure control on - before
u. p.
*
*
************************************************************
**********
* ffii              fiksiranje zacetnega stanja
*
************************************************************
**********
*
*
20512600  noname  constant  0.648349    * rx flows
20515200  noname  constant  0.295703
*
20532400  noname  constant  2.8779e-02  * sg recirculation
20542400  noname  constant  2.9092e-02
20552400  noname  constant  2.9088e-02
*
20521800  noname  constant  0.0          * prz. heater
*
3290000  noname  delete                 * art. feedwate
3300000  noname  delete
4290000  noname  delete
4300000  noname  delete
5290000  noname  delete
5300000  noname  delete
*
7110000  noname  delete                 * art. pressurizer
7120000  noname  delete
2310000  noname  delete
2320000  noname  delete
*
*
************************************************************
**********
* llpp                l.p.s.i. in akumulatorji
*
************************************************************
**********
*
* trip 659 : trip ventil odpre akumulatorja 2 in 3
*
*
*  accumulator vessel2
8330000  accumu2  accum
8330101  0.0  8.358  0.423  0.0  90.0  8.358  3.96-5  0.0  00
8330200  41.8+5  290.  0.0
* zeta iztoka je 0.335, zeta kolena je 0.2, upostevamo 5 kolen
8331101  805000000  0.00114  1.335  1.335  000000
8332200  0.286  0.0  0.119  0.119  0.00927  0  0  0
*
*  accumulator no 2 pipe
8050000  accl2  snglvol
8050101  0.0  21.  0.0239  0.0  20.0  10.005  1.0-4  0.0  00
8050200  3  41.8+5  290.
*
*  accumulator no 2 valve
8060000  accv12  valve
* zeta kolena je 0.2, upostevamo 5 kolen od 10
8060101  805010000  856000000  0.00114  1.0  1.0  100000
8060201  0  0.00000e+00  0.00000e+00  0.00000e+00
8060300  trpvlv
8060301  659
*8060300  mtrvlv
*8060301  659  658  5.0  0.0
*
*
*  accumulator vessel3
9330000  accumu3  accum
9330101  0.0  8.358  0.423  0.0  90.0  8.358  3.96-5  0.0  00
9330200  41.8+5  290.  0.0
* zeta iztoka je 0.335, zeta kolena je 0.2, upostevamo 4
kolena
* kot accum. 833
9331101  905000000  0.00114  1.335  1.335  000000
9332200  0.286  0.0  0.119  0.119  0.00927  0  0  0
*
*  accumulator no 3  pipe
9050000  accl3  snglvol
9050101  0.0  21.  0.0239  0.0  20.0  10.005  1.0-4  0.0  00
9050200  3  41.8+5  290.
*
*  accumulator no 2 valve
9060000  accv12  valve
* zeta kolena je 0.2 upostevamo 4 kolena od 8
9060101  905010000  956000000  0.00114  0.80  0.80  100000
9060201  0  0.00000e+00  0.00000e+00  0.00000e+00
9060300  trpvlv
9060301  659
*9060300  mtrvlv
*9060301  659  658  5.0  0.0
*
*
************************************************************
**********
*
*  lpis pump no 2
8070000  lpis2   tmdpjun
8070101  804000000  855010000  0.00599  *++ presek
8070200  1  0  p 203080000
* ena qsb crpalka za obe cl veji (2+3)
8070201  0.0        0.0     0.0   0.0
8070202  0.6779+5   0.9447  0.0   0.0
8070203  1.5411+5   0.8950  0.0   0.0
8070204  3.8507+5   0.7458  0.0   0.0
8070205  6.767+5    0.4972  0.0   0.0
8070206  8.517+5    0.2486  0.0   0.0
8070207  9.077+5    0.0497  0.0   0.0
8070208  9.100+5    0.0     0.0   0.0
```

```
* ena qsb crpalka za vsako cl vejo (2,3)
* 8070202  0.6779+5  1.88941  0.0    0.0
* 8070203  1.5411+5  1.78996  0.0    0.0
* 8070204  3.8507+5  1.49164  0.0    0.0
* 8070205  6.767+5   0.99442  0.0    0.0
* 8070206  8.517+5   0.49721  0.0    0.0
* 8070207  9.077+5   0.09944  0.0    0.0
* 8070208  9.100+5   0.0      0.0    0.0
*
*  hpis tank no 2 - rwst2
8040000  rwst2   tmdpvol
8040101  0.0  6.1  28.32  0.0  90.0  6.1  1.0-4  0.0   0
8040200  3
8040201  0.0  1.02+5  307.0
*
*
*  lpis pump no 3
9070000  lpis3  tmdpjun
9070101  904000000  955010000  0.00599  *++ presek
9070200  1  0  p 203080000
9070201  0.0        0.0      0.0    0.0
9070202  0.6779+5   0.9447   0.0    0.0
9070203  1.5411+5   0.8950   0.0    0.0
9070204  3.8507+5   0.7458   0.0    0.0
9070205  6.767+5    0.4972   0.0    0.0
9070206  8.517+5    0.2486   0.0    0.0
9070207  9.077+5    0.0497   0.0    0.0
9070208  9.100+5    0.0      0.0    0.0
*
*  hpis tank no 3 - rwst3
9040000  rwst3  tmdpvol
9040101  0.0  6.1  28.32  0.0  90.0  6.1  1.0-4  0.0  0
9040200  3
9040201  0.0  1.02+5  307.0
*
*
*****************************************************************
**********
*                  regulacija tlaka pare: sg1
*
*****************************************************************
**********
*
3440000  kond1  tmdpvol
3440101  10.0  0.0  1000.0  0  0.0  0  0.2e-03  0  0
3440200  2  505   * si
3440201   -1.0  68.0571e+05  1.0     * before turbine bypass
(si) ++
3440202    0.0  68.0571e+05  1.0
3440203    4.0  69.2571e+05  1.0     * after turbine bypass: +
1.2 bar
*++        4.0 s ... dejansko tlak naraste v 3 s
*
3150000  vrgv11  valve
3150101  320010000  344000000  0.0  0.0  0.0  100000
3150201  0  6.99040e+00  6.95430e+00  0.00000e+00
3150300  trpvlv
3150301  604                          * after ultimate procedure
*
*
*  steam dump no. 1
3720000  sdump1  tmdpjun
3720101  320010000  367000000  0.00216475
3720200  1  526  p 310020000
3720201   -1.0    0.0   0.0     0.0
3720202   -0.5    0.0   0.0     0.0
3720203    0.0    0.0   0.0     0.0
3720204    1.+5   0.0   0.0078  0.0   * steam discharge
flowrate !
3720205   70.+5   0.0   0.5460  0.0
3720206  100.+5   0.0   0.7800  0.0
*
*++ ni upostevan zacetni odstopek tlaka: 68.7 bar - 68.4 bar =
0.3 bar
*   ---> napaka v masnem toku cca 0.00034 kg/s ... 0.5 % (pri 70
bar)
*
*++ pri prenosu na MOD3 se je zacetni odstopek povecal na 0.5
bar
*
*
*  steam dump no. 1
3670000  sdump1  tmdpvol
3670101  0.0  6.1  28.32  0.0  90.0  6.1  1.0-4  0.0  0
3670200  2
3670201  0.0  1.02+5  1.0
*
*
* fiksiranje prostih cv
20530000  noname  constant  1.0
20534400  noname  constant  1.0
*
*
*****************************************************************
**********
*                  regulacija tlaka pare: sg2
*
*****************************************************************
**********
*
4440000  kond2  tmdpvol
4440101  10.0  0.0  1000.0  0  0.0  0  0.2e-03  0  0
4440200  2  505   * si
4440201   -1.0  68.0613e+05  1.0     * before turbine bypass
(si) ++
4440202    0.0  68.0613e+05  1.0
4440203    4.0  69.2613e+05  1.0     * after turbine bypass: +
1.2 bar
*
4150000  vrgv12  valve
4150101  420010000  444000000  0.0  0.0  0.0  100000
4150201  0  6.99040e+00  6.95430e+00  0.00000e+00
4150300  trpvlv
4150301  604                          * after ultimate procedure
*
*
*  steam dump no. 2
4720000  sdump2  tmdpjun
4720101  420010000  467000000  0.00216475
4720200  1  526  p 410020000
4720201   -1.0    0.0   0.0     0.0
4720202   -0.5    0.0   0.0     0.0
4720203    0.0    0.0   0.0     0.0
4720204    1.+5   0.0   0.0078  0.0   * steam discharge
flowrate !
4720205   70.+5   0.0   0.5460  0.0
4720206  100.+5   0.0   0.7800  0.0
*
*  steam dump no. 2
4670000  sdump2  tmdpvol
4670101  0.0  6.1  28.32  0.0  90.0  6.1  1.0-4  0.0  0
4670200  2
4670201  0.0  1.02+5  1.0
*
*
20540000  noname  constant  1.0
20544400  noname  constant  1.0
*
*
*****************************************************************
**********
*                  regulacija tlaka pare: sg3
*
*****************************************************************
**********
*
5440000  kond3  tmdpvol
5440101  10.0  0.0  1000.0  0  0.0  0  0.2e-03  0  0
5440200  2  505   * si
5440201   -1.0  68.0614e+05  1.0     * before turbine bypass
(si) ++
5440202    0.0  68.0614e+05  1.0
5440203    4.0  69.2614e+05  1.0     * after turbine bypass: +
1.2 bar
*
5150000  vrgv13  valve
5150101  520010000  544000000  0.0  0.0  0.0  100000
5150201  0  6.99040e+00  6.95430e+00  0.00000e+00
5150300  trpvlv
5150301  604                          * after ultimate procedure
*
*
*  steam dump no. 3
5720000  sdump3  tmdpjun
5720101  520010000  567000000  0.00216475
5720200  1  526  p 510020000
5720201   -1.0    0.0   0.0     0.0
5720202   -0.5    0.0   0.0     0.0
5720203    0.0    0.0   0.0     0.0
5720204    1.+5   0.0   0.0078  0.0   * steam discharge
flowrate !
5720205   70.+5   0.0   0.5460  0.0
5720206  100.+5   0.0   0.7800  0.0
*
*  steam dump no. 3
5670000  sdump3  tmdpvol
5670101  0.0  6.1  28.32  0.0  90.0  6.1  1.0-4  0.0  0
5670200  2
5670201  0.0  1.02+5  1.0
*
*
20550000  noname  constant  1.0
20554400  noname  constant  1.0
*
*
*****************************************************************
**********
* aaffww                  pomozno napajanje
*
*****************************************************************
**********
*
* cv 320 - dp: sg1 nr level [pa/g]
* 0.0197 = 1/g = 1/9.8067
20532000  dp1r2  sum  1.0  0.0  1
20532001  0.0  0.10197 p   308010000   -0.10197 p   310010000
20532002       0.121   rho 308010000    0.440   rho 310010000
*
```

```
* cv 321 : narrow range sg1 level [m]
20532100  zt1r"  div  1.0  0.0  1
20532101  rho 3v8J10000  cntrlvar 320
*
* cv 322 : wide range sg1 level [m]
20532200  ztsg1  sum  1.0  0.0  1
20532201  11.255  1.0 cntrlvar 321
*
*
*  afw pump no. 1 - before ultimate procedure
3700000  afw1i  tmdpjun
3700101  368000000  332000000  0.0006786
3700200  1  626  cntrlvar  322
3700201  -1.0      0.0        0.0   0.0
3700202   0.0      0.30329    0.0   0.0
3700203   13.32    0.30329    0.0   0.0
* 3700204   13.4     0.24263    0.0   0.0
* 3700205   13.5     0.16726    0.0   0.0
* 3700206   13.6     0.09169    0.0   0.0
* 3700207   13.7     0.01611    0.0   0.0
* 3700208   13.71    0.00855    0.0   0.0
* 3700209   13.715   0.00477    0.0   0.0
3700210   13.72    0.0        0.0   0.0
*
*  afw pump no. 1 - after ultimate procedure
3710000  afw1ii   tmdpjun
3710101  369000000  332000000  0.0006786
3710200  1  526  cntrlvar  322
3710201  -1.0      0.0        0.0   0.0
3710202   0.0      0.30329    0.0   0.0
3710203   13.14    0.30329    0.0   0.0
* 3710204   13.20    0.24263    0.0   0.0
* 3710205   13.25    0.16726    0.0   0.0
* 3710206   13.30    0.09169    0.0   0.0
* 3710207   13.325   0.01611    0.0   0.0
* 3710208   13.34    0.00855    0.0   0.0
3710209   13.35    0.00477    0.0   0.0
*
*  afw tank-i no. 1
3680000  afwt1i   tmdpvol
3680101  0.0  6.1  28.32  0.0  90.0  6.1  1.0-4  0.0  0
3680200  003
3680201  0.0  1.02+5  307.0
*
*   afw tank-ii no. 1
3690000  afwt1ii  tmdpvol
3690101  0.0  6.1  28.32  0.0  90.0  6.1  1.0-4  0.0  0
3690200  003
3690201  0.0  1.02+5  307.0
*
************************************************************
**********
*
* cv 420 : dp sg2 nr level [pa/g]
* 0.0197 = 1/9.8067
20542000  dp2r2  sum  1.0  0.0  1
20542001  0.0  0.10197 p   408010000   -0.10197 p   410010000
20542002        0.121    rho 408010000    0.440    rho 410010000
*
* cv 421 : narrow range sg2 level [m]
20542100  zt2r2  div  1.0  0.0  1
20542101  rho 408010000  cntrlvar 420
*
* cv 422 : wide range sg2 level [m]
20542200  ztsg2  sum  1.0  0.0  1
20542201  11.255   1.0 cntrlvar 421
*
*
*  afw pump no. 2 - before ultimate procedure
4700000  afw2i  tmdpjun
4700101  468000000  432000000  0.0006786
4700200  1  626  cntrlvar  422
4700201  -1.0      0.0        0.0   0.0
4700202   0.0      0.30329    0.0   0.0
4700203   13.32    0.30329    0.0   0.0
* 4700204   13.4     0.24263    0.0   0.0
* 4700205   13.5     0.16726    0.0   0.0
* 4700206   13.6     0.09169    0.0   0.0
* 4700207   13.7     0.01611    0.0   0.0
* 4700208   13.71    0.00855    0.0   0.0
* 4700209   13.715   0.00477    0.0   0.0
4700210   13.72    0.0        0.0   0.0
*
*  afw pump no. 2 - after ultimate procedure
4710000  afw2ii  tmdpjun
4710101  469000000  432000000  0.0006786
4710200  1  526  cntrlvar  422
4710201  -1.0      0.0        0.0   0.0
4710202   0.0      0.30329    0.0   0.0
4710203   13.14    0.30329    0.0   0.0
* 4710204   13.20    0.24263    0.0   0.0
* 4710205   13.25    0.16726    0.0   0.0
* 4710206   13.30    0.09169    0.0   0.0
* 4710207   13.325   0.01611    0.0   0.0
* 4710208   13.34    0.00855    0.0   0.0
4710209   13.35    0.00477    0.0   0.0
*
*   afw tank-i no. 2
4680000  afwt2i  tmdpvol
4680101  0.0  6.1  28.32  0.0  90.0  6.1  1.0-4  0.0  0
4680200  003
4680201  0.0  1.02+5  307.0
*
*   afw tank-ii no. 2
4690000  afwt2ii  tmdpvol
4690101  0.0  6.1  28.32  0.0  90.0  6.1  1.0-4  0.0  0
4690200  003
4690201  0.0  1.02+5  307.0
*
************************************************************
**********
*
* cv 520 : dp sg3 nr level [pa/g]
* 0.0197 = 1/9.8067
20552000  dp3r2  sum  1.0  0.0  1
20552001  0.0  0.10197 p   508010000   -0.10197 p   510010000
20552002        0.121    rho 508010000    0.440    rho 510010000
*
* cv 521 : narrow range sg3 level [m]
20552100  zt3r2  div  1.0  0.0  1
20552101  rho 508010000  cntrlvar 520
*
* cv 522 : wide range sg3 level [m]
20552200  ztsg3  sum  1.0  0.0  1
20552201  11.255  1.0 cntrlvar 521
*
*
*  afw pump no. 3 - before ultimate procedure
5700000  afw3i  tmdpjun
5700101  568000000  532000000  0.0006786
5700200  1  626  cntrlvar  522
5700201  -1.0      0.0        0.0   0.0
5700202   0.0      0.30329    0.0   0.0
5700203   13.32    0.30329    0.0   0.0
* 5700204   13.4     0.24263    0.0   0.0
* 5700205   13.5     0.16726    0.0   0.0
* 5700206   13.6     0.09169    0.0   0.0
* 5700207   13.7     0.01611    0.0   0.0
* 5700208   13.71    0.00855    0.0   0.0
* 5700209   13.715   0.00477    0.0   0.0
5700210   13.72    0.0        0.0   0.0
*
*  afw pump no. 3 - after ultimate procedure
5710000  afw3ii  tmdpjun
5710101  569000000  532000000  0.0006786
5710200  1  526  cntrlvar  522
5710201  -1.0      0.0        0.0   0.0
5710202   0.0      0.30329    0.0   0.0
5710203   13.14    0.30329    0.0   0.0
* 5710204   13.20    0.24263    0.0   0.0
* 5710205   13.25    0.16726    0.0   0.0
* 5710206   13.30    0.09169    0.0   0.0
* 5710207   13.325   0.01611    0.0   0.0
* 5710208   13.34    0.00855    0.0   0.0
5710209   13.35    0.00477    0.0   0.0
*
*  afw tank-i no 3
5680000  afwt3i  tmdpvol
5680101  0.0  6.1  28.32  0.0  90.0  6.1  1.0-4  0.0  0
5680200  003
5680201  0.0  1.02+5  307.0
*
*  afw tank-ii no 3
5690000  afwt3ii  tmdpvol
5690101  0.0  6.1  28.32  0.0  90.0  6.1  1.0-4  0.0  0
5690200  003
5690201  0.0  1.02+5  30
*
*
************************************************************
**********
* zz11                          zlom : c11
*
************************************************************
**********
* *
* 1800000  break  sngljun
* *!++ 1800101  655010000  182000000  2.091e-05  1.0  1.0
130102  0.564  0.92
* * 1800101  655010000  182000000  2.091e-05  1.0  1.0  130102
0.85  0.92
* 1800101  655010000  182000000  2.091E-05  1.0  1.0  130100
0.85  1.20
* 1800201  0  0.0  0.0  0.0
*
* zlom-spoj iz btestm3n2.dat
1800000  break  sngljun
* 1800101  655010000  182000000  2.091e-05  1.0  1.0  130100
0.85 1.0 1.1
1800101  655010000  182000000  2.091e-05  1.0  1.0  130100
0.80 1.0 1.1
1800201  0  0.0  0.0  0.0
*
1820000  bline  snglvol
1820101  1.6619-3  10.0  0.0  0.0  0.0  0.0  1.0e-04  0.0  00
1820200  3  155.0e+05  533.0
*
1830000  bvent  valve
```

```
1830101  182010000  186000000  1.6600e-03  0.0  0.0  100100
1830201  0  0.0  0.0  0.0
1830300  mtrvlv
1830301  501  603  20.  0.0
*
1860000  tank  tmdpvol
1860101  1.0  0.0  5.02  0.0  0.0  0.0  1.0e-04  0.0  00
1860200  2
1860201  0.0  1.0e+05  1.0
*        blowdown tanks keep the pressure at a level which is
not likely
*        to influence the break flow rate (str.25/50)
*
*
*************************************************************
**********
*                    separator pare ---> branch
*
*************************************************************
**********
*
*
* sek. sistem: separator pare
3070000 separ  branch
3070001 3  0
3070101 0.0  1.9430  0.09467  0  90.0  1.9430  0.1e-04  0.249
00
3070200 100  6.84720e+06  1.24232e+06  2.58325e+06  1.51410e-
01
3071101 307010000  310000000  4.8695e-02  0.82  0.14  00000
3072101 307000000  308000000  44.9150e-02  0.26  0.23  00000
3073101 303010000  307000000  4.8695e-02  0.0  0.0  00000
3071201  3.70160e-01  3.98960e-01  0.00000e+00
3072201 -3.15359e-03 -4.57862e-03  0.00000e+00
3073201  3.41760e-01  3.73780e-01  0.00000e+00
*
* sek. sistem: separator pare
4070000 separ  branch
4070001 3  0
4070101 0.0  1.9430  0.09467  0  90.0  1.9430  0.1e-04  0.249
00
4070200 100  6.84752e+06  1.24169e+06  2.58326e+06  1.34150e-
01
4071101 407010000  410000000  4.8695e-02  0.82  0.14  00000
4072101 407000000  408000000  44.9150e-02  0.26  0.23  00000
4073101 403010000  407000000  4.8695e-02  0.0  0.0  00000
4071201  2.81190e-01  3.10730e-01  0.00000e+00
4072201  6.34319e-03  4.91488e-03  0.00000e+00
4073201  3.39400e-01  3.73280e-01  0.00000e+00
*
* sek. sistem: separator pare
5070000 separ  branch
5070001 3  0
5070101 0.0  1.9430  0.09467  0  90.0  1.9430  0.1e-04  0.249
00
5070200 100  6.84752e+06  1.24169e+06  2.58326e+06  1.34150e-
01
5071101 507010000  510000000  4.8695e-02  0.82  0.14  00000
5072101 507000000  508000000  44.9150e-02  0.26  0.23  00000
5073101 503010000  507000000  4.8695e-02  0.0  0.0  00000
5071201  2.81210e-01  3.10750e-01  0.00000e+00
5072201  6.34086e-03  4.91256e-03  0.00000e+00
5073201  3.39400e-01  3.73280e-01  0.00000e+00
*
*
```

```
*************************************************************
**********
*
*
* hhss          heat structure thermal property data
*
*
*
*************************************************************
**********
*
* composition type and data format
*
20100100 tbl/fctn  1  -1  * stainless steel
20100200 tbl/fctn  2   2  * boron nitride (heater rods)
20100300 tbl/fctn  1  -1  * inconel 600
*
* thermal conductivity data
*
* stainless steel
20100101  293. 13.9, 373. 15.1, 473. 16.7, 573. 18.3, 673.
19.8, 873. 23.0,
*! 20100102 1073. 26.1
20100102 1073. 26.1 1473. 26.1
* boron nitride
*! 20100201  473. 1073. 2. 0. 0. 0. 0. 0. 0.
20100201  293. 1473. 2. 0. 0. 0. 0. 0. 0.
* inconel 600
20100301  293. 14.9, 373. 15.6, 473. 17.2, 673. 20.4, 873.
23.7, 1073. 27.4
*
* volumetric heat capacity data
*
* stainless steel
20100151  3.57870+6, 3.88778+6, 4.09768+6, 4.20898+6,
4.26474+6, 4.41405+6,
*! 20100152  4.65555+6
20100152  4.65555+6 4.65555+6
* boron nitride
*! 20100251  473. 1073. 1.46+6 1.62+3 0. 0. 0. 0. 0.
20100251  293. 1473. 1.46+6 1.62+3 0. 0. 0. 0. 0.
* inconel 600
20100351  3.76320+6, 3.85526+6, 4.02919+6, 4.26422+6,
4.68003+6, 4.98467+6
*
*
*************************************************************
**********
*
* comparison report dodatki
*
20516000  avgrhof  sum  0.0833  0.0  1
20516001  0.0  1.0 rhof 131010000  1.0 rhof 131020000  1.0
rhof 131030000
20516002       1.0 rhof 131040000  1.0 rhof 131050000  1.0
rhof 131060000
20516003       1.0 rhof 131070000  1.0 rhof 131080000  1.0
rhof 131090000
20516004       1.0 rhof 131100000  1.0 rhof 131110000  1.0
rhof 131120000
*
20516100  clev1  sum  1.0  0.0  1   * 101.94 = 1000*1/9.81
[kpA-->pA]
20516101  0.0  101.94  cntrlvar 240  -5.61  rhog 131060000
*
20516200  clev2  sum  1.0  0.01  1
```

```
20516201  0.0  1.0  cntrlvar 160  -1.0  rhog 131060000
*
* ctv 163: collapsed liquid core level [m]
20516300  corelev1  div  1.0  0.1  3  0.0  9.5
20516301  cntrlvar 162  cntrlvar 161
*
*************************************************************
**********
*
* ctv 146: maximum httemp rx core, right-wall surface
20514600  maxrxt   stdfnctn  1.0  600.  1
20514601  max  httemp  131000106  httemp 131000206
20514602       httemp  131000306  httemp 131000406
20514603       httemp  131000506  httemp 131000606
20514604       httemp  131000706  httemp 131000806
20514605       httemp  131000806  httemp 131001006
20514606       httemp  131000906  httemp 131001206
*
* zacetno stanje: mcp(0) + msm2(0) + msm3(0)
*                 1949 KG + 286 KG  + 286 KG  =  2521 KG
20517000  mcp  sum  1.0  1949.0  0
20517001  2521.0  -1.0 cntrlvar 271  -1.0 cntrlvar 275
20517002          -1.0 cntrlvar 276  +1.0 cntrlvar 274
*
*************************************************************
**********
*
* ***** end *****
```

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S. Smith, NRC Project Manager

11. ABSTRACT *(200 words or less)*

RELAP5 computer code was used to simulate an experiment designated 9.1.b, (2" Cold Leg Break without HPSI and with Delayed Ultimate Procedure) performed on BETHSY integral test facility. This test is characterized as beyond design transients scenarios with unavailability of some safety and protection systems. The calculations which have been completed using the computer Sun Sparcstation 20 aim to evidence the difference between experimental and computed data. Generally, an agreement of major transient trends is shown to be obtained in the simulation.

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