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Evaluation of the Maximum Heat Load on the Ultimate Heat Sink System of the Waterford 3 Nuclear Power Plant

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Appendix E - UNIVERSITY HONORS PROGRAM SENIOR PROJECT - APPROVAL

Name: Jarrod Edwards

College: Engineering Department: Nuclear Engineering

Faculty Mentor: Dr. Arthur E. Ruggles

PROJECT TITLE: Evaluation of the Maximum Heat Load on the Ultimate Heat Sink System of the Waterford 3 Nuclear Power Plant

I have reviewed this completed senior honors thesis with this student and certify that it is a project commensurate with honors level undergraduate research in this field.

Signed: Arthur E. Ruggles, Faculty Mentor

Date: 4/19/02

General Assessment - please provide a short paragraph that highlights the most significant features of the project.

Comments (Optional):

OPERATIONAL AND SAFETY RELATED ANALYSIS FOR NUCLEAR POWER PLANTS FOLLOWS A VERY FORMALIZED PROCESS WITH SEVERAL CHECKS FOR QUALITY OF INPUT, SUITABILITY OF TOOLS, AND SENSIBILITY OF RESULTS. JARROD IS FAMILIAR WITH THIS PROCESS AND HAS CONTRIBUTED TO THE SAFETY RELATED ENGINEERING DOCUMENTATION FOR THE WATERFORD 3 NUCLEAR POWER PLANT. THIS IS A FAIRLY HIGH LEVEL OF ENGINEERING ACTIVITY AND IS CERTAINLY ADEQUATE AS AN HONORS PROGRAM SENIOR PROJECT. THE CONTAINMENT RESPONSE SIMULATIONS EXERCISED KNOWLEDGE IN THERMAL SCIENCES AND THERMODYNAMICS, AND REINFORCED JARROD'S KNOWLEDGE IN THESE AREAS.

Evaluation of the Maximum Heat Load on the Ultimate Heat Sink System of the Waterford 3 Nuclear Power Plant

Senior Honors Thesis

By: Jarrod Edwards

ABSTRACT

The focus of my senior thesis is to develop a formal calculation package to determine the maximum heat load on the Ultimate Heat Sink System (UHSS) at the Waterford 3 Nuclear Power Plant, located in Killona, LA, following a double ended slot break on the hot, pump suction, or pump discharge leg of a reactor coolant loop. Secondary goals are to determine the total heat removed by the UHSS following this break and qualitatively evaluate the change in reported margin from old calculations with regard to the wet cooling towers.

This calculation is accomplished using the GOTHIC 5.0c (Generation of Thermal Hydraulic Information for Containment) computer code and uses data obtained from other calculations that determine flow rates and equipment performance information. This data is used to develop models of the containment building following each type of loss of coolant accident (LOCA). The models are then used to calculate the heat load on the UHSS, as well as the total heat removed by the UHSS over a period of approximately 11.5 days. This information is then compared to other calculations currently in use to determine gain in reported margin by this new calculation. This calculation will be incorporated as part of the safety and analysis documentation of Waterford 3 and will be referenced by other calculations for design and licensing purposes.

By this calculation, a hot leg LOCA results in $1.468 * 10^8$ BTU/hr, the maximum possible heat load on the UHSS. This is independent of safety injection flow because the peak occurs before the reactor coolant blowdown phase is completed, thus before safety injection (SI) flow initiates. On the other hand, a pump discharge leg LOCA with minimum SI flow results in $1.527 * 10^{10}$ BTU cumulatively over 11.5 days. The results

of this calculation allow for a substantial gain in reported safety margin for the UHSS, with a special regard for the wet cooling towers.

From this project, I have gained practical experience that combines skills that I have learned in class with technology currently in use by the industry. This has allowed me to study and be involved with larger scale work in thermal hydraulics as well as learn about the calculation and documentation process in the industry.

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LIST OF ACRONYMS

CCW – Component Cooling Water

CFC – Containment Fan Cooler

CS – Containment Spray

LOCA – Loss of Coolant Accident

PWR – Pressurized Water Reactor

SDCHX – Shut Down Cooling Heat Exchanger

SI – Safety Injection

UHSS – Ultimate Heat Sink System

INTRODUCTION

In a typical commercial nuclear power plant, the nuclear reactor is cooled by water that flows through large diameter pipes from the reactor to a heat exchanger, called the steam generator, which removes heat from the water. The steam generator then transfers the heat to the "secondary side" so that electricity may be produced. The cooled water in the primary side flows from the steam generator to a pump, which pumps the water back to the reactor. This section of the cooling system is called a "primary loop". The plant that I use for my calculation has two primary loops to cool the reactor. For designation, the piping in a primary loop is subdivided into three sections: the "hot leg", the "suction leg", and the "discharge leg". The hot leg is that section of piping through which water flows from the reactor to the steam generator; the suction leg is that section of piping through which water flows from the steam generator to the pump, and the discharge leg is that section of piping through which water flows from the pump back to the reactor.

A rupture in the piping of a primary loop is called a "loss of coolant accident", or LOCA. If a LOCA occurs, less water is recirculating to the reactor; thus, the reactor is not cooled as quickly as normal. If the area through which coolant is lost is sufficiently large, the accident is referred to as a "large break LOCA". If a large break LOCA occurs, something must be done in order to continue removing heat from the reactor, or the heat could buildup to sufficient levels that the equipment and fuel cladding melt, which would greatly increase the risk of the release of the radioactive products of fission to the environment. Also, as the coolant is released to the large concrete vessel housing the

reactor, called the "containment", the coolant becomes steam and the pressure in containment rises dramatically.

At Waterford 3, two types of devices are used to cool and reduce pressure in containment given this type of accident: containment fan coolers (CFCs) and containment sprays (CSs). The CFCs cool containment by blowing air inside containment across tubes filled with cooler component cooling water (CCW). The CCW is then cooled by the ultimate heat sink system (UHSS), which consists of dry cooling towers, wet cooling towers, and a shut down cooling heat exchanger (SDCHX). The CSs cool and reduce pressure in containment by spraying cool water from a tank into the containment building. The water is then collected at the bottom of containment, cooled by the UHSS, and recirculated back through the containment sprays. Consequently, all heat removed from the containment is ultimately removed by the ultimate heat sink system.

It is important to determine the maximum heat load on the UHSS in order to evaluate the physical capability of the UHSS to reduce adequately the heat that is transferred to the outer containment by a large break LOCA. These capability limitations include the ability of the UHSS to remove heat as quickly as the heat is being generated and the ability of the dry cooling towers, wet cooling towers, and SDCHX to function under these thermally extreme conditions without failure. The heat load limitations are known and provided by the manufacturer. The goal of the calculation is to calculate the maximum heat load possible on the UHSS and determine how far below the UHSS operating limit the heat produced is. A special focus by the design group on this calculation is the evaluation of the difference in reported margin for the wet cooling towers with this calculation. Reported margin is the calculated difference between the

worst case scenario that a component or system will undergo and the physical limitations of that component or system. Though the calculation does not change the actual physical margin of the component, a better reported margin shows that the capability of the system has always been better than previously calculated.

Waterford 3 is a pressurized water reactor (PWR) located in Killona, LA, approximately 15 miles from New Orleans. The two loop Westinghouse reactor produces 1130 MW of electricity and is owned by Entergy Operations, Inc. Waterford 3 began operation in 1985.

CALCULATION PROCESS

The process by which a large-scale calculation is performed in the nuclear industry is quite involved, and the ultimate goal of the process is called a calculation package. A calculation package is a document that thoroughly explains the calculation itself. This includes detailing the purpose of the calculation, listing and justifying the assumptions made, referencing all data used in the calculation and validation of computer codes used in the calculation, and explaining the validity of the results. The calculation package is important because it allows someone who reads the calculation to verify the accuracy of the results and use them for licensing and design purposes. The level of detail involved in a calculation package theoretically allows one to validate all input and recreate the entirety of the calculation to reproduce the results.

The process for my calculation began shortly after May 18, 2001 at Waterford 3 when I was informed of the task outline and introduced to my supervising engineer Nasser Pazooki. During the first week, Nasser explained the project details to me and helped me begin learning the GOTHIC 5.0c code. During the week, I learned the code by reading the GOTHIC manual, studying previously established models, and building an example model described in the manual.

The model for the calculation was made by making appropriate changes to previous models of the primary loop involving large break LOCA scenarios. The changes included assumptions that maximize the heat load on the UHSS, which are detailed in the calculation package. After becoming sufficiently proficient in GOTHIC, I began gathering the information pertaining to the CFCs and SDCHXs that would need to be changed in the computer models. This involved making small-scale calculations,

contacting on-site engineers to obtain books with relevant data, and accordingly changing the computer models. In addition, certain material properties, fluid flow rates, the CCW temperature, and the run times were changed. The details of these changes are highlighted in section 4 of the calculation package.

Once the models were developed, they were evaluated for the given run times, and the output data was copied to a spreadsheet in Microsoft Excel for easier manipulation. The data was searched for the maximum heat load, and graphs were developed to illustrate the heat loads and heat build up over time.

Following this development, I began development of the calculation documentation, which was continually reviewed and edited by my supervising engineer. During this period, a meeting with my supervisor, my supervising engineer, the supervisor of the design department, and myself was held to discuss the results of the calculation. At this meeting, another variable, which was not varied in the previous computer calculations, was discussed. Shortly thereafter, a parametric study of this variable, the time following LOCA for the activation of the CFCs, showed that a different time than that used in the first set of calculations produced a larger maximum heat load. Thus, each case was rerun using the new activation time for the CFCs, and the new data was evaluated similarly to the first cases.

Following these calculations, the documentation was completed under the close guidance and review of my supervising engineer. Patrick Fresnada, another Waterford engineer, then reviewed the calculation for error and approved the calculation package for admittance into the Waterford 3 reference library and use in design and plant documentation work.

CONCLUSION

In completing this project, I gained practical experience that combines skills that I have learned in class with technology currently in use by the industry. I had the opportunity to use and build upon my skills in the study of heat transfer to perform work that ultimately benefited Entergy and Waterford 3 in a very practical way. I also had the opportunity to expand my knowledge of computer codes by learning to use GOTHIC 5.0c, a code used by the nuclear industry to perform practical thermal hydraulics work. Finally, I was exposed to the process by which the nuclear power industry develops large-scale calculations to be used in determining plant modifications and validation. A copy of the calculation package is included following this report.

CALCULATION PACKAGE

B13.40 (Original R-Type or R-Type from Attachment 7.7)

CALCULATION NO. EC-S01-005 REV. NO. A

TITLE Post-LOCA Containment Heat Load on Ultimate Heat Sink System

SUBJECT Post-LOCA Containment Heat Load on Ultimate Heat Sink System

AFFECTED SYSTEMS

THIS CALCULATION SUPERSEDES

COMPUTER SOFTWARE USED GOTHIC (CODE) 5.0c (VERSION) 2 (DISK)

CALCULATION CLASSIFICATION:

[ ] Non-Quality Related [x] Safety Related

[ ] Quality Related: Important to Safety

CALCULATION PERFORMED UNDER:

[x] Waterford 3 Procedures

[ ] Supplier Approved Quality Procedures

CALCULATION STATUS:

[ ] Final - List Pending Calculation(s) and/or Calculation Changes Incorporated

[ ] Void

[ ] Superseded - New Calc. No.

[x] Pending (Not Currently Installed)

[ ] Partially Installed/Implemented Initial Date

[ ] Completely Installed/Implemented Initial Date

[ ] Canceled Initial Date

[ ] Study - Does Not Represent, And Can Not Be Used For The Design Basis of The Plant

Prepared By: Jarrod Edwards/ Nasser Pazooki ENGINEER Date: 7/31/01

Verified/Reviewed By: Patrick J. Fresneda Date: 7/31/01

Approved By: Jerry Holman/ SUPERVISOR Date:

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1. Purpose:

This calculation documents the Waterford 3 containment heat load on the Ultimate Heat Sink System (UHSS) following a limiting Loss of Coolant Accident (LOCA). The containment heat load is transferred to the UHSS (component cooling water) through containment fan coolers (CFC) and a shutdown cooling heat exchanger that cools the containment spray water during the recirculation mode.

The containment and component responses are analyzed using GOTHIC (Generation of Thermal-Hydraulic Information for Containment), version 5.0c code (References 1-4). GOTHIC is a general-purpose thermal-hydraulic computer program for design, licensing, safety and operating analysis of nuclear power plant containment and other confinement buildings. Numerical Applications, Inc. (NAI) developed the code for the Electric Power Research Institute (EPRI). This version is fully qualified under the NAI QA program that conforms to the requirements of 10CFR50 Appendix B with error reporting in accordance with 10CFR21. For Waterford 3 applications, the code is installed and is verified against vendor (NAI) supplied standard problem results.

References 5 and 9 document the Waterford 3 design basis post-LOCA containment pressure and temperature response analysis using GOTHIC 5.0c. The events analyzed in References 5 and 9 include double ended hot leg slot break, double ended suction leg slot break and double ended discharge leg slot break using both maximum and minimum safety injection flow. These LOCA cases from References 5 and 9 are re-analyzed in this calculation to determine the limiting event for containment heat load on the UHSS. The models used in this calculation assume one containment spray (CS) and two CFCs are operable for both maximum and minimum safety injection flow cases.

Therefore, the main objectives of this calculation are to:

- Determine the limiting LOCA case resulting in the maximum heat load on the Ultimate Heat Sink System (UHSS), and
- Determine the integrated containment heat load on the UHSS for 10^6 seconds following LOCA.

2. References:

1. George, T. L., et al., NAI 8907-06, Rev. 5, "GOTHIC Containment Analysis Package, Technical Manual, Version 5.0," December 1995.

2. George, T. L., et al., NAI 8907-02, Rev. 6, "GOTHIC Containment Analysis Package, User Manual, Version 5.0," December 1995.

3. Wiles, L. E., et al., NAI 8907-09, Rev. 3, "GOTHIC Containment Analysis Package, Qualification Report, Version 5.0," December 1995.

4. George, T. L., et al., NAI 8907-08, Rev. 5, "GOTHIC Containment Analysis Package, Installation and Operations Manual, Version 5.0," December 1995.

5. Waterford 3 Calculation Package EC-S98-015, "Waterford 3 Containment Licensing Basis and Sensitivity Analysis – GOTHIC 5.0c", 6/9/99.

6. Waterford 3 Calculation Package EC-S96-015, Rev. C, "Containment Cooler Performance Analysis", 7/11/97.

7. Waterford 3 Calculation Package MN(Q)-9-1, Rev. 0, "Shutdown Cooling Heat Exchanger "U" Value", 3/16/1998.

8. STER computer code, Version 5.04, Vendor Manual 460000024.

9. Waterford 3 Calculation Package EC-S98-003, "Waterford 3 Containment Licensing Basis Analysis – GOTHIC 5.0c," 6/23/1998

10. Waterford 3 Calculation Package EC-S97-003, "GOTHIC 5.0c Verification", June 17, 1997

3. Method

As discussed in the Purpose section, the main objectives in this calculation are to:

- Determine the LOCA case that results in the maximum heat load on the UHSS, and
- Determine the heat removed by the UHSS during 10^6 seconds following the large break LOCA

The GOTHIC input files for the hot leg, suction leg and discharge leg breaks for both minimum and maximum safety injection flow are obtained from References 5 and 9. These files are then modified to include the data for the CFCs (Ref. 6) and the Shutdown Cooling Heat Exchanger (SDCHX) (Ref. 7) that will maximize the heat removal from the containment. The total heat removal rate for the CFC and SDCHX is calculated by GOTHIC for the duration of the event for each LOCA case. The maximum heat removal rate for each case is then compared to determine the limiting LOCA case.

The sum of the CFCs and SDCHX heat removal rates is integrated in order to determine the total heat removed from the containment at any time post-LOCA for 10^6 seconds (about 11.5 days).

4. Inputs and Assumptions:

The majority of GOTHIC inputs and assumptions used in this calculation are the same as inputs and assumptions used in References 5 and 9, from which the base models are obtained.

This section provides modified inputs and assumptions for various parameters used in this calculation regarding CFC performance and SDCHX performance. All other component data is consistent with base model components. Data tables used in GOTHIC models are included in Attachments I – VI for Hmax1s2f, Hmin1s2f, Dmax1s2f, Dmin1s2f, Smax1s2f, and Smin1s2f cases, respectively, where "H" refers to a hot leg break, "D" refers to a discharge leg break, "S" refers to a suction leg break, "max" refers to maximum safety injection, "min" refers to minimum safety injection, and "1s2f" refers to the operability of 1 CS and 2 CFCs. Due to technical difficulties, tables for the Dmax1s2f and Smin1s2f cases are printed using GOTHIC 6.1; however, all cases are modeled and all results are obtained using GOTHIC 5.0c.

4.1 CFC Performance

Waterford 3 CFC performance (heat removal as a function of containment temperature) is obtained from Reference 6. The following table provides the CFC performance data used in this calculation, as well as the input data used to calculate CFC performance:

CCW Flow (gpm)	CCW Temp. (°F)	Air Flow (ACFM)	Fouling Factor	Cont. Temp. (°F)	Heat Removal Rate (Btu/hr)	(Btu/sec)
1350	112	45000	0.0000	130	4955797	1376.6
				150	12211670	3392.1
				200	38095227	10582
				251	71103454	19751
				261	77724031	21590

Setting CCW flow equal to 1350 gpm is conservative because this is the peak flow by the CCW in the fan, which is well above the technical specification required flow of 1100 gpm. Also, CCW temperature of 112 °F is less than the post accident CCW temperature set point of 115 °F (FSAR Table 6.2-21); therefore, 112 °F is a more efficient CCW temperature, allowing for greater heat transfer.

The CFC airflow of 45000 ACFM greatly exceeds the design flow of 37800 ACFM. The fouling factor is conservatively set to zero to allow for maximum heat transfer.

CFC performance data assumes that there is no heat removal below 130 °F, which is non-conservative but reasonable since the temperature reaches 130 °F in less than 0.3 seconds, and heat removal is relatively small for temperatures less than 130 °F. CFC heat removal

data above 261 °F is unnecessary because, for these models, containment temperature never exceeds this value.

The above table provides the information applicable to one CFC. In order to account for both CFCs in the models, the heat removal performance data is included as a heat rate forcing function, the heat rate is set to 2, and the CFC air flow rate is set to the number of CFCs times 45,000 ACFM, which, in this case, equals 90,000 ACFM.

For these GOTHIC models, CFCs are started at 10 seconds after the containment reaches 19.7 psia. The 10 seconds delay time results in the highest CFC peak heat removal rate and is obtained from informal sensitivity runs with different CFC start delay time.

4.2 Shutdown Cooling Heat Exchanger Performance:
The Shutdown Cooling Heat Exchanger cools the CS flow during recirculation mode (after RAS) where CS flows through the primary (tube) side and CCW flows through the secondary (shell) side of the heat exchanger.

As for CFCs the heat exchanger data for all LOCA cases obtained from References 5 and 9 are revised to conservatively maximize the heat exchanger heat removal rate. These data are obtained from Reference 7.

Tube thermal conductivity = 8.99 BTU/hr-ft-°F
Secondary side temperature = 112 °F

SDCHX primary side flow = 1800 gpm
*1800 gpm * .13368 ft^3/gal * 1 min/60 sec = 4.01 ft^3/sec*
Note: The pre-RAS CS flow of 1750 gpm (242.17 lbm/sec at 100 °F) is assumed; however, the post-RAS CS flow of 1800 gpm is assumed. This is conservative since a lower pre-RAS CS flow results in higher containment heat load to be removed from containment by CFCs and the SDCHX.

Secondary side CCW flow = 3000 gpm
*3000 gpm * .13368 ft^3/gal * 1min/60 sec * 61.477 lbm/ft^3 = 410.9 lbm/sec*

SDCHX heat transfer coefficients are calculated using STER code. The STER output is provided in Attachment 8.2 of Reference7.

Primary side HTC = 855.65 Btu/hr-ft^2-°F
Secondary side HTC = 1344.15 Btu/hr-ft^2-°F

Both the primary and secondary side fouling factors are assumed to be zero in order to maximize heat transfer.

5.0 Results Summary

In this calculation, the large break LOCA models obtained from References 5 and 9, are modified in order to maximize the heat removal rate by CFCs and SDCHX and in turn maximize the heat load on the Ultimate Heat Sink System. LOCA calculations are performed for three break locations: (1) reactor coolant pump (RCP) discharge leg break, (2) RCP suction leg break, and (3) hot leg break. Each of these cases is evaluated for both maximum and minimum safety injection flows with one operable CS and two CFCs.

In order to evaluate the containment heat load on the UHSS, a control variable is established in GOTHIC equal to the summation of the heat load on the CFCs and the SDCHX (GOTHIC_S variable htq in location cH1C and GOTHIC_S variable qhxa(1) in location cX1H respectively). The following table provides the peak containment heat load for all LOCA cases and the timing of the peak heat load:

LOCA Cases	Max Heat Load (Btu/sec)	Max Heat Load (Btu/hr)	Time (sec after LOCA)
Hmax1s2f	$4.078 * 10^4$	$1.468 * 10^8$	12.16
Hmin1s2f	$4.078 * 10^4$	$1.468 * 10^8$	12.16
Dmax1s2f	$3.951 * 10^4$	$1.422 * 10^8$	12.46
Dmin1s2f	$3.951 * 10^4$	$1.422 * 10^8$	12.46
Smax1s2f	$3.893 * 10^4$	$1.401 * 10^8$	16.96
Smin1s2f	$3.893 * 10^4$	$1.401 * 10^8$	16.96

Dmax1s2f, Hmax1s2f, and Smax1s2f represent the cases for the discharge leg, hot leg, and suction leg double ended slot breaks, respectively, with maximum safety injection flow. Dmin1s2f, Hmin1s2f, and Smin1s2f represent the cases for the discharge leg, hot leg, and suction leg double ended slot breaks, respectively, with minimum safety injection flow.

These results show that the hot leg break results in the highest heat load on the UHSS, which is equal to $1.468 * 10^8$ Btu/hr at 12.16 seconds following LOCA. This table also illustrates the fact that peak UHSS load is independent of safety injection (SI) flow. This is true because the peak load occurs during the blowdown phase, before SI flow is initiated. The blowdown for hot leg break end at about 15 seconds after LOCA.

The integrated containment heat load on the UHSS for these cases are evaluated for 10^6 seconds, or approximately 11.5 days, after LOCA. The following table provides the total integrated CFCs plus SDCHX heat load on UHSS after 11.5 days for all LOCA cases:

LOCA Cases	Heat Removed over 10^6 seconds (Btu)
Hmax1s2f	$1.335 * 10^{10}$
Hmin1s2f	$1.489 * 10^{10}$
Dmax1s2f	$1.388 * 10^{10}$
Dmin1s2f	$1.527 * 10^{10}$
Smax1s2f	$1.350 * 10^{10}$
Smin1s2f	$1.504 * 10^{10}$

With regard to total heat removal, the limiting case is a break in the discharge leg with minimum SI flow resulting in $1.527 * 10^{10}$ Btu removed over the 10^6 second period.

6.0 Calculations

This section provides for:

- Determination of the limiting LOCA case for containment heat load on the Ultimate Heat Sink System
- Determination of the heat removed by the UHSS from the containment through 10^6 seconds following a large break LOCA

6.1 Determination of the Limiting LOCA Case for Heat Load on the UHSS

References 10 provide verification of the proper installation of GOTHIC 5.0c and verification of the results on the computer.

Base models of these LOCA cases are obtained by copying files documented in References 5 and 9 as follows:

Copy From	Copy To
Dmax1s1f	Dmax1s2f
Hmax1s1f	Hmax1s2f
Smax1s1f	Smax1s2f
Dmin1s1f	Dmin1s2f
Hmin_new	Hmin1s2f
Smin1s1f	Smin1s2f

After the modifications described in the Inputs and Assumptions section are applied to the new models, an informal sensitivity study is performed in order to determine the worst delay time for the start of the CFCs that maximizes the peak heat load on the UHSS. Heat load peaks are evaluated for the 0.0, 7, 8, 9, 10, 11, 12, 15 (representing end of blowdown), 20.5, and 32.5 (representing the delay time for the loss of offsite power case) seconds delay for the CFC start time respectively. From this study, a trip delay time of 10 seconds is determined to result in the maximum containment heat load peak on the UHSS. This delay time is then applied to all cases for the formal evaluation.

The LOCA cases are run for 10^6 seconds (the amount of time that the post-LOCA mass and energy release data to the containment are available), or approximately 11.5 days. The total containment heat load on the UHSS is evaluated in GOTHIC by establishing a control variable equivalent to the summation of the heat load on the CFCs and the SDCHX. The largest peak heat load is then determined by comparing the peak heat load for all cases. The following table contains the peak containment heat load for all LOCA cases:

LOCA Cases	UHSS Max (Btu/sec)	UHSS Max (Btu/hr)	Time (sec after LOCA)
Hmax1s2f	$4.078 * 10^4$	$1.468 * 10^8$	12.16
Hmin1s2f	$4.078 * 10^4$	$1.468 * 10^8$	12.16
Dmax1s2f	$3.951 * 10^4$	$1.422 * 10^8$	12.46
Dmin1s2f	$3.951 * 10^4$	$1.422 * 10^8$	12.46
Smax1s2f	$3.893 * 10^4$	$1.401 * 10^8$	16.96
Smin1s2f	$3.893 * 10^4$	$1.401 * 10^8$	16.96

Attachment I through VI provide the GOTHIC input and GOTHIC results in graphical form (containment heat load versus time and integrated containment heat load for 10^6 seconds or about 11.5 days) for Hmax1s2f, Hmin1s2f, Dmax1s2f, Dmin1s2f, Smax1s2f, and Smin1s2f respectively.

6.2 Heat removed over 10^6 seconds following a large break LOCA

In order to determine the heat removed during the 10^6 second period, another control variable is established in GOTHIC which integrates the heat load control variable to determine the total heat removed. The results are illustrated in the following table:

LOCA Cases	Heat Removed over 10^6 seconds (Btu)
Hmax1s2f	$1.335 * 10^{10}$
Hmin1s2f	$1.489 * 10^{10}$
Dmax1s2f	$1.388 * 10^{10}$
Dmin1s2f	$1.527 * 10^{10}$
Smax1s2f	$1.350 * 10^{10}$
Smin1s2f	$1.504 * 10^{10}$

Attachment I

Hmax1s2f

Attachment I to EC-S01-005 - Hmax1s2f
Thu Jun 15 09:30:19 2001
GOTHIC Version 5.0(QA)-c - April 1996

Control Volumes

Vol #	Description	Vol (ft3)	Elev (ft)	Ht (ft)	Hyd. D. (ft)	L/V IA (ft)	Burn Opt
1	RCB Atmosphere	2580000.	35.	208.	70.	DEFAULT	NONE
2	RCB Sump	97000.	19.	16.	5.	15000	NONE

Fluid Boundary Conditions - Table 1

BC#	Description	Press. (psia)	FF	Temp. (F)	FF	Flow (lbm/s)	FF	On Trip	Off Trip
1F	Blowdown Flow	1.	3	E1.0	2	1.0	1	0	
2F	Spray: pre-RAS	14.7	0	100.00		242.17	5	2	
3F	Sump Suction	14.7				v-4.010	10	0	
4C	Spray: Recirc	14.7						0	
5F	Long Term Liqui	14.7		E1.0	9	1.0	8		
6F	Sump Liquid Rem	14.7		0	0	1.0	11		
7F	Long Term Relea	1.	3	E1.0	13	1.0	12	0	
8F	SIT Nitrogen	100.	0	120	0	1.0	14	0	

Fluid Boundary Conditions - Table 2

BC#	Liq. V. Frac.	FF	Stm. P.R.	FF	Drop D (in)	FF	Cpld BC#	Flow Frac.	FF	Heat (Btu/s)	FF	Outlet Quality
1F	0.		1.0000		0.0039	0						DEFAULT
2F	1.		1.0000		0.0276							DEFAULT
3F	1.		1.0000		NONE							DEFAULT
4C	1.		1.0000		NONE		3F	1.		0.		DEFAULT
5F	1.		1.0000		NONE							DEFAULT
6F	1.		1.0000		NONE							DEFAULT
7F	0.		1.0000		0.0039	0						DEFAULT
8F	0.		0		NONE	0						DEFAULT

Attachment I to EC-S01-005 - Hmax1s2f
Thu Jun 15 09:30:19 2001
GOTHIC Version 5.0(QA)-c - April 1996

Fluid Boundary Conditions - Table 3 Gas Pressure Ratios								
BC#	Air Gas 1	FF	N2 Gas 2	FF	Gas 3	FF	Gas 4	FF
1F	0.		0.		0.		0.	
2F	0.		0.		0.		0.	
3F	0.		0.		0.		0.	
4C	0.		0.		0.		0.	
5F	0.		0.		0.		0.	
6F	0.		0.		0.		0.	
7F	0.		0.		0.		0.	
8F	0.		1.		0.		0.	

Fluid Boundary Conditions - Table 4 Gas Pressure Ratios								
BC#	Gas 5	FF	Gas 6	FF	Gas 7	FF	Gas 8	FF
1F	0.		0.		0.		0.	
2F	0.		0.		0.		0.	
3F	0.		0.		0.		0.	
4C	0.		0.		0.		0.	
5F	0.		0.		0.		0.	
6F	0.		0.		0.		0.	
7F	0.		0.		0.		0.	
8F	0.		0.		0.		0.	

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Flow Paths - Table 1

F.P. #	Description	Vol A	Elev (ft)	Ht (ft)	Vol B	Elev (ft)	Ht (ft)
1	RCB Open Space	1	35.15	0.35	2	34.89	0.1
2	Blowdown Flow	1	47.125	2.5	1F	47.125	2.5
3	Spray:pre-RAS	1	220.	0.5	2F	220.	0.5
4	Sump Suction Fl	2	20.75	2.	3F	20.75	2.
5	Spray: Recirc	1	220.	0.5	4C	220.	0.5
6	Liq.to Sump	2	20.75	2.5	5F	20.75	2.5
7	Liq From sump	2	20.75	2.5	6F	20.75	2.5
8	Long Term Flow	1	47.125	2.5	7F	47.125	2.5
9	SIT Nitrogen	1	47.125	2.5	8F	47.125	2.5

Flow Paths - Table 2

Flow Path #	Flow Area (ft2)	Hyd. Diam. (ft)	Inertia Length (ft)	Friction Length (ft)	De-Entrmt Frac.	Mom Trn Opt
1	10000.	15.	112.	0.25	0.	-
2	9.817	2.5	10.	0.		-
3	0.4481	0.7553	200.	0.		-
4	3.14	2.	25.	0.		-
5	0.4481	0.7553	200.	0.		-
6	9.817	2.5	10.	0.		-
7	1000.	15.	10.	0.		-
8	9.817	2.5	10.	0.		-
9	9.817	2.5	10.	0.		-

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Flow Paths - Table 3

Flow Path #	Fwd. Loss Coeff.	Rev. Loss Coeff.	Comp. Opt.	Critical Flow Model	Discharge Coeff.
1	0.01	0.01	OFF	OFF	1.
2	0.	0.	OFF	OFF	1.
3	0.	0.	OFF	OFF	1.
4	0.	0.	OFF	OFF	1.
5	0.	0.	OFF	OFF	1.
6	0.	0.	OFF	OFF	1.
7	0.	0.	OFF	OFF	1.
8	0.	0.	OFF	OFF	1.
9	0.	0.	OFF	OFF	1.

Thermal Conductors

Cond #	Description	Vol A	HT Coef	Vol B	HT Coef	Cond Type	S. A. (ft2)	Init. T.(F)	Or
1	Cont.Wall	1	1	1	2	2	61400.	120.	X
2	Base Concrete	2	3	2	2	3	15275.	120.	F
3	Cont.Dome	1	1	1	2	1	30500.	120.	X
4	Thick Sump Conc	2	3	2	2	4	5296.	120.	F
5	Thin Sump Conc.	2	3	2	2	5	3173.	120.	F
6	Thick Conc. Hi	1	1	1	2	7	9815.	120.	I
7	Thin Conc. Hi	1	1	1	2	6	47192.	120.	I
8	SS:Ref.Pool etc	1	1	1	2	8	28860.	120.	I
9	Galv.Steel 37.5	1	1	1	2	9	26266.	120.	I
10	Galv.Steel 78.3	1	1	1	2	10	153503.	120.	I
11	Galv.Steel .4"	1	1	1	2	11	9405.	120.	I
12	Misc.St. 71	1	1	1	2	12	92006.	120.	I
13	Misc.St. .16"	1	1	1	2	13	87292.5	120.	I
14	Misc.St. .41"	1	1	1	2	14	186484.	120.	I
15	Misc.St. .74"	1	1	1	2	15	30993.	120.	I
16	Misc.St. 1.7"	1	1	1	2	16	22655.	120.	I

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Thermal Conductors - Table 2

Cond #	Therm. Rad. Side A	Emiss. Side A	Therm. Rad. Side B	Emiss. Side B
1	No		No	
2	No		No	
3	No		No	
4	No		No	
5	No		No	
6	No		No	
7	No		No	
8	No		No	
9	No		No	
10	No		No	
11	No		No	
12	No		No	
13	No		No	
14	No		No	
15	No		No	
16	No		No	

Heat Transfer Coefficient Types - Table 1

Type #	Heat Transfer Option	Nominal Value	FF	Cnd Cnv Opt	Cnd Opt	Sp Cnv HTC	Nat Cnv Opt	For Cnv Opt	Rad Opt
1	Tagami		0	XOR	UCHI		VERT SURF	OFF	OFF
2	Sp Heat	0.	-		UCHI	0.0			OFF
3	Sp Conv	10.	0		-	0.0	OFF	OFF	OFF

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Heat Transfer Coefficient Types - Table 2

Type #	Phase Opt	Min Liq Fract	Max Liq Fract	Convect Bulk T Model	FF	Condensa Bulk T Model	FF
1	VAP			Tg-Tf		Tb-Tw	
2	Vecto						
3	LIQ	0.	1.	Tg-Tw			

Heat Transfer Coefficient Types - Table 3

Type #	Char. Length (ft)	Nat Coef FF	Exp FF	For Coef FF	Exp FF	Nom Vel (ft/s)	Vel FF	Minimum Conv HTC (Btu/hr-ft
1								DEFAULT
2								
3								

HTC Types - Table 4

Type #	Total Heat (Btu)	Peak Time (sec)	Initial Value (Btu/hr-ft	Post-BD Direct FF
1	320280000.	15.	0.	
2				
3				

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Thermal Conductor Types

Type #	Description	Geom	Thick. (in)	O.D. (in)	Regions	Heat (Btu/ft3-s)	Heat FF
1	Cont.Dome	TUBE	0.968	1681.936	7		
2	ContainmentWall	TUBE	1.918	1683.836	8		
3	Base Concrete	WALL	137.656	-	15		
4	Thick Conc. Lo	WALL	54.256	-	13		
5	Thin Conc. Lo	WALL	17.3680	-	12		
6	Thin Conc. Hi	WALL	19.744	-	12		
7	Thick Conc. Hi	WALL	42.616	-	13		
8	Stainless .228	WALL	0.22664	-	2		
9	Galv.St. 37.55	WALL	0.04698	-	2		
10	Galv.Steel 78.3	WALL	0.07932	-	2		
11	Galv.Steel 432.	WALL	0.4343	-	4		
12	71 Steel	WALL	0.08018	-	2		
13	164 Steel	WALL	0.17361	-	2		
14	413 Steel	WALL	0.42172	-	4		
15	739 Steel	WALL	0.75083	-	5		
16	1.7" Steel	WALL	1.6874	-	6		
17	Stainless 0.024	WALL	0.0240	-	1		

Thermal Conductor Type
1
Cont.Dome

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	4	0.000	0.007	2	0.
2	3	0.0070	0.005	1	0.
3	1	0.0120	0.050	2	0.
4	1	0.0620	0.100	2	0.
5	1	0.1620	0.200	1	0.
6	1	0.3620	0.600	2	0.
7	3	0.9620	0.006	1	0.

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Thermal Conductor Type 2 ContainmentWall					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	4	0.0000	0.007	2	0.
2	3	0.007	0.005	1	0.
3	1	0.012	0.050	2	0.
4	1	0.062	0.100	2	0.
5	1	0.162	0.200	1	0.
6	1	0.362	0.400	1	0.
7	1	0.762	01.150	2	0.
8	3	1.912	0.006	1	0.

Thermal Conductor Type 3 Base Concrete					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	5	0.0000	0.0160	4	0.
2	2	0.0160	0.010000	2	0.
3	2	0.0260	0.0200	2	0.
4	2	0.0460	0.0400	1	0.
5	2	0.0860	0.0800	1	0.
6	2	0.1660	0.1600	1	0.
7	2	0.3260	0.3200	1	0.
8	2	0.6460	0.6400	1	0.
9	2	1.2860	1.2800	1	0.
10	2	2.5660	2.5600	1	0.
11	2	5.1260	5.1200	1	0.
12	2	10.2460	10.2400	1	0.
13	2	20.4860	20.4800	1	0.
14	2	40.966	40.9600	1	0.
15	2	81.9260	55.7300	1	0.

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Thermal Conductor Type 4 Thick Conc. Lo					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	5	0.000	0.016	4	0.
2	2	0.016	0.010	1	0.
3	2	0.026	0.020	1	0.
4	2	0.046	0.040	1	0.
5	2	0.086	0.080	1	0.
6	2	0.166	0.160	1	0.
7	2	0.326	0.320	1	0.
8	2	0.646	0.640	1	0.
9	2	1.286	1.280	1	0.
10	2	2.566	2.560	1	0.
11	2	5.126	5.120	1	0.
12	2	10.246	10.240	1	0.
13	2	20.486	33.770	2	0.

Thermal Conductor Type 5 Thin Conc. Lo					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	5	0.0000	0.016	4	0.
2	2	0.0160	0.010	1	0.
3	2	0.0260	0.020	1	0.
4	2	0.0460	0.040	1	0.
5	2	0.0860	0.080	1	0.
6	2	0.1660	0.160	1	0.
7	2	0.3260	0.320	1	0.
8	2	0.6460	0.640	1	0.
9	2	1.2860	1.280	1	0.
10	2	2.5660	2.560	1	0.
11	2	5.1260	5.120	1	0.
12	2	10.2460	7.1220	1	0.

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Thermal Conductor Type 6 Thin Conc. Hi					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	5	0.0	0.016	4	0.
2	2	0.0160	0.010	1	0.
3	2	0.0260	0.020	1	0.
4	2	0.0460	0.040	1	0.
5	2	0.0860	0.080	1	0.
6	2	0.1660	0.160	1	0.
7	2	0.3260	0.320	1	0.
8	2	0.6460	0.640	1	0.
9	2	1.2860	1.280	1	0.
10	2	2.5660	2.560	1	0.
11	2	5.1260	5.120	1	0.
12	2	10.2460	9.498	1	0.

Thermal Conductor Type 7 Thick Conc. Hi					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	5	0.0	0.016	4	0.
2	2	0.0160	0.010	1	0.
3	2	0.0260	0.020	1	0.
4	2	0.0460	0.040	1	0.
5	2	0.0860	0.080	1	0.
6	2	0.1660	0.160	1	0.
7	2	0.3260	0.320	1	0.
8	2	0.6460	0.640	1	0.
9	2	1.2860	1.280	1	0.
10	2	2.5660	2.560	1	0.
11	2	5.1260	5.120	1	0.
12	2	10.2460	10.240	1	0.
13	2	20.4860	22.130	1	0.

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Thermal Conductor Type 8 Stainless .228					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	6	0.0000	0.050000	1	0.
2	6	0.050000	0.17664	2	0.

Thermal Conductor Type 9 Galv.Steel 37.5					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	7	0.0000	0.004000	1	0.
2	1	0.004000	0.04298	2	0.

Thermal Conductor Type 10 Galv.Steel 78.3					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	7	0.0	0.00080	1	0.
2	1	0.00080	0.07852	2	0.

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Thermal Conductor Type 11 Galv.Steel 432.					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	7	0.0000	0.002000	1	0.
2	1	0.002000	0.050000	2	0.
3	1	0.052000	0.099000	1	0.
4	1	0.151000	0.283300	1	0.

Thermal Conductor Type 12 71 Steel					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	8	0.0000	0.009000	2	0.
2	1	0.009000	0.071180	2	0.

Thermal Conductor Type 13 164 Steel					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	8	0.000	0.009000	2	0.
2	1	0.009000	0.16461	3	0.

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Thermal Conductor Type 14 413 Steel					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	8	0.0	0.0090	2	0.
2	1	0.0090	0.050000	2	0.
3	1	0.059000	0.092000	2	0.
4	1	0.151000	0.27072	2	0.

Thermal Conductor Type 15 739 Steel					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	8	0.00	0.0090	2	0.
2	1	0.0090	0.050000	2	0.
3	1	0.059000	0.101000	2	0.
4	1	0.160000	0.201000	1	0.
5	1	0.361000	0.38983	1	0.

Thermal Conductor Type 16 1.7" Steel					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	8	0.0	0.0090	2	0.
2	1	0.0090	0.050000	2	0.
3	1	0.059000	0.100000	2	0.
4	1	0.159000	0.202000	1	0.
5	1	0.361000	0.403000	1	0.
6	1	0.764000	0.923400	1	0.

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Thermal Conductor Type 17 Stainless 0.024					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	6	0.0000	0.024000	2	0.

Materials	
Type #	Description
1	Carbon Steel
2	Concrete
3	Paint 1 (bottom coat)
4	Paint 2 (top coat)
5	Paint Film
6	Stainless Steel
7	Zinc
8	Paint on Misc. Steel
9	304 Type Stainless Steel

Material Type 1 Carbon Steel			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	489.	25.9	0.10955
1000.	489.	25.9	0.10955

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Material Type 2 Concrete			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	115.	1.	0.2774
1000.	115.	1.	0.2774

Material Type 3 Paint 1 (bottom coat)			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	68.64	0.083	0.286
1000.	68.64	0.083	0.286

Material Type 4 Paint 2 (top coat)			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	68.64	1.5	0.1919
1000.	68.64	1.5	0.1919

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Material Type 5 Paint Film			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	68.64	0.156	0.4079
1000.	68.64	0.156	0.4079

Material Type 6 Stainless Steel			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	490.	9.8	0.11
1000.	490.	9.8	0.11

Material Type 7 Zinc			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	446.	64.	0.091
1000.	446.	64.	0.091

Material Type 8 Paint on Misc. Steel			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	68.64	0.235	0.558
1000.	68.64	0.235	0.558

Material Type 9 304 Type Stainless Steel			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	487.8	8.99	0.11
1000.	487.8	8.99	0.11

Cooler/Heater										
Heater Cooler #	Description	Vol. #	On Trip #	Off Trip #	Flow Rate (CFM)	Flow Rate FF	Heat Rate (Btu/s)	Heat Rate FF	Phs Opt	Ct L
1C	Cooler	1	1		90000.	0	2.	4	VTS	

Heat Exchangers - Table 1				
Heat Ex. #	Description	HX Type #	Flow Path #	Secon-dary HX #
1H	SDC HX	1	5	

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Heat Exchangers - Table 2

Heat Ex. #	Scndy Flow (lbm/s)	Scnd Flow FF	Scndy Temp (F)	Scnd Temp FF	Ext. Flow (lbm/s)	Ext. Flow FF	Ext. Heat (Btu/s)	Ext. Heat FF
1H	410.9		112.		0.		0.	

Heat Exchanger Types - Table 1

HX Type #	Option	Passes or Zones	Tube Mat. Type #	Thick-ness (in)	Wall Area (ft2)
1	TUBE-SHELL	1	9	0.049	7000.

Heat Exchanger Types - Table 2

HX Type #	Side	Fin Type	Flow Area (ft2)	Hyd. Diam. (in)	Tot. S. Area (ft2)	H.T. Coef Curv	H.T. Coef Type	Fouling Resistance (h-f2-F/B)
1	PRIM	NONE	1.718	0.6485	6053.	6	TIME	
	seco	NONE	8.066	2.44	7000.	7	TIME	

Heat Exchanger Types - Table 3
Fin Parameters

HX Type #	Side	Fin Mat. Type #	Pin Diam. (in)	Length (in)	Thick-ness (in)	Surf. Area (ft2)
1	prim	0	0.	0.	0.	0.
	SECO	0	0.	0.	0.	0.

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Spray Nozzles

Nozzle #	Description	Flow Path #	Dis. Vol. #	Drop Dia. (in.)	Drop Dia. FF	Spray Flow Frac.	Flow Frac. FF
1N	RCB Spray:RAS	5	1	0.0276		1.	

Component Trips

Trip #	Sense Var.	Sensor 1 Loc.	Sensor 2 Loc.	Var. Limit	Set Point	Delay Time	Rset Trip	Cond Trip	Cond Type
1	PRESS	1	-	UPPER	19.7	10	-	-	AND
2	PRESS	1		UPPER	19.7	1			AND

Functions

FF#	Description	Ind. Var.	Dep. Var.	Points
0	Constant	-	-	0
1	Blowdown Flow	Time (Sec)	Flow (lb/s	48
2	Blowdown Enthal	Time	Enthalpy (	49
3	RCS Pressure Ps	Time	RCS Pressu	21
4	CFC Cooling	RCB Temp.	CFC Heat T	8
5	Pre-RAS CS Cont	Time(sec)	CS On/Off	12
6	SDCHX Tube h	Time(s)	h (BTU/hrf	4
7	SDCHX Shell h	Time(s)	h (BTU/hrf	4
8	LT Liq. Flow To	Time (s)	Liquid to	153
9	LT Liq. Flow En	Time (s)	Enthalpy (	153
10	CS Flow Fractio	Time(s)	Flow On/Of	4
11	Post-RAS Sump L	Time (s)	Flow (lbm/	67
12	LT Steam Mass R	Time(sec)	lb/sec	155
13	LT Steam Enthal	Time(s)	Btu/lb	155
14	SIT Nitrogen	Time (sec)	Flow (lb/s	16

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Function 1 Blowdown Flow Ind. Var.: Time (Sec) Dep. Var.: Flow (lb/s)			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	0.5	104850.
1.	79865.	1.5	71647.
2.	70756.	2.5	67890.
3.	61715.	4.	50496.
5.	45268.	6.	37947.
7.	22092.	8.	14321.
9.	9539.2	10.	8709.4
11.	4933.2	12.	2649.6
12.1	2533.5	12.2	2731.6
12.3	3020.5	12.4	3689.7
12.5	4110.1	12.6	4319.2
12.7	4386.2	12.8	4405.9
12.9	4406.4	13.	4349.8
13.1	4254.4	13.2	4096.1
13.3	3846.1	13.4	3586.4
13.5	3314.6	13.6	3015.9
13.7	2782.1	13.8	2555.4
13.9	2348.1	14.	2163.5
14.1	1975.4	14.2	1738.7
14.3	1536.6	14.4	1392.3
14.5	1239.2	14.6	1065.9
14.7	928.18	14.8	780.31
14.9	620.86	15.	502.23
15.01	0.	1000000.	0.

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Function
2
Blowdown Enthalpy
Ind. Var.: Time
Dep. Var.: Enthalpy (BTU/lb)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	625.1	0.5	625.1
1.	631.5	1.5	620.39
2.	603.55	2.5	595.33
3.	607.05	4.	632.92
5.	628.96	6.	634.7
7.	782.87	8.	945.1
9.	990.85	10.	918.93
11.	1086.33	12.	1212.35
12.1	1217.16	12.2	1223.06
12.3	1172.88	12.4	945.07
12.5	855.1	12.6	816.61
12.7	791.53	12.8	773.87
12.9	760.56	13.	753.05
13.1	757.55	13.2	773.9
13.3	796.4	13.4	825.13
13.5	882.04	13.6	929.32
13.7	970.36	13.8	1017.13
13.9	1061.13	14.	1100.85
14.1	1145.41	14.2	1199.32
14.3	1212.79	14.4	1218.22
14.5	1224.88	14.6	1228.75
14.7	1231.51	14.8	1233.57
14.9	1233.34	15.	1231.33
15.01	1231.33	15.11	100.
1000000.	100.		

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Function 3 RCS Pressure Psia Ind. Var.: Time Dep. Var.: RCS Pressure (psia)			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	2315.	0.5	913.5
1.	716.63	1.5	632.66
2.	599.06	2.5	571.56
3.	543.7	4.	497.04
5.	443.13	6.	385.3
7.	323.51	8.	266.7
9.	188.1	10.	153.66
11.	113.65	12.	72.6
13.	78.26	14.	64.34
15.	55.22	15.1	20.
1000000.	20.		

Function 4 CFC Cooling Ind. Var.: RCB Temp. (F) Dep. Var.: CFC Heat Tfer(BTU/s)			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
20.	0.	129.99	0.
130.	1376.6	150.	3392.13
200.	10582.	251.	19751.
261.	21590.	1000000.	21590.

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Function
5
Pre-RAS CS Control
Ind. Var.: Time(sec)
Dep. Var.: CS On/Off

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	31.56	0.
31.57	0.169789	35.57	0.169789
35.58	0.328612	38.27	0.328612
38.28	0.407424	39.21	0.407424
39.22	1.	1823.58	1.
1823.59	0.	1000000.	0.

Function
6
SDCHX Tube h
Ind. Var.: Time(s)
Dep. Var.: h (BTU/hrft2F)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	1823.57	0.
1823.58	855.65	1000000.	855.65

Function
7
SDCHX Shell h
Ind. Var.: Time(s)
Dep. Var.: h (BTU/hrft2F)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	1823.57	0.
1823.58	1344.15	1000000.	1344.15

Function
8
LT Liq Flow To Sump
Ind. Var.: Time (s)
Dep. Var.: Liquid to Sump (lb/s)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.

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Function
8
LT Liq. Flow To Sump
Ind. Var.: Time (s)
Dep. Var.: Liquid to Sump (lb/s)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	18.5033	0.
18.5533	733.648	18.6033	664.473
18.6533	667.718	18.7033	667.713
18.7533	667.852	18.8033	711.839
18.8533	709.989	18.9033	710.209
18.9533	710.335	19.0033	710.464
19.0533	710.591	19.1033	710.718
19.1533	710.844	19.2033	710.969
19.2533	711.094	19.3033	711.218
19.3533	711.341	19.4033	711.464
19.4533	711.586	19.5033	711.707
19.5533	711.828	19.6033	711.949
19.6533	712.069	19.7033	712.188
19.7533	712.307	19.8033	712.426
19.8533	712.544	19.9033	712.662
19.9533	712.779	19.9533	712.779
20.0033	712.895	20.0533	713.002
20.1033	713.109	20.1533	713.215
20.2033	713.321	20.2533	713.427
20.3033	713.532	20.3533	713.637
20.4033	713.742	20.4533	713.846
20.5033	713.951	20.5533	714.054
20.6033	714.158	20.6533	714.262
20.7033	714.365	20.7533	714.468
20.8033	714.57	20.8533	714.673
20.9033	714.775	20.9533	714.877
21.0033	714.979	36.1033	1114.79
51.2033	1172.48	66.3033	1221.98
81.4033	1229.03	96.5033	1237.11
111.603	1241.33	126.703	1245.96
141.803	1327.95	156.953	1397.79
172.053	1401.37	187.153	1404.53
202.253	1407.3	217.353	1409.57
232.453	1411.73	247.553	1413.79
262.653	1415.56	277.803	1417.2
292.903	1418.78	308.003	1420.05
323.103	1421.2	338.203	1422.33
353.303	1423.42	368.403	1424.42
383.503	1425.41	398.603	1426.38
413.753	1427.27	428.853	1428.14
443.953	1429.	459.053	1429.81
474.153	1430.59	489.253	1431.34

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Function 8 LT Liq. Flow To Sump Ind. Var.: Time (s) Dep. Var.: Liquid to Sump (lb/s)			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
587.003	1435.6	889.003	1445.2
1192.	1451.44	1494.	1456.08
1796.	1459.98	2196.	180.846
2798.	185.428	3402.	188.885
4006.	191.555	4610.	193.662
5216.	195.374	5820.	196.833
6424.	198.055	7028.	199.154
7632.	200.056	8236.	200.894
8840.	201.64	9444.	202.309
10000.	202.893	10514.	202.968
11028.	203.015	11544.	203.054
12056.	203.118	12572.	203.436
13086.	203.766	13600.	204.102
14114.	204.428	14628.	204.713
15144.	204.997	15658.	205.28
16172.	205.551	16686.	205.798
17200.	206.044	17716.	206.291
18228.	206.522	18744.	206.735
19258.	206.945	19774.	207.157
22860.	208.229	28000.	209.762
33160.	210.984	38300.	211.992
43440.	212.86	48580.	213.62
53740.	214.265	58880.	214.873
64000.	215.408	69160.	215.925
74300.	216.371	79460.	216.803
84580.	217.182	89740.	217.557
94880.	216.83	100020.	216.033
132000.	217.621	164000.	218.788
196000.	219.676	228000.	220.356
260000.	220.977	292000.	221.514
360000.	222.407	440000.	223.616
520000.	224.883	600000.	225.895
680000.	226.77	760000.	227.564
840000.	228.288	920000.	228.945
1000000.	229.528		

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Function 9 LT Liq. Flow Enthalpy Ind. Var.: Time (s) Dep. Var.: Enthalpy (Btu/lbm)			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	100.	18.5033	100.
18.5533	67.9716	18.6033	67.9716
18.6533	67.9716	18.7033	67.9716
18.7533	67.9716	18.8033	67.9716
18.8533	67.9716	18.9033	67.9716
18.9533	67.9716	19.0033	67.9716
19.0533	67.9716	19.1033	67.9716
19.1533	67.9716	19.2033	67.9716
19.2533	67.9716	19.3033	67.9716
19.3533	67.9716	19.4033	67.9716
19.4533	67.9716	19.5033	67.9716
19.5533	67.9716	19.6033	67.9716
19.6533	67.9716	19.7033	67.9716
19.7533	67.9716	19.8033	67.9716
19.8533	67.9716	19.9033	67.9716
19.9533	67.9716	19.9533	67.9716
20.0033	67.9716	20.0533	67.9716
20.1033	67.9716	20.1533	67.9716
20.2033	67.9716	20.2533	67.9716
20.3033	67.9716	20.3533	67.9716
20.4033	67.9716	20.4533	67.9716
20.5033	67.9716	20.5533	67.9716
20.6033	67.9716	20.6533	67.9716
20.7033	67.9716	20.7533	67.9716
20.8033	67.9716	20.8533	67.9716
20.9033	67.9716	20.9533	67.9716
21.0033	67.9716	36.1033	67.9716
51.2033	67.9716	66.3033	67.9716
81.4033	67.9716	96.5033	67.9716
111.603	67.9716	126.703	67.9716
141.803	67.9716	156.953	67.9716
172.053	67.9716	187.153	67.9716
202.253	67.9716	217.353	67.9716
232.453	67.9716	247.553	67.9716
262.653	67.9716	277.803	67.9716
292.903	67.9716	308.003	67.9716
323.103	67.9716	338.203	67.9716
353.303	67.9716	368.403	67.9716
383.503	67.9716	398.603	67.9716
413.753	67.9716	428.853	67.9716
443.953	67.9716	459.053	67.9716
474.153	67.9716	489.253	67.9716

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Function 9 LT Liq. Flow Enthalpy Ind. Var.: Time (s) Dep. Var.: Enthalpy (Btu/lbm)			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
587.003	67.9716	889.003	67.9716
1192.	67.9716	1494.	67.9716
1796.	67.9716	2196.	96.434
2798.	98.0385	3402.	99.3502
4006.	100.449	4610.	101.39
5216.	102.21	5820.	102.927
6424.	103.561	7028.	104.124
7632.	104.626	8236.	105.076
8840.	105.479	9444.	105.84
10000.	106.14	10514.	106.393
11028.	106.629	11544.	106.853
12056.	107.064	12572.	107.265
13086.	107.45	13600.	107.621
14114.	107.778	14628.	107.921
15144.	108.052	15658.	108.17
16172.	108.278	16686.	108.374
17200.	108.461	17716.	108.539
18228.	108.607	18744.	108.668
19258.	108.721	19774.	108.767
22860.	108.915	28000.	108.81
33160.	108.444	38300.	107.952
43440.	107.407	48580.	106.85
53740.	106.303	58880.	105.788
64000.	105.302	69160.	104.845
74300.	104.421	79460.	104.028
84580.	103.666	89740.	103.329
94880.	103.094	100020.	103.053
132000.	102.602	164000.	101.783
196000.	101.1	228000.	100.569
260000.	100.115	292000.	99.7267
360000.	99.0619	440000.	98.3155
520000.	97.4082	600000.	96.7085
680000.	96.0956	760000.	95.5422
840000.	95.0393	920000.	94.5838
1000000.	94.1838		

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Function 10 CS Flow Fraction From Sump Ind. Var.: Time(s) Dep. Var.: Flow On/Off			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	1823.57	0.
1823.58	1.	1000000.	1.

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Function 11 Post-RAS Sump Liq. Removal Ind. Var.: Time (s) Dep. Var.: Flow (lbm/s)			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	1823.57	0.
1823.58	-238.64	2196.	-238.64
2798.	-238.64	3402.	-238.64
4006.	-238.64	4610.	-238.64
5216.	-238.64	5820.	-238.64
6424.	-238.64	7028.	-238.64
7632.	-238.64	8236.	-238.64
8840.	-238.64	9444.	-238.64
10000.	-238.64	10514.	-238.64
11028.	-238.64	11544.	-238.64
12056.	-238.64	12572.	-238.64
13086.	-238.64	13600.	-238.64
14114.	-238.64	14628.	-238.64
15144.	-238.64	15658.	-238.64
16172.	-238.64	16686.	-238.64
17200.	-238.64	17716.	-238.64
18228.	-238.64	18744.	-238.64
19258.	-238.64	19774.	-238.64
22860.	-238.64	28000.	-238.64
33160.	-238.64	38300.	-238.64
43440.	-238.64	48580.	-238.64
53740.	-238.64	58880.	-238.64
64000.	-238.64	69160.	-238.64
74300.	-238.64	79460.	-238.64
84580.	-238.64	89740.	-238.64
94880.	-238.64	100020.	-238.64
132000.	-238.64	164000.	-238.64
196000.	-238.64	228000.	-238.64
260000.	-238.64	292000.	-238.64
360000.	-238.64	440000.	-238.64
520000.	-238.64	600000.	-238.64
680000.	-238.64	760000.	-238.64
840000.	-238.64	920000.	-238.64
1000000.	-238.64		

Function 12 LT Steam Mass Release Ind. Var.: Time(sec) Dep. Var.: lb/sec			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.

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Function 12 LT Steam Mass Release Ind. Var.: Time(sec) Dep. Var.: lb/sec			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	15.0033	0.
15.0533	2830.1	18.5033	2376.68
18.5533	786.912	18.6033	856.087
18.6533	852.842	18.7033	852.847
18.7533	852.708	18.8033	808.721
18.8533	810.571	18.9033	810.351
18.9533	810.225	19.0033	810.096
19.0533	809.969	19.1033	809.842
19.1533	809.716	19.2033	809.591
19.2533	809.466	19.3033	809.342
19.3533	809.219	19.4033	809.096
19.4533	808.974	19.5033	808.853
19.5533	808.732	19.6033	808.611
19.6533	808.491	19.7033	808.372
19.7533	808.253	19.8033	808.134
19.8533	808.016	19.9033	807.898
19.9533	807.781	19.9533	807.781
20.0033	807.665	20.0533	807.558
20.1033	807.451	20.1533	807.345
20.2033	807.239	20.2533	807.133
20.3033	807.028	20.3533	806.923
20.4033	806.818	20.4533	806.714
20.5033	806.609	20.5533	806.506
20.6033	806.402	20.6533	806.299
20.7033	806.195	20.7533	806.092
20.8033	805.99	20.8533	805.887
20.9033	805.785	20.9533	805.683
21.0033	805.581	36.1033	405.767
51.2033	348.08	66.3033	298.58
81.4033	291.527	96.5033	283.449
111.603	279.23	126.703	274.599
141.803	192.613	156.953	122.773
172.053	119.194	187.153	116.025
202.253	113.258	217.353	110.986
232.453	108.827	247.553	106.769
262.653	105.003	277.803	103.356
292.903	101.783	308.003	100.512
323.103	99.3631	338.203	98.2309
353.303	97.137	368.403	96.1375
383.503	95.1533	398.603	94.1836
413.753	93.29	428.853	92.4194
443.953	91.5618	459.053	90.7495

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Function 12 LT Steam Mass Release Ind. Var.: Time(sec) Dep. Var.: lb/sec			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
474.153	89.9711	489.253	89.2188
587.003	84.9591	889.003	75.3557
1192.	69.1221	1494.	64.484
1796.	60.5766	2196.	57.7945
2798.	53.2124	3402.	49.7551
4006.	47.0855	4610.	44.9777
5216.	43.2659	5820.	41.8073
6424.	40.5845	7028.	39.4859
7632.	38.584	8236.	37.7458
8840.	36.9996	9444.	36.3315
10000.	35.7471	10514.	35.6719
11028.	35.6248	11544.	35.5861
12056.	35.5217	12572.	35.2046
13086.	34.8739	13600.	34.5385
14114.	34.2122	14628.	33.9273
15144.	33.6432	15658.	33.3604
16172.	33.0888	16686.	32.8416
17200.	32.5955	17716.	32.3486
18228.	32.1178	18744.	31.9053
19258.	31.6946	19774.	31.4832
22860.	30.4106	28000.	28.8777
33160.	27.656	38300.	26.6478
43440.	25.7798	48580.	25.0203
53740.	24.375	58880.	23.7673
64000.	23.2322	69160.	22.7148
74300.	22.269	79460.	21.8371
84580.	21.458	89740.	21.0833
94880.	21.8096	100020.	22.6068
132000.	21.0193	164000.	19.8519
196000.	18.9635	228000.	18.2838
260000.	17.6629	292000.	17.1264
360000.	16.2329	440000.	15.0243
520000.	13.7573	600000.	12.7447
680000.	11.8705	760000.	11.0761
840000.	10.3518	920000.	9.69528
1000000.	9.11197		

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Function 13 LT Steam Enthalpy Ind. Var.: Time(s) Dep. Var.: Btu/lb			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	100.	15.0033	100.
15.0533	1173.32	18.5033	1168.79
18.5533	1173.66	18.6033	1173.66
18.6533	1173.65	18.7033	1173.65
18.7533	1173.65	18.8033	1173.65
18.8533	1173.65	18.9033	1173.65
18.9533	1173.65	19.0033	1173.65
19.0533	1173.64	19.1033	1173.64
19.1533	1173.64	19.2033	1173.64
19.2533	1173.64	19.3033	1173.64
19.3533	1173.64	19.4033	1173.64
19.4533	1173.63	19.5033	1173.63
19.5533	1173.63	19.6033	1173.63
19.6533	1173.63	19.7033	1173.63
19.7533	1173.63	19.8033	1173.63
19.8533	1173.63	19.9033	1173.62
19.9533	1173.62	19.9533	1173.62
20.0033	1173.62	20.0533	1173.62
20.1033	1173.62	20.1533	1173.62
20.2033	1173.62	20.2533	1173.62
20.3033	1173.61	20.3533	1173.61
20.4033	1173.61	20.4533	1173.61
20.5033	1173.61	20.5533	1173.61
20.6033	1173.61	20.6533	1173.61
20.7033	1173.61	20.7533	1173.61
20.8033	1173.6	20.8533	1173.6
20.9033	1173.6	20.9533	1173.6
21.0033	1173.6	36.1033	1173.32
51.2033	1172.76	66.3033	1172.26
81.4033	1171.82	96.5033	1171.48
111.603	1171.17	126.703	1170.9
141.803	1170.62	156.953	1170.3
172.053	1169.96	187.153	1169.64
202.253	1169.35	217.353	1169.07
232.453	1168.81	247.553	1168.57
262.653	1168.34	277.803	1168.12
292.903	1167.91	308.003	1167.71
323.103	1167.51	338.203	1167.33
353.303	1167.14	368.403	1166.96
383.503	1166.79	398.603	1166.63
413.753	1166.46	428.853	1166.31
443.953	1166.15	459.053	1166.

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Function 13 LT Steam Enthalpy Ind. Var.: Time(s) Dep. Var.: Btu/lb			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
474.153	1165.86	489.253	1165.72
587.003	1164.89	889.003	1162.98
1192.	1161.66	1494.	1160.6
1796.	1159.75	2196.	1159.05
2798.	1158.31	3402.	1157.79
4006.	1157.42	4610.	1157.14
5216.	1156.93	5820.	1156.75
6424.	1156.61	7028.	1156.49
7632.	1156.39	8236.	1156.29
8840.	1156.22	9444.	1156.14
10000.	1156.08	10514.	1156.05
11028.	1156.02	11544.	1156.01
12056.	1156.	12572.	1155.97
13086.	1155.95	13600.	1155.92
14114.	1155.89	14628.	1155.86
15144.	1155.83	15658.	1155.8
16172.	1155.78	16686.	1155.75
17200.	1155.73	17716.	1155.71
18228.	1155.69	18744.	1155.67
19258.	1155.65	19774.	1155.63
22860.	1155.53	28000.	1155.39
33160.	1155.28	38300.	1155.19
43440.	1155.11	48580.	1155.04
53740.	1154.98	58880.	1154.93
64000.	1154.89	69160.	1154.84
74300.	1154.8	79460.	1154.77
84580.	1154.74	89740.	1154.71
94880.	1154.75	100020.	1154.8
132000.	1154.69	164000.	1154.6
196000.	1154.53	228000.	1154.47
260000.	1154.43	292000.	1154.38
360000.	1154.32	440000.	1154.23
520000.	1154.13	600000.	1154.05
680000.	1153.99	760000.	1153.93
840000.	1153.88	920000.	1153.83
1000000.	1153.79		

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Function 14 SIT Nitrogen Ind. Var.: Time (sec) Dep. Var.: Flow (lb/sec)			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	91.75	0.
91.755	253.96	92.25	228.82
92.75	204.66	93.25	181.61
93.75	159.5	94.25	138.21
94.75	117.62	95.25	97.61
95.75	78.01	96.25	58.67
96.75	39.39	97.25	19.67
97.75	0.	1000000.	0.

Control Variables							
CV #	Description	Type	Initial Value	Coeff. G	Coeff. a0	Min	Max
1	Hx and CFC He	sum	0.	1.	0.	-1e+03	1e+032
2	Total Heat Re	integ	0.	1.	0.	-1e+03	1e+032

Control Variable # Hx and CFC Heat Load sum Y=G*(a0+a1X1+a2X2+...+anXn)			
#	Gothic_s Name	Variable location	Coef. a
1	qhxa(1)	cX1H	1.
2	htq	cH1C	1.

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Control Variable # Total Heat Removal integ Y=G*integ((a0+a1X1)dt)			
#	Gothic_s Name	Variable location	Coef. a
1	cvval	cv1	1.

Volume Initial Conditions							
Vol #	Pressure (psia)	Vapor Temp. (F)	Liquid Temp. (F)	Relative Humidity (%)	Liquid Volume Fractio	Ice Volume Fracti	Ice Surf. A (ft2)
def	15.7	120.	120.	50.	0.	0.	0.

Initial Gas Pressure Ratios								
Vol #	Air Gas 1	N2 Gas 2	Gas 3	Gas 4	Gas 5	Gas 6	Gas 7	Gas 8
def	1.	0.	0.	0.	0.	0.	0.	0.

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Run Control Parameters (Seconds)								
Time Int	DT Min	DT Max	DT Ratio	End Time	Print Int	Graph Int	Max CPU	Dump Int
1	0.001	0.01	1.	0.5	1e+007	0.1	2500.	0.
2	0.001	0.1	1.	10.	1e+007	0.5	1000.	0.
3	0.01	0.1	1.	20.	1e+007	0.25	2000.	0.
4	0.01	0.25	1.	270.	1e+007	2.	2000.	0.
5	0.01	0.25	1.	330.	1e+007	0.5	3000.	0.
6	0.01	0.5	1.	1520.	1e+007	30.	2000.	0.
7	0.01	0.5	1.	1600.	1e+007	10.	3000.	0.
8	0.01	1.	1.	10000.	1e+007	150.	25000.	0.
9	0.01	1.5	1.	87000.	1e+007	500.	90000.	0.
10	0.01	5.	1.	1e+006	1e+007	1800.	90000.	0.

Run Parameters Menu	
Parameter	Value
Restart Time (sec)	0
Restart Time Step #	0
Restart Time Control	NEW
Revap. Fraction	1e-006
Hetero. Nucleation?	YES
Min. NC HT Coeff. (Btu/ft2-hr-F)	0
Reference Pressure (psia)	0
Forced Ent. Drop Dia. (ft)	0.00833
Vaper Phase Head Cor.?	NO
Solution Method	DIRECT
Include Kinetic Energy?	NO

Ice Condenser Parameters			
Initial Temp. (F)	Bulk Density (lbm/ft3)	Surface Area Multiplier Function	Heat Transfer Option
0.	0.		UCHIDA

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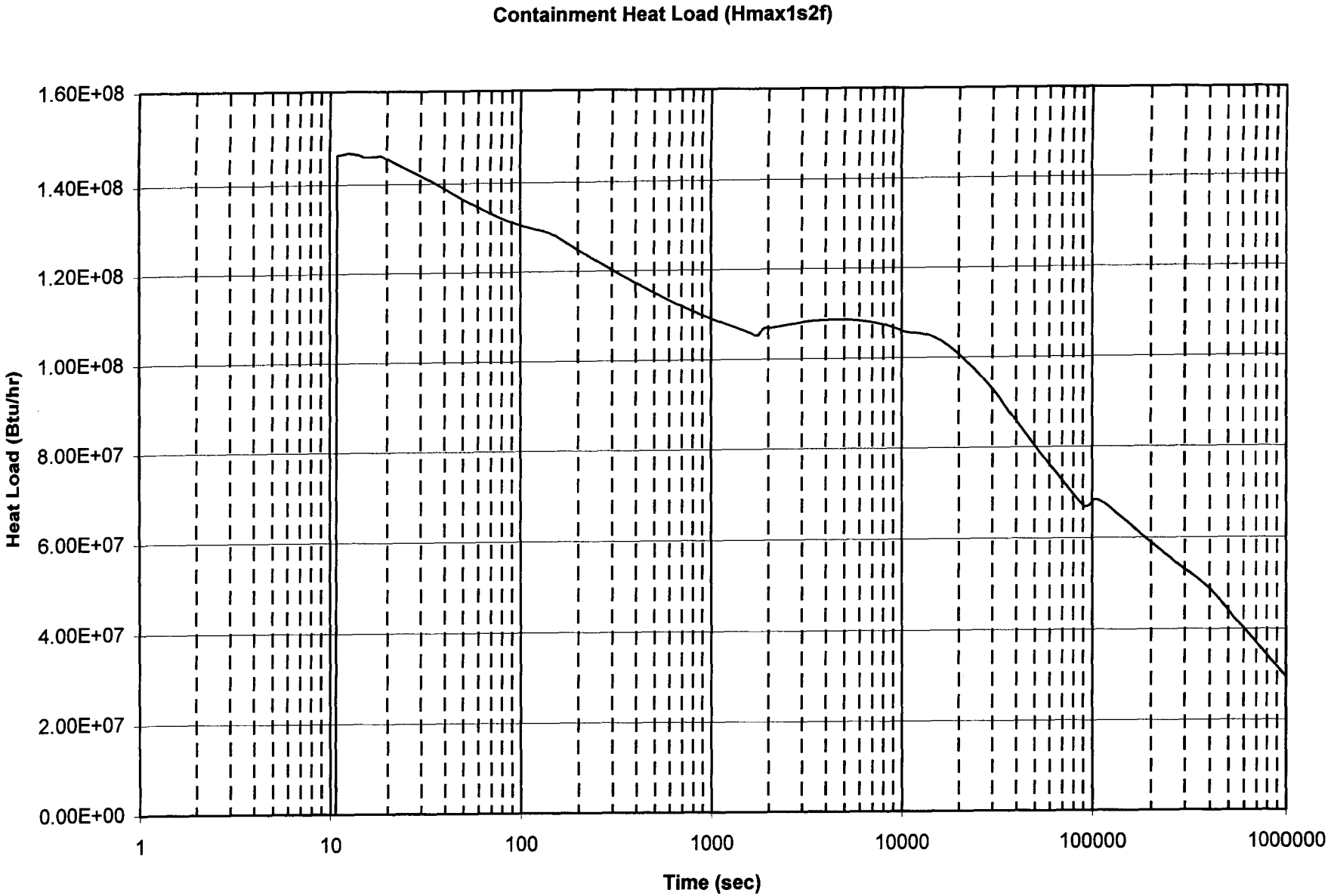
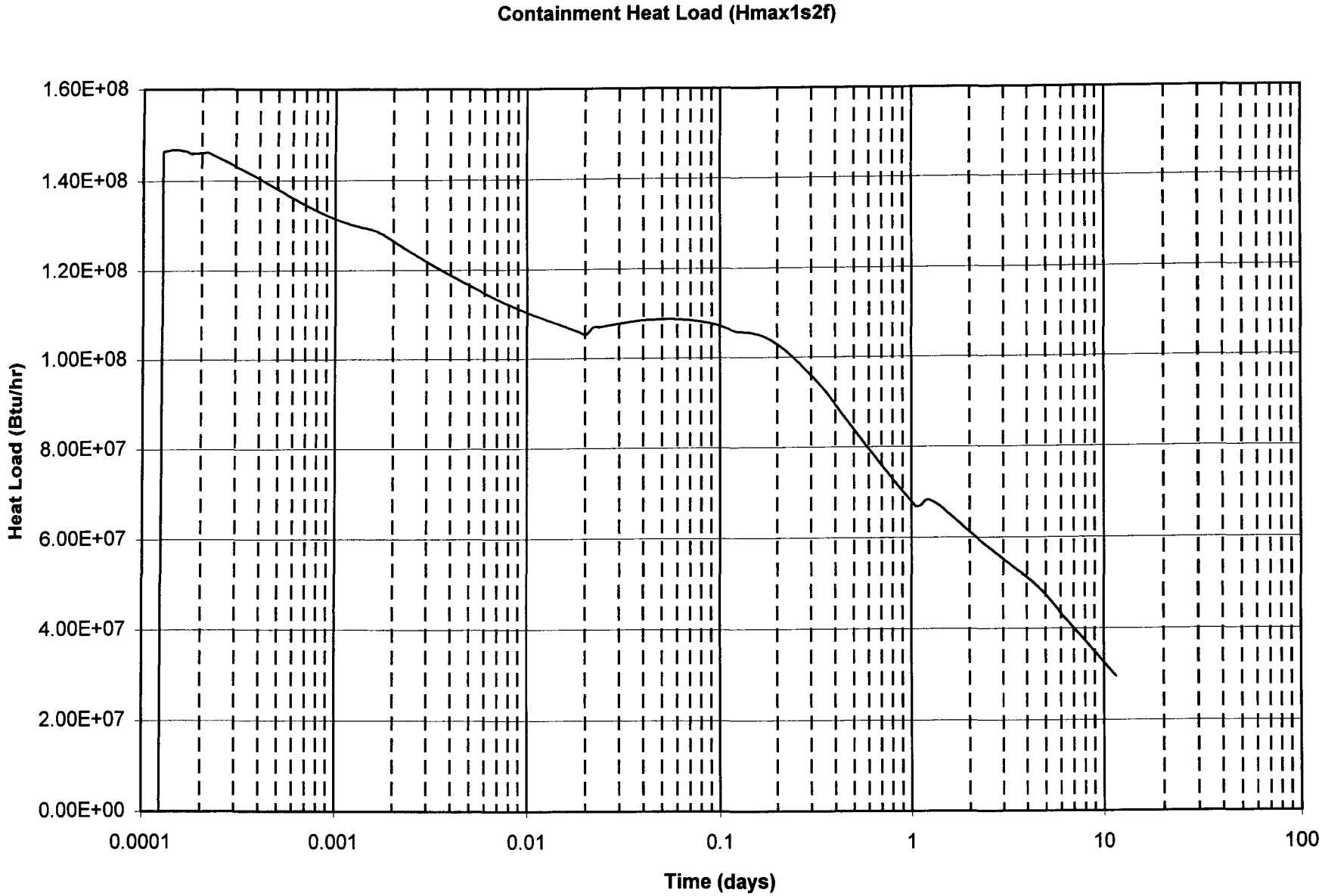
Graphs							
Graph #	Title	Mon	Curve Number 1	2	3	4	5
1	Figure 1: Cont.		PR1				
2	Figure 2: Cont.		TV1	TL2			
3	SDCHX Parameter		T11H	t11H	T21H	t21H	
4	Figure 3: Condu		TA1	TA4	TA6	TA16	
5	Figure 4: Therm		HA1	hA4	HA6	HA16	
6	Pressure Fracti		1R1	9R1			
7	Figure 5: Blowd		FV2	FV8	FL6		
8	Spray Flows		FD3	FL5			
9	Sump Liquid Lev		LL1	LL2			
10	Figure 6: SDC H		xq1H	CQ1C			
11	Total Heat Load		cv1				
12	Total Heat Load		cv1	cv2			

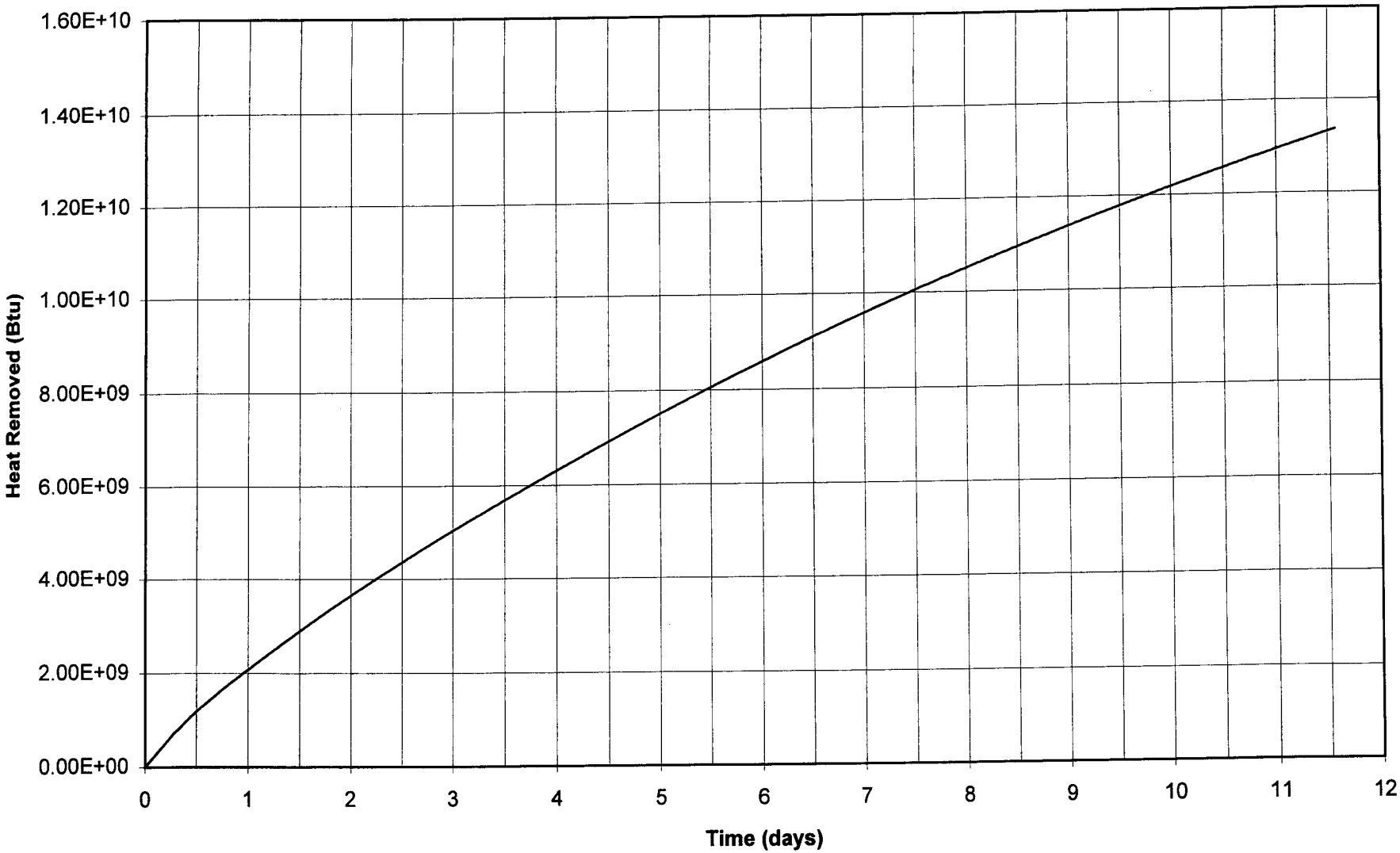
Noncondensing Gases						
Gas No.	Description	Symbol	Type	Mol. Weight	Lennard-Jones Parameters Diameter (Ang)	e/K (K)
1	Air	Air	POLY	28.97	3.617	97.
2	Nitrogen	N2	POLY	28.02	3.681	91.5

Noncondensing Gases - Cp/Visc. Equations						
Gas No.	Cp Equation (Required) Tmin (R)	Tmax (R)	Cp (Btu/lbm-R)	Visc. Equation (Optional) Tmin (R)	Tmax (R)	Viscosity (lbm/ft-hr)
1	360.	2880.	0.238534-6.2006			
2	180.	5400.	0.413186-8.7659			


Containment Heat Load (Hmax1s2f)
Heat Load (Btu/hr)
1.60E+08
1.40E+08
1.20E+08
1.00E+08
8.00E+07
6.00E+07
4.00E+07
2.00E+07
0.00E+00
1
10
100
1000
10000
100000
1000000
Time (sec)


Containment Heat Load (Hmax1s2f)
Heat Load (Btu/hr)
1.60E+08
1.40E+08
1.20E+08
1.00E+08
8.00E+07
6.00E+07
4.00E+07
2.00E+07
0.00E+00
0.0001
0.001
0.01
0.1
1
10
100
Time (days)

Integrated Containment Heat Load (Hmax1s2f)



Attachment II

Hmin1s2f

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Control Volumes

Vol #	Description	Vol (ft3)	Elev (ft)	Ht (ft)	Hyd. D. (ft)	L/V IA (ft)	Burn Opt
1	RCB Atmosphere	2580000.	35.	208.	70.	DEFAULT	NONE
2	RCB Sump	97000.	19.	16.	5.	15000	NONE

Fluid Boundary Conditions - Table 1

BC#	Description	Press. (psia)	FF	Temp. (F)	FF	Flow (lbm/s)	FF	On Trip	Off Trip
1F	Blowdown Flow	1.	3	E1.0	2	1.0	1	0	
2F	Spray: pre-RAS	14.7	0	100.00		242.17	5	2	
3F	Sump Suction	14.7				v-4.010	10	0	
4C	Spray: Recirc	14.7						0	
5F	Long Term Liqui	14.7		E1.0	9	1.0	8		
6F	Sump Liquid Rem	14.7		0	0	1.0	11		
7F	Long Term Relea	1.	3	E1.0	13	1.0	12	0	
8F	SIT Nitrogen	100.	0	120	0	1.0	14	0	

Fluid Boundary Conditions - Table 2

BC#	Liq. V. Frac.	FF	Stm. P.R.	FF	Drop D (in)	FF	Cpld BC#	Flow Frac.	FF	Heat (Btu/s)	FF	Outlet Quality
1F	0.		1.0000		0.0039	0						DEFAULT
2F	1.		1.0000		0.0276							DEFAULT
3F	1.		1.0000		NONE							DEFAULT
4C	1.		1.0000		NONE		3F	1.		0.		DEFAULT
5F	1.		1.0000		NONE							DEFAULT
6F	1.		1.0000		NONE							DEFAULT
7F	0.		1.0000		0.0039	0						DEFAULT
8F	0.		0		NONE	0						DEFAULT

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Fluid Boundary Conditions - Table 3 Gas Pressure Ratios								
BC#	Air Gas 1	FF	N2 Gas 2	FF	Gas 3	FF	Gas 4	FF
1F	0.		0.		0.		0.	
2F	0.		0.		0.		0.	
3F	0.		0.		0.		0.	
4C	0.		0.		0.		0.	
5F	0.		0.		0.		0.	
6F	0.		0.		0.		0.	
7F	0.		0.		0.		0.	
8F	0.		1.		0.		0.	

Fluid Boundary Conditions - Table 4 Gas Pressure Ratios								
BC#	Gas 5	FF	Gas 6	FF	Gas 7	FF	Gas 8	FF
1F	0.		0.		0.		0.	
2F	0.		0.		0.		0.	
3F	0.		0.		0.		0.	
4C	0.		0.		0.		0.	
5F	0.		0.		0.		0.	
6F	0.		0.		0.		0.	
7F	0.		0.		0.		0.	
8F	0.		0.		0.		0.	

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Flow Paths - Table 1

F.P. #	Description	Vol A	Elev (ft)	Ht (ft)	Vol B	Elev (ft)	Ht (ft)
1	RCB Open Space	1	35.15	0.35	2	34.89	0.1
2	Blowdown Flow	1	47.125	2.5	1F	47.125	2.5
3	Spray:pre-RAS	1	220.	0.5	2F	220.	0.5
4	Sump Suction Fl	2	20.75	2.	3F	20.75	2.
5	Spray: Recirc	1	220.	0.5	4C	220.	0.5
6	Liq.to Sump	2	20.75	2.5	5F	20.75	2.5
7	Liq From sump	2	20.75	2.5	6F	20.75	2.5
8	Long Term Flow	1	47.125	2.5	7F	47.125	2.5
9	SIT Nitrogen	1	47.125	2.5	8F	47.125	2.5

Flow Paths - Table 2

Flow Path #	Flow Area (ft2)	Hyd. Diam. (ft)	Inertia Length (ft)	Friction Length (ft)	De-Entrmt Frac.	Mom Trn Opt
1	10000.	15.	112.	0.25	0.	-
2	9.817	2.5	10.	0.		-
3	0.4481	0.7553	200.	0.		-
4	3.14	2.	25.	0.		-
5	0.4481	0.7553	200.	0.		-
6	9.817	2.5	10.	0.		-
7	1000.	15.	10.	0.		-
8	9.817	2.5	10.	0.		-
9	9.817	2.5	10.	0.		-

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Flow Paths - Table 3

Flow Path #	Fwd. Loss Coeff.	Rev. Loss Coeff.	Comp. Opt.	Critical Flow Model	Discharge Coeff.
1	0.01	0.01	OFF	OFF	1.
2	0.	0.	OFF	OFF	1.
3	0.	0.	OFF	OFF	1.
4	0.	0.	OFF	OFF	1.
5	0.	0.	OFF	OFF	1.
6	0.	0.	OFF	OFF	1.
7	0.	0.	OFF	OFF	1.
8	0.	0.	OFF	OFF	1.
9	0.	0.	OFF	OFF	1.

Thermal Conductors

Cond #	Description	Vol A	HT Coef	Vol B	HT Coef	Cond Type	S. A. (ft2)	Init. T.(F)	Or
1	Cont.Wall	1	1	1	2	2	61400.	120.	X
2	Base Concrete	2	3	2	2	3	15275.	120.	F
3	Cont.Dome	1	1	1	2	1	30500.	120.	X
4	Thick Sump Conc	2	3	2	2	4	5296.	120.	F
5	Thin Sump Conc.	2	3	2	2	5	3173.	120.	F
6	Thick Conc. Hi	1	1	1	2	7	9815.	120.	I
7	Thin Conc. Hi	1	1	1	2	6	47192.	120.	I
8	SS:Ref.Pool etc	1	1	1	2	8	28860.	120.	I
9	Galv.Steel 37.5	1	1	1	2	9	26266.	120.	I
10	Galv.Steel 78.3	1	1	1	2	10	153503.	120.	I
11	Galv.Steel .4"	1	1	1	2	11	9405.	120.	I
12	Misc.St. 71	1	1	1	2	12	92006.	120.	I
13	Misc.St. .16"	1	1	1	2	13	87292.5	120.	I
14	Misc.St. .41"	1	1	1	2	14	186484.	120.	I
15	Misc.St. .74"	1	1	1	2	15	30993.	120.	I
16	Misc.St. 1.7"	1	1	1	2	16	22655.	120.	I

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Thermal Conductors - Table 2

Cond #	Therm. Rad. Side A	Emiss. Side A	Therm. Rad. Side B	Emiss. Side B
1	No		No	
2	No		No	
3	No		No	
4	No		No	
5	No		No	
6	No		No	
7	No		No	
8	No		No	
9	No		No	
10	No		No	
11	No		No	
12	No		No	
13	No		No	
14	No		No	
15	No		No	
16	No		No	

Heat Transfer Coefficient Types - Table 1

Type #	Heat Transfer Option	Nominal Value	FF	Cnd Cnv Opt	Cnd Opt	Sp Cnv HTC	Nat Cnv Opt	For Cnv Opt	Rad Opt
1	Tagami		0	XOR	UCHI		VERT SURF	OFF	OFF
2	Sp Heat	0.	-		UCHI	0.0			OFF
3	Sp Conv	10.	0		-	0.0	OFF	OFF	OFF

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Heat Transfer Coefficient Types - Table 2

Type #	Phase Opt	Min Liq Fract	Max Liq Fract	Convect Bulk T Model	FF	Condensa Bulk T Model	FF
1	VAP			Tg-Tf		Tb-Tw	
2	Vecto						
3	LIQ	0.	1.	Tg-Tw			

Heat Transfer Coefficient Types - Table 3

Type #	Char. Length (ft)	Nat Coef FF	Exp FF	For Coef FF	Exp FF	Nom Vel (ft/s)	Vel FF	Minimum Conv HTC (Btu/hr-ft
1								DEFAULT
2								
3								

HTC Types - Table 4

Type #	Total Heat (Btu)	Peak Time (sec)	Initial Value (Btu/hr-ft	Post-BD Direct FF
1	320280000.	15.	0.	
2				
3				

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Thermal Conductor Types

Type #	Description	Geom	Thick. (in)	O.D. (in)	Regions	Heat (Btu/ft3-s)	Heat FF
1	Cont.Dome	TUBE	0.968	1681.936	7		
2	ContainmentWall	TUBE	1.918	1683.836	8		
3	Base Concrete	WALL	137.656	-	15		
4	Thick Conc. Lo	WALL	54.256	-	13		
5	Thin Conc. Lo	WALL	17.3680	-	12		
6	Thin Conc. Hi	WALL	19.744	-	12		
7	Thick Conc. Hi	WALL	42.616	-	13		
8	Stainless .228	WALL	0.22664	-	2		
9	Galv.St. 37.55	WALL	0.04698	-	2		
10	Galv.Steel 78.3	WALL	0.07932	-	2		
11	Galv.Steel 432.	WALL	0.4343	-	4		
12	71 Steel	WALL	0.08018	-	2		
13	164 Steel	WALL	0.17361	-	2		
14	413 Steel	WALL	0.42172	-	4		
15	739 Steel	WALL	0.75083	-	5		
16	1.7" Steel	WALL	1.6874	-	6		
17	Stainless 0.024	WALL	0.0240	-	1		

Thermal Conductor Type
1
Cont.Dome

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	4	0.000	0.007	2	0.
2	3	0.0070	0.005	1	0.
3	1	0.0120	0.050	2	0.
4	1	0.0620	0.100	2	0.
5	1	0.1620	0.200	1	0.
6	1	0.3620	0.600	2	0.
7	3	0.9620	0.006	1	0.

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Thermal Conductor Type 2 ContainmentWall					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	4	0.0000	0.007	2	0.
2	3	0.007	0.005	1	0.
3	1	0.012	0.050	2	0.
4	1	0.062	0.100	2	0.
5	1	0.162	0.200	1	0.
6	1	0.362	0.400	1	0.
7	1	0.762	01.150	2	0.
8	3	1.912	0.006	1	0.

Thermal Conductor Type 3 Base Concrete					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	5	0.0000	0.0160	4	0.
2	2	0.0160	0.010000	2	0.
3	2	0.0260	0.0200	2	0.
4	2	0.0460	0.0400	1	0.
5	2	0.0860	0.0800	1	0.
6	2	0.1660	0.1600	1	0.
7	2	0.3260	0.3200	1	0.
8	2	0.6460	0.6400	1	0.
9	2	1.2860	1.2800	1	0.
10	2	2.5660	2.5600	1	0.
11	2	5.1260	5.1200	1	0.
12	2	10.2460	10.2400	1	0.
13	2	20.4860	20.4800	1	0.
14	2	40.966	40.9600	1	0.
15	2	81.9260	55.7300	1	0.

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Thermal Conductor Type 4 Thick Conc. Lo					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	5	0.000	0.016	4	0.
2	2	0.016	0.010	1	0.
3	2	0.026	0.020	1	0.
4	2	0.046	0.040	1	0.
5	2	0.086	0.080	1	0.
6	2	0.166	0.160	1	0.
7	2	0.326	0.320	1	0.
8	2	0.646	0.640	1	0.
9	2	1.286	1.280	1	0.
10	2	2.566	2.560	1	0.
11	2	5.126	5.120	1	0.
12	2	10.246	10.240	1	0.
13	2	20.486	33.770	2	0.

Thermal Conductor Type 5 Thin Conc. Lo					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	5	0.0000	0.016	4	0.
2	2	0.0160	0.010	1	0.
3	2	0.0260	0.020	1	0.
4	2	0.0460	0.040	1	0.
5	2	0.0860	0.080	1	0.
6	2	0.1660	0.160	1	0.
7	2	0.3260	0.320	1	0.
8	2	0.6460	0.640	1	0.
9	2	1.2860	1.280	1	0.
10	2	2.5660	2.560	1	0.
11	2	5.1260	5.120	1	0.
12	2	10.2460	7.1220	1	0.

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Thermal Conductor Type 6 Thin Conc. Hi					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	5	0.0	0.016	4	0.
2	2	0.0160	0.010	1	0.
3	2	0.0260	0.020	1	0.
4	2	0.0460	0.040	1	0.
5	2	0.0860	0.080	1	0.
6	2	0.1660	0.160	1	0.
7	2	0.3260	0.320	1	0.
8	2	0.6460	0.640	1	0.
9	2	1.2860	1.280	1	0.
10	2	2.5660	2.560	1	0.
11	2	5.1260	5.120	1	0.
12	2	10.2460	9.498	1	0.

Thermal Conductor Type 7 Thick Conc. Hi					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	5	0.0	0.016	4	0.
2	2	0.0160	0.010	1	0.
3	2	0.0260	0.020	1	0.
4	2	0.0460	0.040	1	0.
5	2	0.0860	0.080	1	0.
6	2	0.1660	0.160	1	0.
7	2	0.3260	0.320	1	0.
8	2	0.6460	0.640	1	0.
9	2	1.2860	1.280	1	0.
10	2	2.5660	2.560	1	0.
11	2	5.1260	5.120	1	0.
12	2	10.2460	10.240	1	0.
13	2	20.4860	22.130	1	0.

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Thermal Conductor Type 8 Stainless .228					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	6	0.0000	0.050000	1	0.
2	6	0.050000	0.17664	2	0.

Thermal Conductor Type 9 Galv.Steel 37.5					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	7	0.0000	0.004000	1	0.
2	1	0.004000	0.04298	2	0.

Thermal Conductor Type 10 Galv.Steel 78.3					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	7	0.0	0.00080	1	0.
2	1	0.00080	0.07852	2	0.

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Thermal Conductor Type 11 Galv.Steel 432.					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	7	0.0000	0.002000	1	0.
2	1	0.002000	0.050000	2	0.
3	1	0.052000	0.099000	1	0.
4	1	0.151000	0.283300	1	0.

Thermal Conductor Type 12 71 Steel					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	8	0.0000	0.009000	2	0.
2	1	0.009000	0.071180	2	0.

Thermal Conductor Type 13 164 Steel					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	8	0.000	0.009000	2	0.
2	1	0.009000	0.16461	3	0.

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Thermal Conductor Type 14 413 Steel					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	8	0.0	0.0090	2	0.
2	1	0.0090	0.050000	2	0.
3	1	0.059000	0.092000	2	0.
4	1	0.151000	0.27072	2	0.

Thermal Conductor Type 15 739 Steel					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	8	0.00	0.0090	2	0.
2	1	0.0090	0.050000	2	0.
3	1	0.059000	0.101000	2	0.
4	1	0.160000	0.201000	1	0.
5	1	0.361000	0.38983	1	0.

Thermal Conductor Type 16 1.7" Steel					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	8	0.0	0.0090	2	0.
2	1	0.0090	0.050000	2	0.
3	1	0.059000	0.100000	2	0.
4	1	0.159000	0.202000	1	0.
5	1	0.361000	0.403000	1	0.
6	1	0.764000	0.923400	1	0.

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Thermal Conductor Type 17 Stainless 0.024					
Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	6	0.0000	0.024000	2	0.

Materials	
Type #	Description
1	Carbon Steel
2	Concrete
3	Paint 1 (bottom coat)
4	Paint 2 (top coat)
5	Paint Film
6	Stainless Steel
7	Zinc
8	Paint on Misc. Steel
9	304 Type Stainless Steel

Material Type 1 Carbon Steel			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	489.	25.9	0.10955
1000.	489.	25.9	0.10955

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Material Type 2 Concrete			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	115.	1.	0.2774
1000.	115.	1.	0.2774

Material Type 3 Paint 1 (bottom coat)			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	68.64	0.083	0.286
1000.	68.64	0.083	0.286

Material Type 4 Paint 2 (top coat)			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	68.64	1.5	0.1919
1000.	68.64	1.5	0.1919

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Material Type 5 Paint Film			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	68.64	0.156	0.4079
1000.	68.64	0.156	0.4079

Material Type 6 Stainless Steel			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	490.	9.8	0.11
1000.	490.	9.8	0.11

Material Type 7 Zinc			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	446.	64.	0.091
1000.	446.	64.	0.091

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Material Type 8 Paint on Misc. Steel			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	68.64	0.235	0.558
1000.	68.64	0.235	0.558

Material Type 9 304 Type Stainless Steel			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	487.8	8.99	0.11
1000.	487.8	8.99	0.11

Cooler/Heater										
Heater Cooler #	Description	Vol. #	On Trip #	Off Trip #	Flow Rate (CFM)	Flow Rate FF	Heat Rate (Btu/s)	Heat Rate FF	Phs Opt	Ct L
1C	Cooler	1	1		90000.	0	2.	4	VTS	

Heat Exchangers - Table 1				
Heat Ex. #	Description	HX Type #	Flow Path #	Secon-dary HX #
1H	SDC HX	1	5	

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Heat Exchangers - Table 2

Heat Ex. #	Scndy Flow (lbm/s)	Scnd Flow FF	Scndy Temp (F)	Scnd Temp FF	Ext. Flow (lbm/s)	Ext. Flow FF	Ext. Heat (Btu/s)	Ext. Heat FF
1H	410.9		112.		0.		0.	

Heat Exchanger Types - Table 1

HX Type #	Option	Passes or Zones	Tube Mat. Type #	Thick-ness (in)	Wall Area (ft2)
1	TUBE-SHELL	1	9	0.049	7000.

Heat Exchanger Types - Table 2

HX Type #	Side	Fin Type	Flow Area (ft2)	Hyd. Diam. (in)	Tot. S. Area (ft2)	H.T. Coef Curv	H.T. Coef Type	Fouling Resistance (h-f2-F/B)
1	PRIM	NONE	1.718	0.6485	6053.	6	TIME	
	seco	NONE	8.066	2.44	7000.	7	TIME	

Heat Exchanger Types - Table 3
Fin Parameters

HX Type #	Side	Fin Mat. Type #	Pin Diam. (in)	Length (in)	Thick-ness (in)	Surf. Area (ft2)
1	prim	0	0.	0.	0.	0.
	SECO	0	0.	0.	0.	0.

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Spray Nozzles							
Nozzle #	Description	Flow Path #	Dis. Vol. #	Drop Dia. (in.)	Drop Dia. FF	Spray Flow Frac.	Flow Frac. FF
1N	RCB Spray:RAS	5	1	0.0276		1.	

Component Trips									
Trip #	Sense Var.	Sensor 1 Loc.	Sensor 2 Loc.	Var. Limit	Set Point	Delay Time	Rset Trip	Cond Trip	Cond Type
1	PRESS	1	-	UPPER	19.7	10	-	-	AND
2	PRESS	1		UPPER	19.7	1			AND

Functions				
FF#	Description	Ind. Var.	Dep. Var.	Points
0	Constant	-	-	0
1	Blowdown Flow	Time (Sec)	Flow (lb/s	48
2	Blowdown Enthal	Time	Enthalpy (	49
3	RCS Pressure Ps	Time	RCS Pressu	21
4	CFC Cooling	RCB Temp.	CFC Heat T	8
5	Pre-RAS CS Cont	Time(sec)	CS On/Off	12
6	SDCHX Tube h	Time(s)	h (BTU/hrf	4
7	SDCHX Shell h	Time(s)	h (BTU/hrf	4
8	LT Liq. Flow To	Time (s)	Liquid to	155
9	LT Liq. Flow En	Time (s)	Enthalpy (	155
10	CS Flow Fractio	Time(s)	Flow On/Of	4
11	Post-RAS Sump L	Time (s)	Flow (lbm/	65
12	LT Steam Mass R	Time(sec)	lb/sec	494
13	LT Steam Enthal	Time(s)	Btu/lb	492
14	SIT Nitrogen	Time (sec)	Flow (lb/s	16

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Function 1 Blowdown Flow Ind. Var.: Time (Sec) Dep. Var.: Flow (lb/s)			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	0.5	104850.
1.	79865.	1.5	71647.
2.	70756.	2.5	67890.
3.	61715.	4.	50496.
5.	45268.	6.	37947.
7.	22092.	8.	14321.
9.	9539.2	10.	8709.4
11.	4933.2	12.	2649.6
12.1	2533.5	12.2	2731.6
12.3	3020.5	12.4	3689.7
12.5	4110.1	12.6	4319.2
12.7	4386.2	12.8	4405.9
12.9	4406.4	13.	4349.8
13.1	4254.4	13.2	4096.1
13.3	3846.1	13.4	3586.4
13.5	3314.6	13.6	3015.9
13.7	2782.1	13.8	2555.4
13.9	2348.1	14.	2163.5
14.1	1975.4	14.2	1738.7
14.3	1536.6	14.4	1392.3
14.5	1239.2	14.6	1065.9
14.7	928.18	14.8	780.31
14.9	620.86	15.	502.23
15.01	0.	1000000.	0.

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Function
2
Blowdown Enthalpy
Ind. Var.: Time
Dep. Var.: Enthalpy (BTU/lb)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	625.1	0.5	625.1
1.	631.5	1.5	620.39
2.	603.55	2.5	595.33
3.	607.05	4.	632.92
5.	628.96	6.	634.7
7.	782.87	8.	945.1
9.	990.85	10.	918.93
11.	1086.33	12.	1212.35
12.1	1217.16	12.2	1223.06
12.3	1172.88	12.4	945.07
12.5	855.1	12.6	816.61
12.7	791.53	12.8	773.87
12.9	760.56	13.	753.05
13.1	757.55	13.2	773.9
13.3	796.4	13.4	825.13
13.5	882.04	13.6	929.32
13.7	970.36	13.8	1017.13
13.9	1061.13	14.	1100.85
14.1	1145.41	14.2	1199.32
14.3	1212.79	14.4	1218.22
14.5	1224.88	14.6	1228.75
14.7	1231.51	14.8	1233.57
14.9	1233.34	15.	1231.33
15.01	1231.33	15.11	100.
1000000.	100.		

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Function
3
RCS Pressure Psia
Ind. Var.: Time
Dep. Var.: RCS Pressure (psia)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	2315.	0.5	913.5
1.	716.63	1.5	632.66
2.	599.06	2.5	571.56
3.	543.7	4.	497.04
5.	443.13	6.	385.3
7.	323.51	8.	266.7
9.	188.1	10.	153.66
11.	113.65	12.	72.6
13.	78.26	14.	64.34
15.	55.22	15.1	20.
1000000.	20.		

Function
4
CFC Cooling
Ind. Var.: RCB Temp. (F)
Dep. Var.: CFC Heat Tfer(BTU/s)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
20.	0.	129.99	0.
130.	1376.6	150.	3392.13
200.	10582.	251.	19751.
261.	21590.	1000000.	21590.

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Function
5
Pre-RAS CS Control
Ind. Var.: Time(sec)
Dep. Var.: CS On/Off

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	31.56	0.
31.57	0.169789	35.57	0.169789
35.58	0.328612	38.27	0.328612
38.28	0.407424	39.21	0.407424
39.22	1.	3171.24	1.
3171.25	0.	1000000.	0.

Function
6
SDCHX Tube h
Ind. Var.: Time(s)
Dep. Var.: h (BTU/hrft2F)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	3171.24	0.
3171.25	855.65	1000000.	855.65

Function
7
SDCHX Shell h
Ind. Var.: Time(s)
Dep. Var.: h (BTU/hrft2F)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	3171.24	0.
3171.25	1344.15	1000000.	1344.15

Function
8
LT Liq. Flow To Sump
Ind. Var.: Time (s)
Dep. Var.: Liquid to Sump (lb/s)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.

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Function 8 LT Liq. Flow To Sump Ind. Var.: Time (s) Dep. Var.: Liquid to Sump (lb/s)			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	15.0033	0.
15.0533	0.	31.8033	0.
31.8533	291.741	31.9033	276.257
31.9533	277.107	32.0033	277.142
32.0533	277.216	32.1033	277.289
32.1533	277.361	32.2033	277.434
32.2533	277.506	32.3033	277.578
32.3533	277.65	32.4033	277.722
32.4533	277.794	32.5033	277.866
32.5533	277.938	32.6033	278.009
32.6533	278.081	32.7033	278.152
32.7533	278.224	32.8033	278.295
32.8533	278.366	32.9033	278.438
32.9533	278.509	33.0033	278.58
33.0533	278.651	33.1033	278.721
33.1533	278.792	33.2033	278.863
33.2533	278.933	33.3033	279.004
33.3533	279.074	33.4033	279.145
33.4533	279.215	33.5033	279.285
33.5533	362.845	33.6033	358.628
33.6533	358.921	33.7033	358.982
33.7533	359.054	33.8033	359.126
33.8533	359.198	33.9033	359.27
33.9533	359.341	34.0033	359.413
34.0533	359.484	34.1033	359.556
34.1533	359.627	34.2033	359.698
34.2533	359.769	34.3033	359.841
34.3533	359.911	49.1533	389.414
64.0033	471.685	78.8533	478.827
93.6533	489.644	108.503	491.107
123.353	495.757	138.203	578.124
153.003	648.425	167.853	652.007
182.703	655.138	197.553	657.897
212.353	660.266	227.203	662.449
242.053	664.505	256.903	666.346
271.703	667.894	286.553	669.384
301.403	670.798	316.253	672.029
331.053	673.213	345.903	674.264
360.753	675.207	375.603	676.11
390.403	676.997	405.253	677.85
420.103	678.646	434.953	679.431
449.803	680.206	464.653	680.917

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Function 8 LT Liq. Flow To Sump Ind. Var.: Time (s) Dep. Var.: Liquid to Sump (lb/s)			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
479.503	681.619	494.303	682.308
683.003	689.366	980.003	696.927
1277.	702.134	1573.	706.085
1870.	709.153	2334.	712.986
2928.	716.955	3520.	79.091
4114.	81.372	4708.	83.2984
5302.	84.8846	5894.	86.3015
6488.	87.4654	7082.	88.5344
7676.	89.4277	8268.	90.2479
8862.	90.9887	9456.	91.6477
10000.	92.2241	10514.	92.3038
11028.	92.3635	11544.	92.4118
12056.	92.4825	12572.	92.7998
13086.	93.1243	13600.	93.4538
14114.	93.7752	14628.	94.0573
15144.	94.3402	15658.	94.6221
16172.	94.893	16686.	95.1404
17200.	95.387	17716.	95.6344
18228.	95.8655	18744.	96.0791
19258.	96.2912	19774.	96.5037
22860.	97.5847	28000.	99.1354
33160.	100.378	38300.	101.407
43440.	102.295	48580.	103.074
53740.	103.738	58880.	104.361
64000.	104.912	69160.	105.443
74300.	105.901	79460.	106.345
84580.	106.734	89740.	107.119
94880.	106.404	100020.	105.602
132000.	107.201	164000.	108.392
196000.	109.298	228000.	109.991
260000.	110.624	292000.	111.17
360000.	112.079	440000.	113.304
520000.	114.589	600000.	115.615
680000.	116.5	760000.	117.303
840000.	118.035	920000.	118.698
1000000.	119.287		

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Function
9
LT Liq. Flow Enthalpy
Ind. Var.: Time (s)
Dep. Var.: Enthalpy (Btu/lbm)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	100.	15.0033	100.
15.0533	100.	31.8033	100.
31.8533	67.9716	31.9033	67.9716
31.9533	67.9716	32.0033	67.9716
32.0533	67.9716	32.1033	67.9716
32.1533	67.9716	32.2033	67.9716
32.2533	67.9716	32.3033	67.9716
32.3533	67.9716	32.4033	67.9716
32.4533	67.9716	32.5033	67.9716
32.5533	67.9716	32.6033	67.9716
32.6533	67.9716	32.7033	67.9716
32.7533	67.9716	32.8033	67.9716
32.8533	67.9716	32.9033	67.9716
32.9533	67.9716	33.0033	67.9716
33.0533	67.9716	33.1033	67.9716
33.1533	67.9716	33.2033	67.9716
33.2533	67.9716	33.3033	67.9716
33.3533	67.9716	33.4033	67.9716
33.4533	67.9716	33.5033	67.9716
33.5533	67.9716	33.6033	67.9716
33.6533	67.9716	33.7033	67.9716
33.7533	67.9716	33.8033	67.9716
33.8533	67.9716	33.9033	67.9716
33.9533	67.9716	34.0033	67.9716
34.0533	67.9716	34.1033	67.9716
34.1533	67.9716	34.2033	67.9716
34.2533	67.9716	34.3033	67.9716
34.3533	67.9716	49.1533	67.9716
64.0033	67.9716	78.8533	67.9716
93.6533	67.9716	108.503	67.9716
123.353	67.9716	138.203	67.9716
153.003	67.9716	167.853	67.9716
182.703	67.9716	197.553	67.9716
212.353	67.9716	227.203	67.9716
242.053	67.9716	256.903	67.9716
271.703	67.9716	286.553	67.9716
301.403	67.9716	316.253	67.9716
331.053	67.9716	345.903	67.9716
360.753	67.9716	375.603	67.9716
390.403	67.9716	405.253	67.9716
420.103	67.9716	434.953	67.9716
449.803	67.9716	464.653	67.9716

Attachment II to EC-S01-005 - Hmin1s2f
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Function
9
LT Liq. Flow Enthalpy
Ind. Var.: Time (s)
Dep. Var.: Enthalpy (Btu/lbm)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
479.503	67.9716	494.303	67.9716
683.003	67.9716	980.003	67.9716
1277.	67.9716	1573.	67.9716
1870.	67.9716	2334.	67.9716
2928.	67.9716	3520.	107.391
4114.	109.249	4708.	110.908
5302.	112.386	5894.	113.7
6488.	114.878	7082.	115.932
7676.	116.879	8268.	117.728
8862.	118.496	9456.	119.189
10000.	119.765	10514.	120.264
11028.	120.726	11544.	121.161
12056.	121.567	12572.	121.953
13086.	122.313	13600.	122.649
14114.	122.961	14628.	123.249
15144.	123.516	15658.	123.761
16172.	123.986	16686.	124.191
17200.	124.379	17716.	124.55
18228.	124.704	18744.	124.845
19258.	124.97	19774.	125.083
22860.	125.516	28000.	125.567
33160.	125.1	38300.	124.359
43440.	123.484	48580.	122.557
53740.	121.627	58880.	120.732
64000.	119.878	69160.	119.067
74300.	118.306	79460.	117.595
84580.	116.937	89740.	116.321
94880.	115.857	100020.	115.713
132000.	114.866	164000.	113.397
196000.	112.154	228000.	111.18
260000.	110.349	292000.	109.632
360000.	108.405	440000.	107.047
520000.	105.386	600000.	104.102
680000.	102.976	760000.	101.958
840000.	101.035	920000.	100.197
1000000.	99.4616		

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Function 10 CS Flow Fraction From Sump Ind. Var.: Time(s) Dep. Var.: Flow On/Off			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	3171.24	0.
3171.25	1.	1000000.	1.

Attachment II to EC-S01-005 - Hmin1s2f
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Function
11
Post-RAS Sump Liq. Removal
Ind. Var.: Time (s)
Dep. Var.: Flow (lbm/s)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	3171.24	0.
3171.25	-128.44	3520.	-128.44
4114.	-128.44	4708.	-128.44
5302.	-128.44	5894.	-128.44
6488.	-128.44	7082.	-128.44
7676.	-128.44	8268.	-128.44
8862.	-128.44	9456.	-128.44
10000.	-128.44	10514.	-128.44
11028.	-128.44	11544.	-128.44
12056.	-128.44	12572.	-128.44
13086.	-128.44	13600.	-128.44
14114.	-128.44	14628.	-128.44
15144.	-128.44	15658.	-128.44
16172.	-128.44	16686.	-128.44
17200.	-128.44	17716.	-128.44
18228.	-128.44	18744.	-128.44
19258.	-128.44	19774.	-128.44
22860.	-128.44	28000.	-128.44
33160.	-128.44	38300.	-128.44
43440.	-128.44	48580.	-128.44
53740.	-128.44	58880.	-128.44
64000.	-128.44	69160.	-128.44
74300.	-128.44	79460.	-128.44
84580.	-128.44	89740.	-128.44
94880.	-128.44	100020.	-128.44
132000.	-128.44	164000.	-128.44
196000.	-128.44	228000.	-128.44
260000.	-128.44	292000.	-128.44
360000.	-128.44	440000.	-128.44
520000.	-128.44	600000.	-128.44
680000.	-128.44	760000.	-128.44
840000.	-128.44	920000.	-128.44
1000000.	-128.44		

Function
12
LT Steam Mass Release
Ind. Var.: Time(sec)
Dep. Var.: lb/sec

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.

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Function
12
LT Steam Mass Release
Ind. Var.: Time(sec)
Dep. Var.: lb/sec

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	15.0033	0.
15.0033	2830.1	15.0533	2830.1
15.0533	2773.48	15.1033	2786.95
15.1533	2785.88	15.2033	2785.32
15.2533	2784.76	15.3033	2784.23
15.3533	2783.72	15.4033	2783.22
15.4533	2782.75	15.5033	2782.29
15.5533	2781.85	15.6033	2781.42
15.6533	2781.02	15.7033	2780.62
15.7533	2780.24	15.8033	2779.88
15.8533	2779.52	15.9033	2779.18
15.9533	2778.85	16.0033	2778.53
16.0533	2778.23	16.1033	2777.93
16.1533	2777.64	16.2033	2777.37
16.2533	2777.1	16.3033	2776.84
16.3533	2776.58	16.4033	2776.34
16.4533	2691.24	16.5033	2693.9
16.5533	2693.57	16.6033	2693.35
16.6533	2693.14	16.7033	2692.93
16.7533	2692.73	16.8033	2692.53
16.8533	2692.34	16.9033	2692.15
16.9533	2691.97	17.0033	2691.79
17.0533	2691.61	17.1033	2691.44
17.1533	2691.28	17.2033	2431.59
17.2533	2414.09	17.3033	2414.54
17.3533	2414.35	17.4033	2414.2
17.4533	2414.04	17.5033	2413.89
17.5533	2413.75	17.6033	2374.2
17.6533	2375.44	17.7033	2375.25
17.7533	2375.11	17.8033	2374.98
17.8533	2374.84	17.9033	2374.71
17.9533	2374.58	18.0033	2374.45
18.0533	2374.32	18.1033	2374.19
18.1533	2374.07	18.2033	2373.94
18.2533	2373.82	18.3033	2373.7
18.3533	2373.58	18.4033	2373.46
18.4533	2373.34	18.5033	2373.23
18.5533	827.19	18.6033	887.848
18.6533	885.313	18.7033	885.265
18.7533	885.121	18.8033	841.117
18.8533	842.719	18.9033	842.512
18.9533	842.379	19.0033	842.243

Attachment II to EC-S01-005 - Hmin1s2f
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Function 12 LT Steam Mass Release Ind. Var.: Time(sec) Dep. Var.: lb/sec			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
19.0533	842.109	19.1033	841.975
19.1533	841.843	19.2033	841.711
19.2533	841.58	19.3033	841.45
19.3533	841.32	19.4033	841.192
19.4533	841.064	19.5033	840.937
19.5533	840.81	19.6033	840.684
19.6533	840.559	19.7033	840.434
19.7533	840.31	19.8033	840.186
19.8533	840.063	19.9033	839.94
19.9533	839.818	19.9533	839.818
20.0033	839.697	20.0533	839.576
20.1033	839.455	20.1533	839.335
20.2033	839.216	20.2533	839.097
20.3033	838.978	20.3533	838.86
20.4033	838.742	20.4533	838.624
20.5033	838.507	20.5533	838.391
20.6033	838.275	20.6533	838.159
20.7033	838.043	20.7533	837.928
20.8033	837.814	20.8533	837.699
20.9033	837.585	20.9533	837.472
21.0033	837.358	21.0533	837.245
21.1033	837.133	21.1533	837.021
21.2033	836.909	21.2533	836.797
21.3033	836.686	21.3533	836.575
21.4033	836.464	21.4533	836.354
21.5033	836.244	21.5533	836.134
21.6033	836.025	21.6533	835.915
21.7033	835.807	21.7533	835.698
21.8033	835.59	21.8533	835.482
21.9033	835.374	21.9533	835.267
22.0033	835.16	22.0533	835.053
22.1033	834.946	22.1533	834.84
22.2033	834.734	22.2533	834.628
22.3033	834.523	22.3533	834.418
22.4033	834.313	22.4533	834.208
22.5033	834.104	22.5533	833.999
22.6033	833.896	22.6533	833.792
22.7033	833.688	22.7533	833.585
22.8033	833.482	22.8533	833.38
22.9033	833.277	22.9533	833.175
23.0033	833.073	23.0533	832.972
23.1033	832.87	23.1533	832.769

Attachment II to EC-S01-005 - Hmin1s2f
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Function
12
LT Steam Mass Release
Ind. Var.: Time(sec)
Dep. Var.: lb/sec

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
23.2033	832.668	23.2533	832.568
23.3033	832.467	23.3533	832.367
23.4033	832.267	23.4533	832.168
23.5033	832.068	23.5533	831.969
23.6033	831.87	23.6533	831.771
23.7033	831.673	23.7533	831.574
23.8033	831.476	23.8533	831.379
23.9033	831.281	23.9533	831.184
24.0033	831.086	24.0533	830.99
24.1033	830.893	24.1533	830.796
24.2033	830.7	24.2533	830.604
24.3033	830.508	24.3533	830.413
24.4033	830.318	24.4533	830.222
24.5033	830.128	24.5533	830.033
24.6033	829.938	24.6533	829.844
24.7033	829.75	24.7533	829.656
24.8033	829.563	24.8533	829.469
24.9033	829.376	24.9533	829.283
24.9533	829.283	25.0033	829.19
25.0533	829.098	25.1033	829.006
25.1533	828.914	25.2033	828.822
25.2533	828.73	25.3033	828.638
25.3533	828.547	25.4033	828.456
25.4533	828.365	25.5033	828.275
25.5533	828.184	25.6033	828.094
25.6533	828.004	25.7033	827.914
25.7533	827.824	25.8033	827.735
25.8533	827.646	25.9033	827.557
25.9533	827.468	26.0033	827.379
26.0533	827.291	26.1033	827.203
26.1533	827.115	26.2033	827.027
26.2533	826.939	26.3033	826.852
26.3533	826.764	26.4033	826.677
26.4533	826.59	26.5033	826.504
26.5533	826.417	26.6033	826.331
26.6533	826.245	26.7033	826.159
26.7533	826.074	26.8033	825.988
26.8533	825.903	26.9033	825.818
26.9533	825.733	27.0033	825.648
27.0533	825.563	27.1033	825.479
27.1533	825.395	27.2033	825.311
27.2533	825.227	27.3033	825.144

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Function 12 LT Steam Mass Release Ind. Var.: Time(sec) Dep. Var.: lb/sec			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
27.3533	825.06	27.4033	824.977
27.4533	824.894	27.5033	824.811
27.5533	824.728	27.6033	824.646
27.6533	824.563	27.7033	824.481
27.7533	824.399	27.8033	824.317
27.8533	824.236	27.9033	824.154
27.9533	824.073	28.0033	823.992
28.0533	823.911	28.1033	823.83
28.1533	823.749	28.2033	823.669
28.2533	823.589	28.3033	823.509
28.3533	823.429	28.4033	823.349
28.4533	823.269	28.5033	823.19
28.5533	823.111	28.6033	823.032
28.6533	822.953	28.7033	822.874
28.7533	822.796	28.8033	822.717
28.8533	822.639	28.9033	822.561
28.9533	822.483	29.0033	822.405
29.0533	822.328	29.1033	822.25
29.1533	822.173	29.2033	822.096
29.2533	822.019	29.3033	821.942
29.3533	821.866	29.4033	821.789
29.4533	821.713	29.5033	821.637
29.5533	821.561	29.6033	821.485
29.6533	821.409	29.7033	821.334
29.7533	821.259	29.8033	821.183
29.8533	821.108	29.9033	821.034
29.9533	820.959	29.9533	820.959
30.0033	820.884	30.0533	820.81
30.1033	820.736	30.1533	820.662
30.2033	820.588	30.2533	820.514
30.3033	820.44	30.3533	820.367
30.4033	820.293	30.4533	820.22
30.5033	820.147	30.5533	820.074
30.6033	820.002	30.6533	819.929
30.7033	819.857	30.7533	819.784
30.8033	819.712	30.8533	819.64
30.9033	819.568	30.9533	819.497
31.0033	819.425	31.0533	819.354
31.1033	819.283	31.1533	819.211
31.2033	819.14	31.2533	819.07
31.3033	818.999	31.3533	818.928
31.4033	818.858	31.4533	818.788

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Function 12 LT Steam Mass Release Ind. Var.: Time(sec) Dep. Var.: lb/sec			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
31.5033	818.718	31.5533	818.648
31.6033	818.578	31.6533	818.508
31.7033	818.439	31.7533	818.369
31.8033	818.3	31.8533	476.339
31.9033	491.823	31.9533	490.973
32.0033	490.938	32.0533	490.864
32.1033	490.791	32.1533	490.719
32.2033	490.646	32.2533	490.574
32.3033	490.502	32.3533	490.43
32.4033	490.358	32.4533	490.286
32.5033	490.214	32.5533	490.142
32.6033	490.07	32.6533	489.999
32.7033	489.927	32.7533	489.856
32.8033	489.785	32.8533	489.714
32.9033	489.642	32.9533	489.571
33.0033	489.5	33.0533	489.429
33.1033	489.359	33.1533	489.288
33.2033	489.217	33.2533	489.147
33.3033	489.076	33.3533	489.006
33.4033	488.935	33.4533	488.865
33.5033	488.795	33.5533	405.235
33.6033	409.452	33.6533	409.159
33.7033	409.099	33.7533	409.026
33.8033	408.954	33.8533	408.882
33.9033	408.81	33.9533	408.739
34.0033	408.667	34.0533	408.596
34.1033	408.524	34.1533	408.453
34.2033	408.382	34.2533	408.311
34.3033	408.24	34.3533	408.168
49.1533	378.666	64.0033	296.395
78.8533	289.253	93.6533	278.436
108.503	276.973	123.353	272.323
138.203	189.956	153.003	119.655
167.853	116.073	182.703	112.942
197.553	110.183	212.353	107.814
227.203	105.631	242.053	103.575
256.903	101.734	271.703	100.186
286.553	98.696	301.403	97.2823
316.253	96.0511	331.053	94.8673
345.903	93.816	360.753	92.8726
375.603	91.9695	390.403	91.0825
405.253	90.2298	420.103	89.4338

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Function 12 LT Steam Mass Release Ind. Var.: Time(sec) Dep. Var.: lb/sec			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
434.953	88.6486	449.803	87.8738
464.653	87.1625	479.503	86.4614
494.303	85.7716	683.003	78.7137
980.003	71.1535	1277.	65.946
1573.	61.9949	1870.	58.9272
2334.	55.0941	2928.	51.1248
3520.	49.349	4114.	47.068
4708.	45.1416	5302.	43.5554
5894.	42.1385	6488.	40.9746
7082.	39.9056	7676.	39.0123
8268.	38.1921	8862.	37.4513
9456.	36.7923	10000.	36.2159
10514.	36.1362	11028.	36.0765
11544.	36.0282	12056.	35.9575
12572.	35.6403	13086.	35.3157
13600.	34.9862	14114.	34.6648
14628.	34.3827	15144.	34.0998
15658.	33.8179	16172.	33.547
16686.	33.2996	17200.	33.053
17716.	32.8056	18228.	32.5745
18744.	32.3609	19258.	32.1488
19774.	31.9363	22860.	30.8553
28000.	29.3046	33160.	28.0623
38300.	27.0331	43440.	26.1448
48580.	25.3659	53740.	24.7025
58880.	24.0789	64000.	23.5284
69160.	22.9974	74300.	22.5386
79460.	22.0953	84580.	21.7056
89740.	21.3214	94880.	22.0361
100020.	22.838	132000.	21.2394
164000.	20.0484	196000.	19.1419
228000.	18.4486	260000.	17.8164
292000.	17.2705	360000.	16.3614
440000.	15.1362	520000.	13.8507
600000.	12.825	680000.	11.9401
760000.	11.1367	840000.	10.4047
920000.	9.74169	1000000.	9.15302

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Function 13 LT Steam Enthalpy Ind. Var.: Time(s) Dep. Var.: Btu/lb			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	100.	15.0033	100.
15.0533	1173.32	15.1033	1173.33
15.1533	1173.33	15.2033	1173.34
15.2533	1173.34	15.3033	1173.35
15.3533	1173.35	15.4033	1173.36
15.4533	1173.36	15.5033	1173.37
15.5533	1173.37	15.6033	1173.38
15.6533	1173.38	15.7033	1173.39
15.7533	1173.39	15.8033	1173.4
15.8533	1173.4	15.9033	1173.41
15.9533	1173.41	16.0033	1173.42
16.0533	1173.42	16.1033	1173.43
16.1533	1173.44	16.2033	1173.44
16.2533	1173.45	16.3033	1173.45
16.3533	1173.46	16.4033	1173.46
16.4533	1173.47	16.5033	1173.47
16.5533	1173.48	16.6033	1173.48
16.6533	1173.49	16.7033	1173.49
16.7533	1173.5	16.8033	1173.51
16.8533	1173.51	16.9033	1173.52
16.9533	1173.52	17.0033	1173.53
17.0533	1173.53	17.1033	1173.54
17.1533	1173.54	17.2033	1173.55
17.2533	1173.55	17.3033	1173.56
17.3533	1173.56	17.4033	1173.57
17.4533	1173.57	17.5033	1173.58
17.5533	1173.58	17.6033	1173.58
17.6533	1173.59	17.7033	1173.59
17.7533	1173.6	17.8033	1173.6
17.8533	1173.61	17.9033	1173.61
17.9533	1173.61	18.0033	1173.62
18.0533	1173.62	18.1033	1173.63
18.1533	1173.63	18.2033	1173.64
18.2533	1173.64	18.3033	1173.65
18.3533	1173.65	18.4033	1173.65
18.4533	1173.66	18.5033	1173.66
18.5533	1173.67	18.6033	1173.67
18.6533	1173.66	18.7033	1173.66
18.7533	1173.66	18.8033	1173.66
18.8533	1173.66	18.9033	1173.66
18.9533	1173.66	19.0033	1173.66
19.0533	1173.66	19.1033	1173.65

Attachment II to EC-S01-005 - Hmin1s2f
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Function 13 LT Steam Enthalpy Ind. Var.: Time(s) Dep. Var.: Btu/lb			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
19.1533	1173.65	19.2033	1173.65
19.2533	1173.65	19.3033	1173.65
19.3533	1173.65	19.4033	1173.65
19.4533	1173.65	19.5033	1173.65
19.5533	1173.64	19.6033	1173.64
19.6533	1173.64	19.7033	1173.64
19.7533	1173.64	19.8033	1173.64
19.8533	1173.64	19.9033	1173.64
19.9533	1173.64	19.9533	1173.64
20.0033	1173.64	20.0533	1173.63
20.1033	1173.63	20.1533	1173.63
20.2033	1173.63	20.2533	1173.63
20.3033	1173.63	20.3533	1173.63
20.4033	1173.63	20.4533	1173.63
20.5033	1173.63	20.5533	1173.62
20.6033	1173.62	20.6533	1173.62
20.7033	1173.62	20.7533	1173.62
20.8033	1173.62	20.8533	1173.62
20.9033	1173.62	20.9533	1173.62
21.0033	1173.62	21.0533	1173.61
21.1033	1173.61	21.1533	1173.61
21.2033	1173.61	21.2533	1173.61
21.3033	1173.61	21.3533	1173.61
21.4033	1173.61	21.4533	1173.61
21.5033	1173.61	21.5533	1173.6
21.6033	1173.6	21.6533	1173.6
21.7033	1173.6	21.7533	1173.6
21.8033	1173.6	21.8533	1173.6
21.9033	1173.6	21.9533	1173.6
22.0033	1173.6	22.0533	1173.6
22.1033	1173.6	22.1533	1173.59
22.2033	1173.59	22.2533	1173.59
22.3033	1173.59	22.3533	1173.59
22.4033	1173.59	22.4533	1173.59
22.5033	1173.59	22.5533	1173.59
22.6033	1173.59	22.6533	1173.59
22.7033	1173.58	22.7533	1173.58
22.8033	1173.58	22.8533	1173.58
22.9033	1173.58	22.9533	1173.58
23.0033	1173.58	23.0533	1173.58
23.1033	1173.58	23.1533	1173.58
23.2033	1173.58	23.2533	1173.58

Attachment II to EC-S01-005 - Hmin1s2f
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Function
13
LT Steam Enthalpy
Ind. Var.: Time(s)
Dep. Var.: Btu/lb

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
23.3033	1173.58	23.3533	1173.57
23.4033	1173.57	23.4533	1173.57
23.5033	1173.57	23.5533	1173.57
23.6033	1173.57	23.6533	1173.57
23.7033	1173.57	23.7533	1173.57
23.8033	1173.57	23.8533	1173.57
23.9033	1173.57	23.9533	1173.57
24.0033	1173.56	24.0533	1173.56
24.1033	1173.56	24.1533	1173.56
24.2033	1173.56	24.2533	1173.56
24.3033	1173.56	24.3533	1173.56
24.4033	1173.56	24.4533	1173.56
24.5033	1173.56	24.5533	1173.56
24.6033	1173.56	24.6533	1173.56
24.7033	1173.55	24.7533	1173.55
24.8033	1173.55	24.8533	1173.55
24.9033	1173.55	24.9533	1173.55
24.9533	1173.55	25.0033	1173.55
25.0533	1173.55	25.1033	1173.55
25.1533	1173.55	25.2033	1173.55
25.2533	1173.55	25.3033	1173.55
25.3533	1173.55	25.4033	1173.55
25.4533	1173.54	25.5033	1173.54
25.5533	1173.54	25.6033	1173.54
25.6533	1173.54	25.7033	1173.54
25.7533	1173.54	25.8033	1173.54
25.8533	1173.54	25.9033	1173.54
25.9533	1173.54	26.0033	1173.54
26.0533	1173.54	26.1033	1173.54
26.1533	1173.54	26.2033	1173.54
26.2533	1173.53	26.3033	1173.53
26.3533	1173.53	26.4033	1173.53
26.4533	1173.53	26.5033	1173.53
26.5533	1173.53	26.6033	1173.53
26.6533	1173.53	26.7033	1173.53
26.7533	1173.53	26.8033	1173.53
26.8533	1173.53	26.9033	1173.53
26.9533	1173.53	27.0033	1173.53
27.0533	1173.53	27.1033	1173.52
27.1533	1173.52	27.2033	1173.52
27.2533	1173.52	27.3033	1173.52
27.3533	1173.52	27.4033	1173.52

Attachment II to EC-S01-005 - Hmin1s2f
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Function 13 LT Steam Enthalpy Ind. Var.: Time(s) Dep. Var.: Btu/lb			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
27.4533	1173.52	27.5033	1173.52
27.5533	1173.52	27.6033	1173.52
27.6533	1173.52	27.7033	1173.52
27.7533	1173.52	27.8033	1173.52
27.8533	1173.52	27.9033	1173.52
27.9533	1173.52	28.0033	1173.52
28.0533	1173.51	28.1033	1173.51
28.1533	1173.51	28.2033	1173.51
28.2533	1173.51	28.3033	1173.51
28.3533	1173.51	28.4033	1173.51
28.4533	1173.51	28.5033	1173.51
28.5533	1173.51	28.6033	1173.51
28.6533	1173.51	28.7033	1173.51
28.7533	1173.51	28.8033	1173.51
28.8533	1173.51	28.9033	1173.51
28.9533	1173.51	29.0033	1173.51
29.0533	1173.51	29.1033	1173.51
29.1533	1173.5	29.2033	1173.5
29.2533	1173.5	29.3033	1173.5
29.3533	1173.5	29.4033	1173.5
29.4533	1173.5	29.5033	1173.5
29.5533	1173.5	29.6033	1173.5
29.6533	1173.5	29.7033	1173.5
29.7533	1173.5	29.8033	1173.5
29.8533	1173.5	29.9033	1173.5
29.9533	1173.5	29.9533	1173.5
30.0033	1173.5	30.0533	1173.5
30.1033	1173.5	30.1533	1173.5
30.2033	1173.5	30.2533	1173.5
30.3033	1173.5	30.3533	1173.5
30.4033	1173.49	30.4533	1173.49
30.5033	1173.49	30.5533	1173.49
30.6033	1173.49	30.6533	1173.49
30.7033	1173.49	30.7533	1173.49
30.8033	1173.49	30.8533	1173.49
30.9033	1173.49	30.9533	1173.49
31.0033	1173.49	31.0533	1173.49
31.1033	1173.49	31.1533	1173.49
31.2033	1173.49	31.2533	1173.49
31.3033	1173.49	31.3533	1173.49
31.4033	1173.49	31.4533	1173.49
31.5033	1173.49	31.5533	1173.49

Attachment II to EC-S01-005 - Hmin1s2f
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Function
13
LT Steam Enthalpy
Ind. Var.: Time(s)
Dep. Var.: Btu/lb

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
31.6033	1173.49	31.6533	1173.49
31.7033	1173.49	31.7533	1173.49
31.8033	1173.48	31.8533	1173.45
31.9033	1173.44	31.9533	1173.44
32.0033	1173.44	32.0533	1173.44
32.1033	1173.44	32.1533	1173.44
32.2033	1173.44	32.2533	1173.43
32.3033	1173.43	32.3533	1173.43
32.4033	1173.43	32.4533	1173.43
32.5033	1173.43	32.5533	1173.43
32.6033	1173.42	32.6533	1173.42
32.7033	1173.42	32.7533	1173.42
32.8033	1173.42	32.8533	1173.42
32.9033	1173.42	32.9533	1173.41
33.0033	1173.41	33.0533	1173.41
33.1033	1173.41	33.1533	1173.41
33.2033	1173.41	33.2533	1173.41
33.3033	1173.4	33.3533	1173.4
33.4033	1173.4	33.4533	1173.4
33.5033	1173.4	33.5533	1173.4
33.6033	1173.4	33.6533	1173.39
33.7033	1173.39	33.7533	1173.39
33.8033	1173.39	33.8533	1173.39
33.9033	1173.39	33.9533	1173.38
34.0033	1173.38	34.0533	1173.38
34.1033	1173.38	34.1533	1173.38
34.2033	1173.38	34.2533	1173.37
34.3033	1173.37	34.3533	1173.37
49.1533	1172.9	64.0033	1172.47
78.8533	1172.11	93.6533	1171.82
108.503	1171.58	123.353	1171.38
138.203	1171.18	153.003	1170.94
167.853	1170.66	182.703	1170.4
197.553	1170.17	212.353	1169.96
227.203	1169.76	242.053	1169.58
256.903	1169.41	271.703	1169.25
286.553	1169.1	301.403	1168.96
316.253	1168.83	331.053	1168.7
345.903	1168.58	360.753	1168.47
375.603	1168.35	390.403	1168.25
405.253	1168.14	420.103	1168.04
434.953	1167.94	449.803	1167.85

Attachment II to EC-S01-005 - Hmin1s2f
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Function 13 LT Steam Enthalpy Ind. Var.: Time(s) Dep. Var.: Btu/lb			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
464.653	1167.76	479.503	1167.67
494.303	1167.58	683.003	1166.7
980.003	1165.79	1277.	1165.17
1573.	1164.67	1870.	1164.19
2334.	1163.45	2928.	1162.57
3520.	1162.01	4114.	1161.6
4708.	1161.21	5302.	1160.85
5894.	1160.54	6488.	1160.26
7082.	1160.01	7676.	1159.8
8268.	1159.61	8862.	1159.44
9456.	1159.29	10000.	1159.17
10514.	1159.07	11028.	1159.01
11544.	1158.96	12056.	1158.92
12572.	1158.88	13086.	1158.83
13600.	1158.77	14114.	1158.72
14628.	1158.67	15144.	1158.62
15658.	1158.56	16172.	1158.51
16686.	1158.47	17200.	1158.42
17716.	1158.38	18228.	1158.33
18744.	1158.29	19258.	1158.25
19774.	1158.21	22860.	1158.01
28000.	1157.72	33160.	1157.49
38300.	1157.3	43440.	1157.13
48580.	1156.99	53740.	1156.86
58880.	1156.75	64000.	1156.65
69160.	1156.56	74300.	1156.47
79460.	1156.39	84580.	1156.32
89740.	1156.26	94880.	1156.31
100020.	1156.41	132000.	1156.21
164000.	1156.01	196000.	1155.87
228000.	1155.76	260000.	1155.65
292000.	1155.57	360000.	1155.42
440000.	1155.24	520000.	1155.05
600000.	1154.9	680000.	1154.76
760000.	1154.65	840000.	1154.54
920000.	1154.45	1000000.	1154.36

Attachment II to EC-S01-005 - Hmin1s2f
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Function 14 SIT Nitrogen Ind. Var.: Time (sec) Dep. Var.: Flow (lb/sec)			
Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	91.75	0.
91.755	253.96	92.25	228.82
92.75	204.66	93.25	181.61
93.75	159.5	94.25	138.21
94.75	117.62	95.25	97.61
95.75	78.01	96.25	58.67
96.75	39.39	97.25	19.67
97.75	0.	1000000.	0.

Control Variables							
CV #	Description	Type	Initial Value	Coeff. G	Coeff. a0	Min	Max
1	Hx and CFC He	sum	0.	1.	0.	-1e+03	1e+032
2	Total Heat Re	integ	0.	1.	0.	-1e+03	1e+032

Control Variable # Hx and CFC Heat Load sum Y=G*(a0+a1X1+a2X2+...+anXn)			
#	Gothic_s Name	Variable location	Coef. a
1	qhxa(1)	cX1H	1.
2	htq	cH1C	1.

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Control Variable # Total Heat Removed integ Y=G*integ((a0+a1X1)dt)			
#	Gothic_s Name	Variable location	Coef. a
1	cvval	cv1	1.

Volume Initial Conditions							
Vol #	Pressure (psia)	Vapor Temp. (F)	Liquid Temp. (F)	Relative Humidity (%)	Liquid Volume Fractio	Ice Volume Fracti	Ice Surf. A (ft2)
def	15.7	120.	120.	50.	0.	0.	0.

Initial Gas Pressure Ratios								
Vol #	Air Gas 1	N2 Gas 2	Gas 3	Gas 4	Gas 5	Gas 6	Gas 7	Gas 8
def	1.	0.	0.	0.	0.	0.	0.	0.

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Run Control Parameters (Seconds)								
Time Int	DT Min	DT Max	DT Ratio	End Time	Print Int	Graph Int	Max CPU	Dump Int
1	0.001	0.01	1.	0.5	1e+007	0.1	2500.	0.
2	0.001	0.1	1.	10.	1e+007	0.5	1000.	0.
3	0.01	0.1	1.	20.	1e+007	0.25	2000.	0.
4	0.01	0.25	1.	270.	1e+007	2.	2000.	0.
5	0.01	0.25	1.	330.	1e+007	0.5	3000.	0.
6	0.01	0.5	1.	1520.	1e+007	30.	2000.	0.
7	0.01	0.5	1.	1600.	1e+007	10.	3000.	0.
8	0.01	1.	1.	10000.	1e+007	150.	25000.	0.
9	0.01	1.5	1.	87000.	1e+007	600.	90000.	0.
10	0.01	5.	1.	1e+006	1e+007	1800.	90000.	0.

Run Parameters Menu	
Parameter	Value
Restart Time (sec)	0
Restart Time Step #	0
Restart Time Control	NEW
Revap. Fraction	1e-006
Hetero. Nucleation?	YES
Min. NC HT Coeff. (Btu/ft2-hr-F)	0
Reference Pressure (psia)	0
Forced Ent. Drop Dia. (ft)	0.00833
Vaper Phase Head Cor.?	NO
Solution Method	DIRECT
Include Kinetic Energy?	NO

Ice Condenser Parameters			
Initial Temp. (F)	Bulk Density (lbm/ft3)	Surface Area Multiplier Function	Heat Transfer Option
0.	0.		UCHIDA

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Graphs

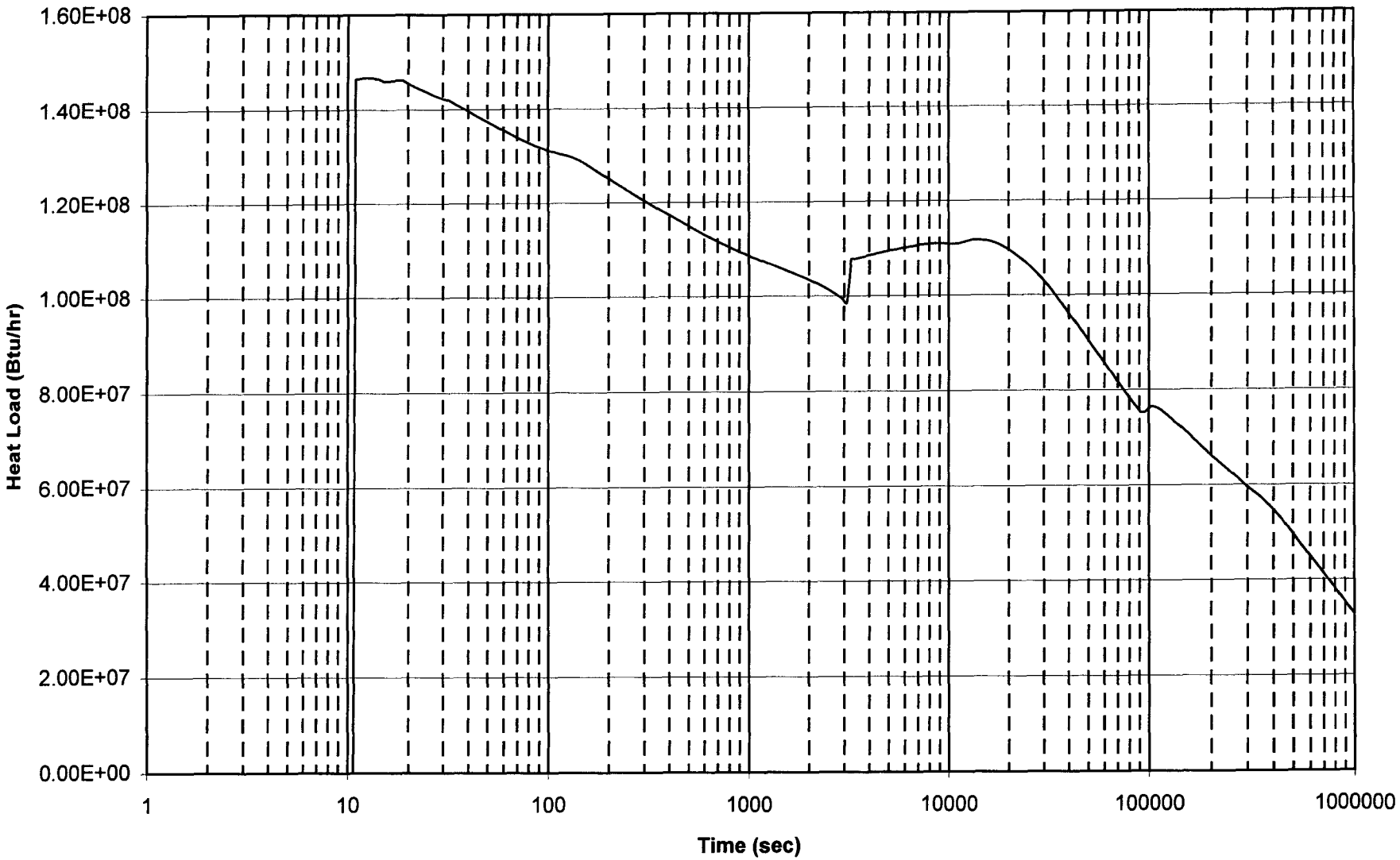
Graph #	Title	Mon	Curve Number 1	2	3	4	5
1	Figure 1: Cont.		PR1				
2	Figure 2: Cont.		TV1	TL2			
3	SDCHX Parameter		T11H	t11H	T21H	t21H	
4	Figure 3: Condu		TA1	TA4	TA6	TA16	
5	Figure 4: Therm		HA1	hA4	HA6	HA16	
6	Pressure Fracti		1R1	9R1			
7	Figure 5: Blowd		FV2	FV8	FL6		
8	Spray Flows		FD3	FL5			
9	Sump Liquid Lev		LL1	LL2			
10	Figure 6: SDC H		xq1H	CQ1C			
11	Total Heat Load		cv1				
12	Total Heat Load		cv1	cv2			

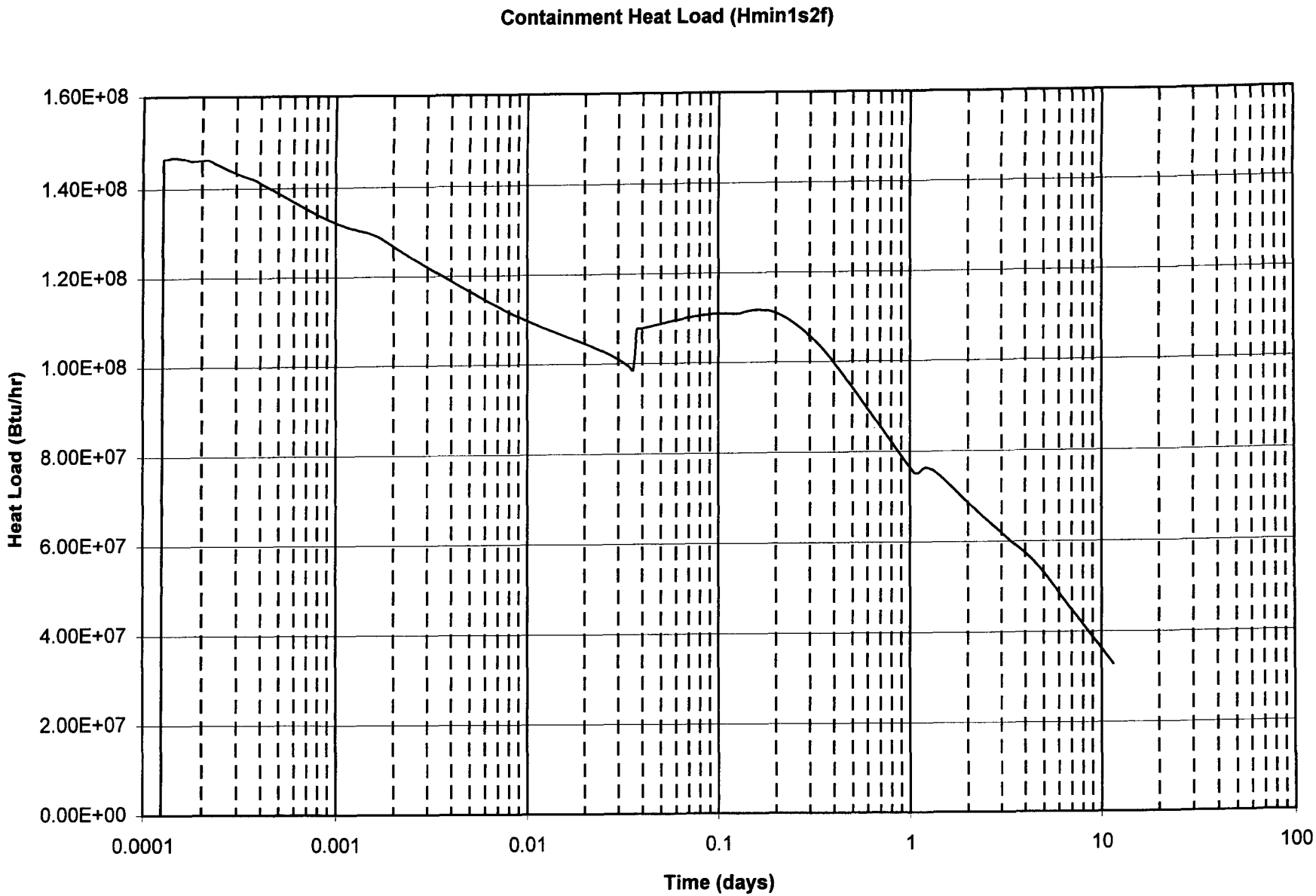
Noncondensing Gases

Gas No.	Description	Symbol	Type	Mol. Weight	Lennard-Jones Parameters Diameter (Ang)	e/K (K)
1	Air	Air	POLY	28.97	3.617	97.
2	Nitrogen	N2	POLY	28.02	3.681	91.5

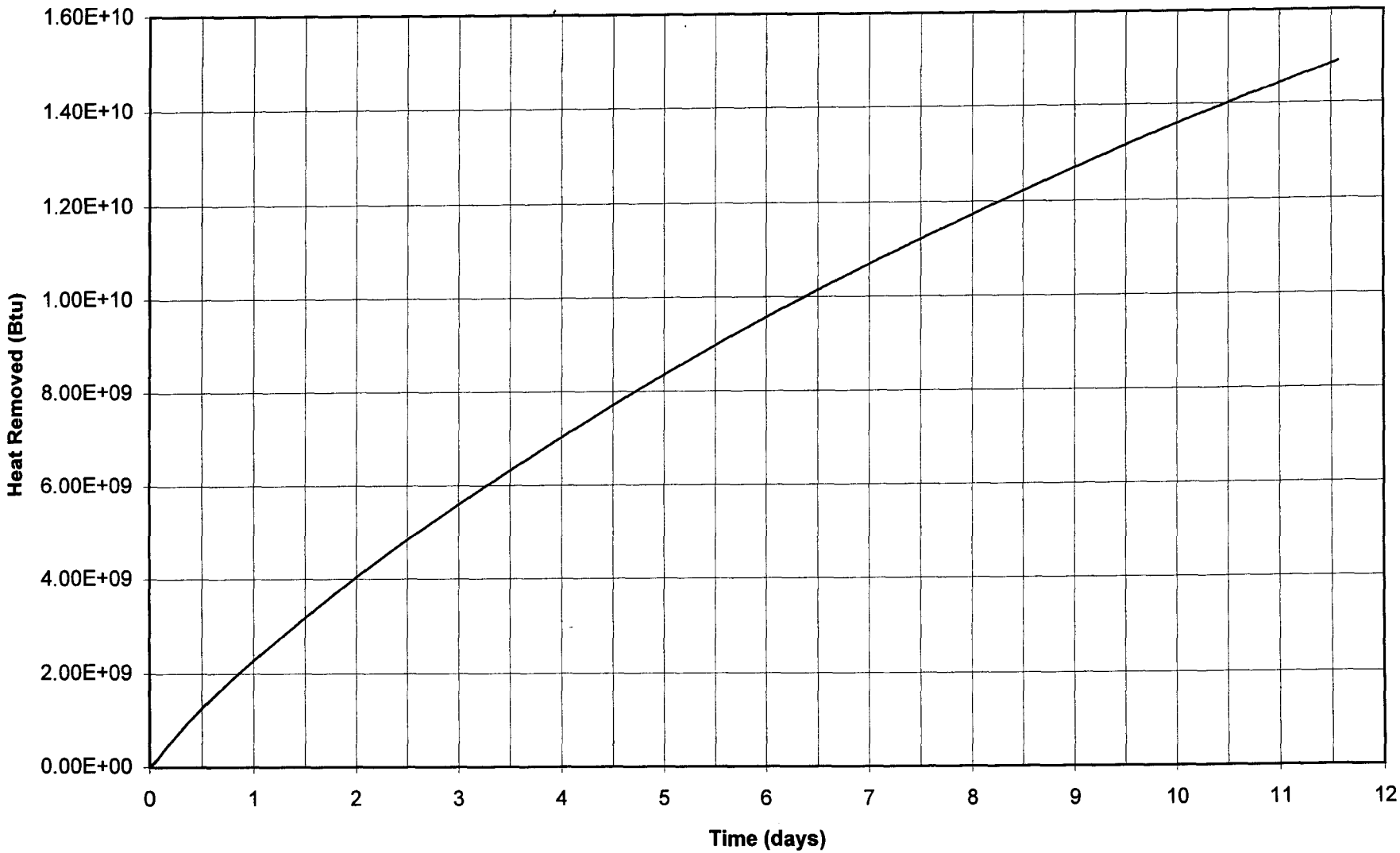
Noncondensing Gases - Cp/Visc. Equations

Gas No.	Cp Equation (Required) Tmin (R)	Tmax (R)	Cp (Btu/lbm-R)	Visc. Equation (Optional) Tmin (R)	Tmax (R)	Viscosity (lbm/ft-hr)
1	360.	2880.	0.238534-6.2006			
2	180.	5400.	0.413186-8.7659			


Containment Heat Load (Hmin1s2f)
Heat Load (Btu/hr)
1.60E+08
1.40E+08
1.20E+08
1.00E+08
8.00E+07
6.00E+07
4.00E+07
2.00E+07
0.00E+00
1
10
100
1000
10000
100000
1000000
Time (sec)


Containment Heat Load (Hmin1s2f)
Heat Load (Btu/hr)
1.60E+08
1.40E+08
1.20E+08
1.00E+08
8.00E+07
6.00E+07
4.00E+07
2.00E+07
0.00E+00
0.0001
0.001
0.01
0.1
1
10
100
Time (days)

Integrated Containment Heat Load (Hmin1s2f)



Attachment III

Dmax1s2f

Attachment III to EC-S01-005 - Dmax1s2f
Aug/01/2001 14:33:08
GOTHIC Version 6.1(QA) - July 1999

Control Volumes

Vol #	Description	Vol (ft3)	Elev (ft)	Ht (ft)	Hyd. D. (ft)	L/V IA (ft)	Burn Opt
1	RCB Atmosphere	2580000.	35.	208.	70.	DEFAULT	NONE
2	RCB Sump	97000.	19.	16.	5.	15000.	NONE

Laminar Leakage

Vol #	Leak Rate Factor (%/hr)	Ref Press (psia)	Ref Temp (F)	Ref Humid (%)	Sink/ Source BC	Model Option	Rep Wall	Subvol Option	Leak Area (ft2)
1	0.								DEFAULT
2	0.								DEFAULT

Turbulent Leakage

Vol #	Leak Rate Factor (%/hr)	Ref Press (psia)	Ref Temp (F)	Ref Humid (%)	Sink/ Source BC	Model Option	Rep Wall	Subvol Option	Leak Area (ft2)	fL/D
1	0.							UNIFORM	DEFAULT	
2	0.							UNIFORM	DEFAULT	

Fluid Boundary Conditions - Table 1

BC#	Description	Press. (psia)	FF	Temp. (F)	FF	Flow (lbm/s)	FF	On Trip	Off Trip
1F	Blowdown Flow	1.	3	E1.0	2	1.0	1	0	
2F	Spray: pre-RAS	14.7	0	100.00		242.17	5	2	
3F	Sump Suction	14.7				v-4.01	10	0	
4C	Spray: Recirc	14.7						0	
5F	Long Term Liqui	14.7		E1.0	9	1.0	8		
6F	Sump Liquid Rem	14.7		0	0	1.0	11		
7F	Reflood Steam F	1.	3	E1.0	13	1.0	12	0	
8F	LT Steam Releas	1.	3	E1.0	15	1.0	14	0	
9F	Reflood Spillag	1.	3	E1.0	17	1.0	16	0	
10F	SI Pump Spillag	14.7		100	0	1.0	18		
11F	SIT Spillage	14.7		E89.81	0	1.0	19		
12F	Nitrogen Releas	100.	0	120	0	1.0	20	0	

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Fluid Boundary Conditions - Table 2

BC#	Liq. V. Frac.	FF	Stm. P.R.	FF	Drop D (in)	FF	Cpld BC#	Flow Frac.	FF	Heat (Btu/s)	FF	Outlet Quality	FF
1F	0.		1.0000		0.0039	0						DEFAULT	
2F	1.		1.0000		0.0276							DEFAULT	
3F	1.		1.0000		NONE							DEFAULT	
4C	1.		1.0000		NONE		3F	1.		0.		DEFAULT	
5F	1.		1.0000		NONE							DEFAULT	
6F	1.		1.0000		NONE							DEFAULT	
7F	0.		1.0000		0.0039	0						DEFAULT	
8F	0.		1.0000		0.0039	0						DEFAULT	
9F	1.		1.0		NONE	0						DEFAULT	
10F	1.		1.0000		NONE							DEFAULT	
11F	1.		1.0000		NONE							DEFAULT	
12F	0.		0		NONE							DEFAULT	

Fluid Boundary Conditions - Table 3
Gas Pressure Ratios

BC#	Air Gas 1	FF	N2 Gas 2	FF	Gas 3	FF	Gas 4	FF
1F	0.		0.		0.		0.	
2F	0.		0.		0.		0.	
3F	0.		0.		0.		0.	
4C	0.		0.		0.		0.	
5F	0.		0.		0.		0.	
6F	0.		0.		0.		0.	
7F	0.		0.		0.		0.	
8F	0.		0.		0.		0.	
9F	0.		0.		0.		0.	
10F	0.		0.		0.		0.	
11F	0.		0.		0.		0.	
12F	0.		1.					

Fluid Boundary Conditions - Table 4
Gas Pressure Ratios

BC#	Gas 5	FF	Gas 6	FF	Gas 7	FF	Gas 8	FF
1F	0.		0.		0.		0.	
2F	0.		0.		0.		0.	
3F	0.		0.		0.		0.	
4C	0.		0.		0.		0.	
5F	0.		0.		0.		0.	
6F	0.		0.		0.		0.	
7F	0.		0.		0.		0.	
8F	0.		0.		0.		0.	
9F	0.		0.		0.		0.	
10F	0.		0.		0.		0.	
11F	0.		0.		0.		0.	

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Fluid Boundary Conditions - Table 4
Gas Pressure Ratios

BC#	Gas 5	FF	Gas 6	FF	Gas 7	FF	Gas 8	FF
12F								

Flow Paths - Table 1

F.P. #	Description	Vol A	Elev (ft)	Ht (ft)	Vol B	Elev (ft)	Ht (ft)
1	RCB Open Space	1	35.15	0.35	2	34.89	0.1
2	Blowdown Flow	1	47.125	2.5	1F	47.125	2.5
3	Spray:pre-RAS	1	220.	0.5	2F	220.	0.5
4	Sump Suction Fl	2	20.75	2.	3F	20.75	2.
5	Spray: Recirc	1	220.	0.5	4C	220.	0.5
6	LT Liq.to Sump	2	20.75	2.5	5F	20.75	2.5
7	Liq Removal Fro	2	20.75	2.5	6F	20.75	2.5
8	Reflood Steam F	1	47.125	2.5	7F	47.125	2.5
9	LT Steam Flow	1	47.125	2.5	8F	47.125	2.5
10	Reflood Spillag	2	20.75	2.5	9F	20.75	2.5
11	SI Pump Spillag	2	20.75	2.5	10F	20.75	2.5
12	SIT Spillage	2	20.75	2.5	11F	20.75	2.5
13	Nitrogen	1	47.125	2.5	12F	47.125	2.5

Flow Paths - Table 2

Flow Path #	Flow Area (ft2)	Hyd. Diam. (ft)	Inertia Length (ft)	Friction Length (ft)	De-Entrmt Frac.	Mom Trn Opt	Strat Flow Opt
1	10000.	15.	112.	0.25	0.	-	NONE
2	9.817	2.5	10.	0.		-	NONE
3	0.4481	0.7553	200.	0.		-	NONE
4	3.14	2.	25.	0.		-	NONE
5	0.4481	0.7553	200.	0.		-	NONE
6	9.817	2.5	10.	0.		-	NONE
7	1000.	15.	10.	0.		-	NONE
8	9.817	2.5	10.	0.		-	NONE
9	9.817	2.5	10.	0.		-	NONE
10	9.817	2.5	10.	0.		-	NONE
11	9.817	2.5	10.	0.		-	NONE
12	9.817	2.5	10.	0.		-	NONE
13	9.817	2.5	10.	0.		-	NONE

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Flow Paths - Table 3

Flow Path #	Fwd. Loss Coeff.	Rev. Loss Coeff.	Comp. Opt.	Critical Flow Model	Exit Loss Coeff.
1	0.01	0.01	OFF	OFF	0.
2	0.	0.	OFF	OFF	0.
3	0.	0.	OFF	OFF	0.
4	0.	0.	OFF	OFF	0.
5	0.	0.	OFF	OFF	0.
6	0.	0.	OFF	OFF	0.
7	0.	0.	OFF	OFF	0.
8	0.	0.	OFF	OFF	0.
9	0.	0.	OFF	OFF	0.
10	0.	0.	OFF	OFF	0.
11	0.	0.	OFF	OFF	0.
12	0.	0.	OFF	OFF	0.
13	0.	0.	OFF	OFF	0.

Thermal Conductors

Cond #	Description	Vol A	HT Coef	Vol B	HT Coef	Cond Type	S. A. (ft2)	Init. T.(F)	Or
1	Cont.Wall	1	1	1	2	2	61400.	120.	X
2s	Base Concrete	2	3	2	2	3	15275.	120.	F
3	Cont.Dome	1	1	1	2	1	30500.	120.	X
4s	Thick Sump Conc	2	3	2	2	4	5296.	120.	F
5s	Thin Sump Conc.	2	3	2	2	5	3173.	120.	F
6	Thick Conc. Hi	1	1	1	2	7	9815.	120.	I
7	Thin Conc. Hi	1	1	1	2	6	47192.	120.	I
8	SS:Ref.Pool etc	1	1	1	2	8	28860.	120.	I
9	Galv.Steel 37.5	1	1	1	2	9	26266.	120.	I
10	Galv.Steel 78.3	1	1	1	2	10	153503.	120.	I
11	Galv.Steel .4"	1	1	1	2	11	9405.	120.	I
12	Misc.St. 71	1	1	1	2	12	92006.	120.	I
13	Misc.St. .16"	1	1	1	2	13	87292.5	120.	I
14	Misc.St. .41"	1	1	1	2	14	186484.	120.	I
15	Misc.St. .74"	1	1	1	2	15	30993.	120.	I
16	Misc.St. 1.7"	1	1	1	2	16	22655.	120.	I

Thermal Conductors - Table 2

Cond #	Therm. Rad. Side A	Emiss. Side A	Therm. Rad. Side B	Emiss. Side B
1	No		No	
2s	No		No	
3	No		No	
4s	No		No	
5s	No		No	
6	No		No	
7	No		No	

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Thermal Conductors - Table 2

Cond #	Therm. Rad. Side A	Emiss. Side A	Therm. Rad. Side B	Emiss. Side B
8	No		No	
9	No		No	
10	No		No	
11	No		No	
12	No		No	
13	No		No	
14	No		No	
15	No		No	
16	No		No	

Heat Transfer Coefficient Types - Table 1

Type #	Heat Transfer Option	Nominal Value	FF	Cnd Cnv Opt	Cnd Opt	Sp Cnv HTC	Nat Cnv Opt	For Cnv Opt	Rad Opt
1	Tagami		0	XOR	UCHI		VERT SURF	OFF	OFF
2	Sp Heat	0.	-		UCHI	0.0			OFF
3	Sp Conv	10.	0		-	0.0	OFF	OFF	OFF

Heat Transfer Coefficient Types - Table 2

Type #	Phase Opt	Min Liq Fract	Max Liq Fract	Convect Bulk T Model	FF	Condensa Bulk T Model	FF
1	VAP			Tg-Tf		Tb-Tw	
2	Vecto						
3	LIQ	0.	1.	Tg-Tw			

Heat Transfer Coefficient Types - Table 3

Type #	Char. Length (ft)	Nat Coef FF	Exp FF	For Coef FF	Exp FF	Nom Vel (ft/s)	Vel FF	Minimum Conv HTC (Btu/hr-ft
1								DEFAULT
2								
3								

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HTC Types - Table 4

Type #	Total Heat (Btu)	Peak Time (sec)	Initial Value (Btu/hr-ft	Post-BD Direct FF
1	307010000.	15.1		
2				
3				

Thermal Conductor Types

Type #	Description	Geom	Thick. (in)	O.D. (in)	Regions	Heat (Btu/ft3-s)	Heat FF
1	Cont.Dome	TUBE	0.968	1681.936	7		
2	ContainmentWall	TUBE	1.918	1683.836	8		
3	Base Concrete	WALL	137.656	-	15		
4	Thick Conc. Lo	WALL	54.256	-	13		
5	Thin Conc. Lo	WALL	17.3680	-	12		
6	Thin Conc. Hi	WALL	19.744	-	12		
7	Thick Conc. Hi	WALL	42.616	-	13		
8	Stainless .228	WALL	0.22664	-	2		
9	Galv.St. 37.55	WALL	0.04698	-	2		
10	Galv.Steel 78.3	WALL	0.07932	-	2		
11	Galv.Steel 432.	WALL	0.4343	-	4		
12	71 Steel	WALL	0.08018	-	2		
13	164 Steel	WALL	0.17361	-	2		
14	413 Steel	WALL	0.42172	-	4		
15	739 Steel	WALL	0.75083	-	5		
16	1.7" Steel	WALL	1.6874	-	6		
17	Stainless 0.024	WALL	0.0240	-	1		

Thermal Conductor Type
1
Cont.Dome

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	4	0.000	0.007	2	0.
2	3	0.0070	0.005	1	0.
3	1	0.0120	0.050	2	0.
4	1	0.0620	0.100	2	0.
5	1	0.1620	0.200	1	0.
6	1	0.3620	0.600	2	0.
7	3	0.9620	0.006	1	0.

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Thermal Conductor Type
2
ContainmentWall

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	4	0.0000	0.007	2	0.
2	3	0.007	0.005	1	0.
3	1	0.012	0.050	2	0.
4	1	0.062	0.100	2	0.
5	1	0.162	0.200	1	0.
6	1	0.362	0.400	1	0.
7	1	0.762	01.150	2	0.
8	3	1.912	0.006	1	0.

Thermal Conductor Type
3
Base Concrete

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	5	0.0000	0.0160	4	0.
2	2	0.0160	0.010000	2	0.
3	2	0.0260	0.0200	2	0.
4	2	0.0460	0.0400	1	0.
5	2	0.0860	0.0800	1	0.
6	2	0.1660	0.1600	1	0.
7	2	0.3260	0.3200	1	0.
8	2	0.6460	0.6400	1	0.
9	2	1.2860	1.2800	1	0.
10	2	2.5660	2.5600	1	0.
11	2	5.1260	5.1200	1	0.
12	2	10.2460	10.2400	1	0.
13	2	20.4860	20.4800	1	0.
14	2	40.966	40.9600	1	0.
15	2	81.9260	55.7300	1	0.

Thermal Conductor Type
4
Thick Conc. Lo

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	5	0.000	0.016	4	0.
2	2	0.016	0.010	1	0.
3	2	0.026	0.020	1	0.
4	2	0.046	0.040	1	0.
5	2	0.086	0.080	1	0.
6	2	0.166	0.160	1	0.
7	2	0.326	0.320	1	0.
8	2	0.646	0.640	1	0.

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Thermal Conductor Type
4
Thick Conc. Lo

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
9	2	1.286	1.280	1	0.
10	2	2.566	2.560	1	0.
11	2	5.126	5.120	1	0.
12	2	10.246	10.240	1	0.
13	2	20.486	33.770	2	0.

Thermal Conductor Type
5
Thin Conc. Lo

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	5	0.0000	0.016	4	0.
2	2	0.0160	0.010	1	0.
3	2	0.0260	0.020	1	0.
4	2	0.0460	0.040	1	0.
5	2	0.0860	0.080	1	0.
6	2	0.1660	0.160	1	0.
7	2	0.3260	0.320	1	0.
8	2	0.6460	0.640	1	0.
9	2	1.2860	1.280	1	0.
10	2	2.5660	2.560	1	0.
11	2	5.1260	5.120	1	0.
12	2	10.2460	7.1220	1	0.

Thermal Conductor Type
6
Thin Conc. Hi

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	5	0.0	0.016	4	0.
2	2	0.0160	0.010	1	0.
3	2	0.0260	0.020	1	0.
4	2	0.0460	0.040	1	0.
5	2	0.0860	0.080	1	0.
6	2	0.1660	0.160	1	0.
7	2	0.3260	0.320	1	0.
8	2	0.6460	0.640	1	0.
9	2	1.2860	1.280	1	0.
10	2	2.5660	2.560	1	0.
11	2	5.1260	5.120	1	0.
12	2	10.2460	9.498	1	0.

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Thermal Conductor Type
7
Thick Conc. Hi

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	5	0.0	0.016	4	0.
2	2	0.0160	0.010	1	0.
3	2	0.0260	0.020	1	0.
4	2	0.0460	0.040	1	0.
5	2	0.0860	0.080	1	0.
6	2	0.1660	0.160	1	0.
7	2	0.3260	0.320	1	0.
8	2	0.6460	0.640	1	0.
9	2	1.2860	1.280	1	0.
10	2	2.5660	2.560	1	0.
11	2	5.1260	5.120	1	0.
12	2	10.2460	10.240	1	0.
13	2	20.4860	22.130	1	0.

Thermal Conductor Type
8
Stainless .228

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	6	0.0000	0.050000	1	0.
2	6	0.050000	0.17664	2	0.

Thermal Conductor Type
9
Galv.Steel 37.5

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	7	0.0000	0.004000	1	0.
2	1	0.004000	0.04298	2	0.

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Thermal Conductor Type
10
Galv.Steel 78.3

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	7	0.0	0.00080	1	0.
2	1	0.00080	0.07852	2	0.

Thermal Conductor Type
11
Galv.Steel 432.

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	7	0.0000	0.002000	1	0.
2	1	0.002000	0.050000	2	0.
3	1	0.052000	0.099000	1	0.
4	1	0.151000	0.283300	1	0.

Thermal Conductor Type
12
71 Steel

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	8	0.0000	0.009000	2	0.
2	1	0.009000	0.071180	2	0.

Thermal Conductor Type
13
164 Steel

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	8	0.000	0.009000	2	0.
2	1	0.009000	0.16461	3	0.

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Thermal Conductor Type
14
413 Steel

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	8	0.0	0.0090	2	0.
2	1	0.0090	0.050000	2	0.
3	1	0.059000	0.092000	2	0.
4	1	0.151000	0.27072	2	0.

Thermal Conductor Type
15
739 Steel

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	8	0.00	0.0090	2	0.
2	1	0.0090	0.050000	2	0.
3	1	0.059000	0.101000	2	0.
4	1	0.160000	0.201000	1	0.
5	1	0.361000	0.38983	1	0.

Thermal Conductor Type
16
1.7" Steel

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	8	0.0	0.0090	2	0.
2	1	0.0090	0.050000	2	0.
3	1	0.059000	0.100000	2	0.
4	1	0.159000	0.202000	1	0.
5	1	0.361000	0.403000	1	0.
6	1	0.764000	0.923400	1	0.

Thermal Conductor Type
17
Stainless 0.024

Region	Mat. #	Bdry. (in)	Thick (in)	Sub-regs.	Heat Factor
1	6	0.0000	0.024000	2	0.

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Cooler/Heater

Heater Cooler #	Description	Vol. #	On Trip #	Off Trip #	Flow Rate (CFM)	Flow Rate FF	Heat Rate (Btu/s)	Heat Rate FF	Phs Opt	Ctrlr Loc
1C	Cooler	1	1		90000.	0	2.	4	VTS	1

Heat Exchangers - Table 1

Heat Ex. #	Description	HX Type #	Prim Flow Path	Scnd Flow Path	Cpld HX #
1H	SDC HX	1	5	SPEC	

Heat Exchangers - Table 2

Heat Ex. #	Scndy Flow (lbm/s)	Scnd Flow FF	Scndy Temp (F)	Scnd Temp FF	Ext. Flow (lbm/s)	Ext. Flow FF	Ext. Heat (Btu/s)	Ext. Heat FF
1H	410.9		112.		0.		0.	

Heat Exchanger Types - Table 1

HX Type #	Option	Passes or Zones	Tube Mat. Type #	Thick-ness (in)	Wall Area (ft2)
1	TUBE-SHELL	1	9	0.049	7000.

Heat Exchanger Types - Table 2

HX Type #	Side	Fin Type	Flow Area (ft2)	Hyd. Diam. (in)	Tot. S. Area (ft2)	H.T. Coef Curv	H.T. Coef Type	Fouling Resistance (h-f2-F/B)
1	PRIM	NONE	1.718	0.6485	6053.	6	TIME	
	seco	NONE	8.066	2.44	7000.	7	TIME	

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Heat Exchanger Types - Table 3
Fin Parameters

HX Type #	Side	Fin Mat. Type #	Pin Diam. (in)	Length (in)	Thick-ness (in)	Surf. Area (ft2)
1	prim	0	0.	0.	0.	0.
	SECO	0	0.	0.	0.	0.

Spray Nozzles

Nozzle #	Description	Flow Path #	Dis. Vol. #	Drop Dia. (in.)	Drop Dia. FF	Spray Flow Frac.	Flow Frac. FF
1N	RCB Spray:RAS	5	1	0.0276		1.	

Volume Initial Conditions

Vol #	Pressure (psia)	Vapor Temp. (F)	Liquid Temp. (F)	Relative Humidity (%)	Liquid Volume Fractio	Ice Volume Fracti	Ice Surf. A (ft2)
def	15.7	120.	120.	50.	0.	0.	0.

Initial Gas Pressure Ratios

Vol #	Air Gas 1	N2 Gas 2	Gas 3	Gas 4	Gas 5	Gas 6	Gas 7	Gas 8
def	1.	0.	0.	0.	0.	0.	0.	0.

Noncondensing Gases

Gas No.	Description	Symbol	Type	Mol. Weight	Lennard-Jones Parameters Diameter (Ang)	e/K (K)
1	Air	Air	POLY	28.97	3.617	97.
2	Nitrogen	N2	POLY	28.02	3.681	91.5

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Noncondensing Gases - Cp/Visc. Equations

Gas No.	Cp Equation (Required) Tmin (R)	Tmax (R)	Cp (Btu/lbm-R)	Visc. Equation (Optional) Tmin (R)	Tmax (R)	Viscosity (lbm/ft-hr)
1	360.	2880.	0.238534-6.2006			
2	180.	5400.	0.413186-8.7659			

Materials

Type #	Description
1	Carbon Steel
2	Concrete
3	Paint 1 (bottom coat)
4	Paint 2 (top coat)
5	Paint Film
6	Stainless Steel
7	Zinc
8	Paint on Misc. Steel
9	Type 304 Stainless Steel

Material Type
1
Carbon Steel

Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	489.	25.9	0.10955
1000.	489.	25.9	0.10955

Material Type
2
Concrete

Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	115.	1.	0.2774
1000.	115.	1.	0.2774

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Material Type
3
Paint 1 (bottom coat)

Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	68.64	0.083	0.286
1000.	68.64	0.083	0.286

Material Type
4
Paint 2 (top coat)

Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	68.64	1.5	0.1919
1000.	68.64	1.5	0.1919

Material Type
5
Paint Film

Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	68.64	0.156	0.4079
1000.	68.64	0.156	0.4079

Material Type
6
Stainless Steel

Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	490.	9.8	0.11
1000.	490.	9.8	0.11

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Material Type 7 Zinc			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	446.	64.	0.091
1000.	446.	64.	0.091

Material Type 8 Paint on Misc. Steel			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	68.64	0.235	0.558
1000.	68.64	0.235	0.558

Material Type 9 Type 304 Stainless Steel			
Temp. (F)	Density (lbm/ft3)	Cond. (Btu/hr-ft-F)	Sp. Heat (Btu/lbm-F)
0.	487.8	8.99	0.11
1000.	487.8	8.99	0.11

Ice Condenser Parameters			
Initial Temp. (F)	Bulk Density (lbm/ft3)	Surface Area Multiplier Function	Heat Transfer Option
0.	0.		UCHIDA

Component Trips										
Trip #	Description	Sense Var.	Sensor 1 Loc.	Sensor 2 Loc.	Var. Limit	Set Point	Delay Time	Rset Trip	Cond Trip	Cond Type
1		PRESS	1	-	UPPER	19.7	10	-	-	AND
2		PRESS	1		UPPER	19.7	1			AND

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Functions

FF#	Description	Ind. Var.	Dep. Var.	Points
0	Constant	-	-	0
1	Blowdown Flow	Time (Sec)	Flow (lb/s	49
2	Blowdown Enthal	Time(sec)	h (BTU/lb)	49
3	DESLB RCS Psia	Time(sec)	RCS Pressu	21
4	CFC Cooling	RCB Temp.	CFC Heat T	8
5	Pre-RAS CS Cont	Time(sec)	PreRAS CSS	12
6	SDCHX Tube h	Time(s)	h (BTU/hrf	4
7	SDCHX Shell h	Time(s)	h (BTU/hrf	4
8	LT Liq. Flow To	Time (s)	Flow (lb/s	154
9	LT Liq. Enthalp	Time (s)	h (Btu/lbm	154
10	Sump Recirc Flo	Time(s)	Flow On/Of	4
11	Sump Liquid Rem	Time (s)	Flow (lbm/	76
12	Reflood Steam F	Time (Sec)	Flow (lb/s	54
13	Reflood Steam E	Time(sec)	h (Btu/lb)	55
14	LT Steam Mass R	Time(sec)	Flow (lb/s	154
15	LT Steam Enthal	Time(s)	h (Btu/lb)	154
16	Reflood Spillag	Time(sec)	Flow (lb/s	53
17	Reflood Spillag	Time (sec)	h (Btu/lb)	54
18	SI Pump Spillag	Time (sec)	flow (lb/s	6
19	SIT Spillage	time (sec0	flow (lb/s	4
20	Nitrogen Releas	time (sec)	flow (lb/s	16

Function
1
Blowdown Flow
Ind. Var.: Time (Sec)
Dep. Var.: Flow (lb/s)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	0.5	113010.
1.	104670.	1.5	88519.
2.	74117.	2.5	62408.
3.	56308.	4.	49799.
5.	33050.	6.	31626.
7.	27883.	8.	21078.
9.	11054.	10.	11684.
11.	13777.	12.	13586.
12.1	13264.	12.2	12972.
12.3	12731.	12.4	12435.
12.5	12150.	12.6	11887.
12.7	11586.	12.8	11283.
12.9	10991.	13.	10919.
13.1	10796.	13.2	10640.
13.3	10341.	13.4	9974.6
13.5	9566.	13.6	10166.
13.7	4500.	13.8	9564.9
13.9	9845.5	14.	4225.2
14.1	4074.6	14.2	4071.4
14.3	3927.3	14.4	3313.5
14.5	2833.8	14.6	2417.8
14.7	1983.	14.8	1498.4

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Function
1
Blowdown Flow
Ind. Var.: Time (Sec)
Dep. Var.: Flow (lb/s)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
14.9	924.1	15.	355.44
15.1	0.	15.2	0.
1000000.	0.		

Function
2
Blowdown Enthalpy
Ind. Var.: Time(sec)
Dep. Var.: h (BTU/lb)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	546.55	0.5	546.55
1.	547.99	1.5	557.58
2.	564.62	2.5	565.55
3.	565.08	4.	578.97
5.	686.42	6.	665.63
7.	671.96	8.	728.11
9.	914.91	10.	833.89
11.	598.96	12.	462.37
12.1	452.9	12.2	443.79
12.3	434.98	12.4	426.36
12.5	417.87	12.6	409.76
12.7	401.94	12.8	394.44
12.9	387.24	13.	380.23
13.1	372.47	13.2	365.3
13.3	358.34	13.4	352.16
13.5	346.35	13.6	341.73
13.7	334.33	13.8	331.65
13.9	328.92	14.	323.68
14.1	321.33	14.2	319.93
14.3	319.63	14.4	322.38
14.5	323.83	14.6	324.62
14.7	326.35	14.8	330.64
14.9	342.48	15.	389.27
15.1	389.27	15.2	100.
1000000.	100.		

Function
3
DESLB RCS Psia
Ind. Var.: Time(sec)
Dep. Var.: RCS Pressure (psia)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	2315.	0.5	913.5
1.	716.63	1.5	632.66
2.	599.06	2.5	571.56
3.	543.7	4.	497.04
5.	443.13	6.	385.3
7.	323.51	8.	266.7
9.	188.1	10.	153.66
11.	113.65	12.	72.6
13.	78.26	14.	64.34
15.	55.22	15.1	20.
1000000.	20.		

Function
4
CFC Cooling
Ind. Var.: RCB Temp. (F)
Dep. Var.: CFC Heat Tfer(BTU/s)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
20.	0.	129.99	0.
130.	1376.6	150.	3392.13
200.	10582.	251.	19751.
261.	21590.	1000000.	21590.

Function
5
Pre-RAS CS Control
Ind. Var.: Time(sec)
Dep. Var.: PreRAS CSS On/Off

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	31.56	0.
31.57	0.169789	35.57	0.169789
35.58	0.328612	38.27	0.328612
38.28	0.407424	39.21	0.407424
39.22	1.	1881.38	1.
1881.39	0.	1000000.	0.

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Function
6
SDCHX Tube h
Ind. Var.: Time(s)
Dep. Var.: h (BTU/hrft2F)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	1881.39	0.
1881.4	855.65	1000000.	855.65

Function
7
SDCHX Shell h
Ind. Var.: Time(s)
Dep. Var.: h (BTU/hrft2F)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	1881.39	0.
1881.4	1344.15	1000000.	1344.15

Function
8
LT Liq. Flow To Sump
Ind. Var.: Time (s)
Dep. Var.: Flow (lb/s)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	279.158	0.
279.258	1288.89	279.307	1287.54
279.358	1278.4	279.408	1276.24
279.457	1276.46	279.508	1276.44
279.557	1276.45	279.608	1276.46
279.658	1276.47	279.707	1276.47
279.758	1276.48	279.807	1276.49
279.858	1276.49	279.908	1276.5
279.957	1276.51	280.008	1276.51
280.057	1276.52	280.108	1276.53
280.158	1276.53	280.207	1276.54
280.258	1276.55	280.307	1276.55
280.358	1276.56	280.408	1276.57
280.457	1276.57	280.508	1276.58
280.557	1276.59	280.608	1276.59
280.658	1276.6	280.707	1276.61
280.758	1276.62	280.807	1276.62
280.858	1276.63	280.908	1276.64
280.957	1276.64	281.008	1276.65
281.057	1276.66	281.108	1276.66
281.158	1276.67	281.207	1276.68
281.258	1276.68	281.307	1276.69
281.358	1276.7	281.408	1276.7
281.457	1276.71	281.508	1276.72

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Function
8
LT Liq. Flow To Sump
Ind. Var.: Time (s)
Dep. Var.: Flow (lb/s)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
281.557	1276.72	281.608	1276.73
281.658	1276.74	281.707	1276.74
281.758	1276.75	291.608	1276.07
301.508	1277.34	311.408	1278.47
321.307	1279.56	331.158	1280.59
341.057	1281.58	350.957	1282.54
360.858	1283.4	370.758	1284.16
380.608	1284.88	390.508	1285.59
400.408	1286.28	410.307	1286.92
420.158	1287.55	430.057	1288.17
439.957	1288.78	449.858	1289.38
459.758	1289.94	469.608	1290.49
479.508	1291.03	489.408	1291.57
499.307	1292.09	684.008	1373.52
882.008	1380.82	1080.01	1385.81
1278.01	1389.58	1476.01	1392.96
1673.01	1395.99	1871.01	1398.75
2138.01	118.107	2534.01	121.996
2928.01	125.064	3324.01	127.581
3720.01	129.676	4116.01	131.442
4512.01	132.962	4906.01	134.24
5302.01	135.331	5698.01	136.335
6094.01	137.273	6488.01	138.041
6884.01	138.795	7280.01	139.453
7676.01	140.062	8072.01	140.648
8466.01	141.157	8862.01	141.659
9258.01	142.118	9654.01	142.549
10000.	142.921	10514.	143.027
11028.	143.092	11544.	143.142
12056.	143.214	12570.	143.528
13086.	143.864	13600.	144.206
14114.	144.54	14628.	144.833
15144.	145.124	15656.	145.412
16170.	145.691	16686.	145.945
17200.	146.197	17714.	146.449
18228.	146.687	18744.	146.905
19256.	147.12	19770.	147.335
22860.	148.433	27980.	149.992
33140.	151.235	38280.	152.259
43440.	153.141	48560.	153.905
53700.	154.556	58860.	155.17
63980.	155.709	69140.	156.229
74280.	156.677	79440.	157.111
84560.	157.492	89700.	157.867
94860.	157.154	99980.	156.357
100000.	156.354	132000.	157.939
164000.	159.107	196000.	160.006
228000.	160.686	260000.	161.307
292000.	161.844	360000.	162.738
440000.	163.946	520000.	165.213

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Function
8
LT Liq. Flow To Sump
Ind. Var.: Time (s)
Dep. Var.: Flow (lb/s)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
600000.	166.226	680000.	167.1
760000.	167.904	840000.	168.628
920000.	169.285	1000000.	169.868

Function
9
LT Liq. Enthalpy
Ind. Var.: Time (s)
Dep. Var.: h (Btu/lbm)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	100.	279.158	100.
279.258	67.9716	279.307	67.9716
279.358	67.9716	279.408	67.9716
279.457	67.9716	279.508	67.9716
279.557	67.9716	279.608	67.9716
279.658	67.9716	279.707	67.9716
279.758	67.9716	279.807	67.9716
279.858	67.9716	279.908	67.9716
279.957	67.9716	280.008	67.9716
280.057	67.9716	280.108	67.9716
280.158	67.9716	280.207	67.9716
280.258	67.9716	280.307	67.9716
280.358	67.9716	280.408	67.9716
280.457	67.9716	280.508	67.9716
280.557	67.9716	280.608	67.9716
280.658	67.9716	280.707	67.9716
280.758	67.9716	280.807	67.9716
280.858	67.9716	280.908	67.9716
280.957	67.9716	281.008	67.9716
281.057	67.9716	281.108	67.9716
281.158	67.9716	281.207	67.9716
281.258	67.9716	281.307	67.9716
281.358	67.9716	281.408	67.9716
281.457	67.9716	281.508	67.9716
281.557	67.9716	281.608	67.9716
281.658	67.9716	281.707	67.9716
281.758	67.9716	291.608	67.9716
301.508	67.9716	311.408	67.9716
321.307	67.9716	331.158	67.9716
341.057	67.9716	350.957	67.9716
360.858	67.9716	370.758	67.9716
380.608	67.9716	390.508	67.9716
400.408	67.9716	410.307	67.9716
420.158	67.9716	430.057	67.9716
439.957	67.9716	449.858	67.9716
459.758	67.9716	469.608	67.9716

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Function
9
LT Liq. Enthalpy
Ind. Var.: Time (s)
Dep. Var.: h (Btu/lbm)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
479.508	67.9716	489.408	67.9716
499.307	67.9716	684.008	67.9716
882.008	67.9716	1080.01	67.9716
1278.01	67.9716	1476.01	67.9716
1673.01	67.9716	1871.01	67.9716
2138.01	106.494	2534.01	107.505
2928.01	108.316	3324.01	108.988
3720.01	109.55	4116.01	110.029
4512.01	110.442	4906.01	110.8
5302.01	111.115	5698.01	111.392
6094.01	111.636	6488.01	111.85
6884.01	112.041	7280.01	112.208
7676.01	112.356	8072.01	112.485
8466.01	112.598	8862.01	112.696
9258.01	112.78	9654.01	112.852
10000.	112.905	10514.	112.97
11028.	113.025	11544.	113.071
12056.	113.11	12570.	113.143
13086.	113.168	13600.	113.183
14114.	113.188	14628.	113.185
15144.	113.174	15656.	113.155
16170.	113.13	16686.	113.097
17200.	113.06	17714.	113.016
18228.	112.968	18744.	112.915
19256.	112.858	19770.	112.797
22860.	112.369	27980.	111.509
33140.	110.575	38280.	109.655
43440.	108.779	48560.	107.972
53700.	107.23	58860.	106.556
63980.	105.948	69140.	105.392
74280.	104.888	79440.	104.43
84560.	104.015	89700.	103.635
94860.	103.357	99980.	103.271
100000.	103.271	132000.	102.701
164000.	101.847	196000.	101.138
228000.	100.594	260000.	100.131
292000.	99.7385	360000.	99.0686
440000.	98.3255	520000.	97.4194
600000.	96.7195	680000.	96.1068
760000.	95.5471	840000.	95.0443
920000.	94.5892	1000000.	94.1894

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Function
10
Sump Recirc Flow Fraction
Ind. Var.: Time(s)
Dep. Var.: Flow On/Off

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	1881.39	0.
1881.4	1.	1000000.	1.

Function
11
Sump Liquid Removal - Mass
Ind. Var.: Time (s)
Dep. Var.: Flow (lbm/s)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	1871.01	0.
1881.38	0.	1881.39	-178.28
2138.01	-178.98	2534.01	-178.98
2928.01	-178.98	3324.01	-178.98
3720.01	-178.98	4116.01	-178.98
4512.01	-178.98	4906.01	-178.98
5302.01	-178.98	5698.01	-178.98
6094.01	-178.98	6488.01	-178.98
6884.01	-178.98	7280.01	-178.98
7676.01	-178.98	8072.01	-178.98
8466.01	-178.98	8862.01	-178.98
9258.01	-178.98	9654.01	-178.98
10000.	-178.98	10514.	-178.98
11028.	-178.98	11544.	-178.98
12056.	-178.98	12570.	-178.98
13086.	-178.98	13600.	-178.98
14114.	-178.98	14628.	-178.98
15144.	-178.98	15656.	-178.98
16170.	-178.98	16686.	-178.98
17200.	-178.98	17714.	-178.98
18228.	-178.98	18744.	-178.98
19256.	-178.98	19770.	-178.98
22860.	-178.98	27980.	-178.98
33140.	-178.98	38280.	-178.98
43440.	-178.98	48560.	-178.98
53700.	-178.98	58860.	-178.98
63980.	-178.98	69140.	-178.98
74280.	-178.98	79440.	-178.98
84560.	-178.98	89700.	-178.98
94860.	-178.98	99980.	-178.98
100000.	-178.98	132000.	-178.98
164000.	-178.98	196000.	-178.98
228000.	-178.98	260000.	-178.98
292000.	-178.98	360000.	-178.98
440000.	-178.98	520000.	-178.98
600000.	-178.98	680000.	-178.98
760000.	-178.98	840000.	-178.98

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Function
11
Sump Liquid Removal - Mass
Ind. Var.: Time (s)
Dep. Var.: Flow (lbm/s)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
920000.	-178.98	1000000.	-178.98

Function
12
Reflood Steam Flow
Ind. Var.: Time (Sec)
Dep. Var.: Flow (lb/sec)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	15.11	0.
15.2	118.32	17.	356.88
18.6	589.49	20.	691.21
20.01	345.61	20.2	345.74
21.8	346.44	23.4	346.52
25.	346.2	26.6	345.64
28.2	344.93	29.8	344.17
31.4	343.38	33.	342.58
34.6	341.76	36.2	340.94
37.8	340.11	39.39	339.28
39.4	678.56	50.6	665.94
61.7	653.82	72.8	641.97
83.9	630.3	95.	618.77
106.1	607.26	117.2	595.64
128.3	583.99	139.4	572.24
150.5	560.16	161.6	548.21
172.7	536.14	183.8	488.88
194.9	426.72	206.	377.49
206.1	382.46	206.7	369.19
207.9	375.81	209.7	363.33
212.2	361.47	215.2	351.11
218.9	345.65	223.1	335.63
228.	328.45	233.5	282.96
239.6	253.17	246.3	223.81
253.7	196.79	261.6	171.84
270.1	148.61	279.25	127.45
279.26	0.	1000000.	0.

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Function
13
Reflood Steam Enthalpy
Ind. Var.: Time(sec)
Dep. Var.: h (Btu/lb)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	100.	15.1	100.
15.11	1300.98	15.2	1300.96
17.	1295.37	18.6	1289.08
20.	1284.1	20.01	1284.1
20.2	1283.62	21.8	1280.55
23.4	1278.54	25.	1277.21
26.6	1276.27	28.2	1275.6
29.8	1274.97	31.4	1274.42
33.	1273.87	34.6	1273.34
36.2	1272.79	37.8	1272.26
39.39	1271.71	39.4	1271.71
50.6	1267.88	61.7	1264.17
72.8	1260.51	83.9	1256.89
95.	1253.26	106.1	1249.66
117.2	1246.21	128.3	1242.74
139.4	1239.38	150.5	1236.31
161.6	1233.07	172.7	1229.88
183.8	1176.91	194.9	1176.91
206.	1176.91	206.1	1191.84
206.7	1170.86	207.9	1182.5
209.7	1173.58	212.2	1181.86
215.2	1173.62	218.9	1180.21
223.1	1175.34	228.	1178.73
233.5	1176.08	239.6	1177.21
246.3	1176.49	253.7	1177.78
261.6	1176.1	270.1	1176.76
279.3	1177.73	279.4	100.
1000000.	100.		

Function
14
LT Steam Mass Release
Ind. Var.: Time(sec)
Dep. Var.: Flow (lb/s)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	279.158	0.
279.258	172.389	279.307	173.744
279.358	182.88	279.408	185.04
279.457	184.823	279.508	184.839
279.557	184.827	279.608	184.821
279.658	184.814	279.707	184.807
279.758	184.8	279.807	184.794
279.858	184.787	279.908	184.78
279.957	184.773	280.008	184.766
280.057	184.76	280.108	184.753
280.158	184.746	280.207	184.739

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Function
14
LT Steam Mass Release
Ind. Var.: Time(sec)
Dep. Var.: Flow (lb/s)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
280.258	184.732	280.307	184.725
280.358	184.719	280.408	184.712
280.457	184.705	280.508	184.698
280.557	184.691	280.608	184.685
280.658	184.678	280.707	184.671
280.758	184.664	280.807	184.658
280.858	184.651	280.908	184.644
280.957	184.637	281.008	184.63
281.057	184.624	281.108	184.617
281.158	184.61	281.207	184.603
281.258	184.596	281.307	184.59
281.358	184.583	281.408	184.576
281.457	184.569	281.508	184.563
281.557	184.556	281.608	184.549
281.658	184.542	281.707	184.536
281.758	184.529	291.608	185.206
301.508	183.939	311.408	182.807
321.307	181.72	331.158	180.691
341.057	179.696	350.957	178.742
360.858	177.879	370.758	177.118
380.608	176.404	390.508	175.694
400.408	174.999	410.307	174.359
420.158	173.733	430.057	173.112
439.957	172.5	449.858	171.898
459.758	171.338	469.608	170.792
479.508	170.247	489.408	169.713
499.307	169.187	684.008	87.7619
882.008	80.4601	1080.01	75.4743
1278.01	71.6993	1476.01	68.3222
1673.01	65.2901	1871.01	62.5336
2138.01	60.8733	2534.01	56.9836
2928.01	53.9155	3324.01	51.3994
3720.01	49.3045	4116.01	47.538
4512.01	46.0185	4906.01	44.7398
5302.01	43.649	5698.01	42.6452
6094.01	41.7066	6488.01	40.9386
6884.01	40.185	7280.01	39.5272
7676.01	38.918	8072.01	38.3319
8466.01	37.8231	8862.01	37.3211
9258.01	36.8619	9654.01	36.4311
10000.	36.0585	10514.	35.9529
11028.	35.8883	11544.	35.8378
12056.	35.7659	12570.	35.4517
13086.	35.1159	13600.	34.7745
14114.	34.44	14628.	34.1472
15144.	33.8565	15656.	33.5678
16170.	33.2889	16686.	33.0348
17200.	32.7825	17714.	32.5309
18228.	32.2933	18744.	32.0751
19256.	31.8604	19770.	31.6455

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Function
14
LT Steam Mass Release
Ind. Var.: Time(sec)
Dep. Var.: Flow (lb/s)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
22860.	30.5469	27980.	28.9885
33140.	27.745	38280.	26.7211
43440.	25.8391	48560.	25.0746
53700.	24.4243	58860.	23.81
63980.	23.2707	69140.	22.7512
74280.	22.303	79440.	21.8687
84560.	21.4877	89700.	21.1135
94860.	21.8256	99980.	22.6231
100000.	22.6262	132000.	21.0411
164000.	19.8725	196000.	18.974
228000.	18.2939	260000.	17.6728
292000.	17.1362	360000.	16.2425
440000.	15.0342	520000.	13.767
600000.	12.7543	680000.	11.8801
760000.	11.0761	840000.	10.3523
920000.	9.69536	1000000.	9.11201

Function
15
LT Steam Enthalpy
Ind. Var.: Time(s)
Dep. Var.: h (Btu/lb)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	100.	279.158	100.
279.258	1186.87	279.307	1186.86
279.358	1186.96	279.408	1186.95
279.457	1186.8	279.508	1186.97
279.557	1186.97	279.608	1186.96
279.658	1186.97	279.707	1186.97
279.758	1186.97	279.807	1186.97
279.858	1186.97	279.908	1186.97
279.957	1186.97	280.008	1186.97
280.057	1186.97	280.108	1186.97
280.158	1186.97	280.207	1186.97
280.258	1186.97	280.307	1186.97
280.358	1186.97	280.408	1186.97
280.457	1186.97	280.508	1186.97
280.557	1186.97	280.608	1186.97
280.658	1186.97	280.707	1186.97
280.758	1186.97	280.807	1186.97
280.858	1186.97	280.908	1186.97
280.957	1186.97	281.008	1186.97
281.057	1186.97	281.108	1186.97
281.158	1186.97	281.207	1186.97
281.258	1186.97	281.307	1186.97
281.358	1186.97	281.408	1186.97

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Function
15
LT Steam Enthalpy
Ind. Var.: Time(s)
Dep. Var.: h (Btu/lb)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
281.457	1186.97	281.508	1186.97
281.557	1186.97	281.608	1186.97
281.658	1186.97	281.707	1186.97
281.758	1186.97	291.608	1186.97
301.508	1186.97	311.408	1186.96
321.307	1187.13	331.158	1187.12
341.057	1187.12	350.957	1187.12
360.858	1187.11	370.758	1187.1
380.608	1187.09	390.508	1187.26
400.408	1187.25	410.307	1187.25
420.158	1187.24	430.057	1187.23
439.957	1187.23	449.858	1187.22
459.758	1187.22	469.608	1187.21
479.508	1187.39	489.408	1187.39
499.307	1187.39	684.008	1187.89
882.008	1188.24	1080.01	1188.57
1278.01	1188.65	1476.01	1188.83
1673.01	1188.92	1871.01	1188.89
2138.01	1188.67	2534.01	1188.58
2928.01	1188.26	3324.01	1187.95
3720.01	1187.66	4116.01	1187.25
4512.01	1187.01	4906.01	1186.52
5302.01	1186.21	5698.01	1185.85
6094.01	1185.61	6488.01	1185.26
6884.01	1185.06	7280.01	1184.64
7676.01	1184.34	8072.01	1184.03
8466.01	1183.82	8862.01	1183.45
9258.01	1183.21	9654.01	1182.95
10000.	1182.65	10514.	1182.32
11028.	1181.98	11544.	1181.64
12056.	1181.31	12570.	1180.97
13086.	1180.62	13600.	1180.28
14114.	1180.11	14628.	1179.72
15144.	1179.33	15656.	1179.12
16170.	1178.91	16686.	1178.48
17200.	1178.24	17714.	1177.99
18228.	1177.74	18744.	1177.47
19256.	1177.19	19770.	1176.92
22860.	1175.45	27980.	1173.39
33140.	1171.52	38280.	1169.97
43440.	1168.45	48560.	1167.18
53700.	1166.21	58860.	1165.18
63980.	1164.3	69140.	1163.37
74280.	1162.61	79440.	1162.05
84560.	1161.45	89700.	1160.83
94860.	1160.44	99980.	1159.86
100000.	1159.86	132000.	1157.77
164000.	1156.61	196000.	1155.85
228000.	1155.31	260000.	1155.01
292000.	1154.84	360000.	1154.58

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Function
15
LT Steam Enthalpy
Ind. Var.: Time(s)
Dep. Var.: h (Btu/lb)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
440000.	1154.38	520000.	1154.3
600000.	1154.24	680000.	1154.18
760000.	1153.96	840000.	1154.1
920000.	1153.96	1000000.	1153.92

Function
16
Reflood Spillage Flow
Ind. Var.: Time(sec)
Dep. Var.: Flow (lb/sec)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	15.11	0.
15.2	59.16	15.5	94.9
16.	120.09	16.5	132.11
17.	178.44	17.5	219.24
18.	255.36	18.5	288.42
19.	319.32	20.	9509.5
21.	9281.4	22.	9054.2
23.	8842.9	24.	8645.8
25.	8461.2	26.	8287.8
27.	8124.3	28.	7969.9
29.	7823.5	30.	7684.6
31.	7552.3	32.	7426.3
33.	7305.9	34.	7190.8
35.	7080.5	36.	6974.8
37.	6873.2	38.	6775.5
39.	6681.4	40.	142.19
45.	147.57	50.	156.15
55.	164.44	60.	172.52
65.	180.44	70.	188.24
80.	203.55	90.	218.51
100.	233.28	120.	262.89
140.	292.59	160.	322.91
180.	352.3	200.	427.01
206.	440.01	226.	715.26
246.	981.52	266.	1077.3
279.25	1067.2	279.26	0.
1000000.	0.		

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Function
17
Reflood Spillage Enthalpy
Ind. Var.: Time (sec)
Dep. Var.: h (Btu/lb)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	100.	15.01	100.
15.11	259.94	15.2	259.94
15.5	259.94	16.	259.94
16.5	259.94	17.	259.94
17.5	259.94	18.	259.94
18.5	259.94	19.	259.94
20.	94.25	21.	94.41
22.	94.58	23.	94.74
24.	94.89	25.	95.04
26.	95.18	27.	95.31
28.	95.44	29.	95.57
30.	95.7	31.	95.82
32.	95.94	33.	96.06
34.	96.18	35.	96.29
36.	96.41	37.	96.52
38.	96.63	39.	96.74
40.	88.	45.	88.
50.	88.	55.	88.
60.	88.	65.	88.
70.	88.	80.	88.
90.	88.	100.	88.
120.	88.	140.	88.
160.	88.	180.	114.46
200.	205.39	206.	227.94
226.	252.36	246.	259.81
266.	259.81	286.	259.81
286.1	100.	1000000.	100.

Function
18
SI Pump Spillage
Ind. Var.: Time (sec)
Dep. Var.: flow (lb/sec)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	15.09	0.
15.1	59.28	1881.39	59.28
1881.4	0.	1000000.	0.

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Function
19
SIT Spillage
Ind. Var.: time (sec0
Dep. Var.: flow (lb/sec)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	2817.	30.	2817.
30.01	0.	1000000.	0.

Function
20
Nitrogen Release
Ind. Var.: time (sec)
Dep. Var.: flow (lb/sec)

Ind. Var.	Dep. Var.	Ind. Var.	Dep. Var.
0.	0.	91.75	0.
91.755	253.96	92.25	228.82
92.75	204.66	93.25	181.61
93.75	159.5	94.25	138.21
94.75	117.62	95.25	97.61
95.75	78.01	96.25	58.67
96.75	39.39	97.25	19.67
97.75	0.	1000000.	0.

Control Variables

CV #	Description	Type	Initial Value	Coeff. G	Coeff. a0	Min	Max	Upd. Int. Mult.
1	Hx + CFC Ht L	sum	0.	1.	0.	-1e+03	1e+032	0.
2	Total Heat Re	integ	0.	1.	0.	-1e+03	1e+032	0.

Control Variable
#
Hx + CFC Ht Load
sum
Y=G*(a0+a1X1+a2X2+...+anXn)

#	Gothic_s Name	Variable location	Coef. a
1	qhxa(1)	cX1H	1.
2	htq	cH1C	1.

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Control Variable # Total Heat Removal integ Y=G*integ((a0+a1X1)dt)			
#	Gothic_s Name	Variable location	Coef. a
1	cvval	cv1	1.

Run Control Parameters (Seconds)									
Time Int	DT Min	DT Max	DT Ratio	End Time	Print Int	Graph Int	Max CPU	Dump Int	Phs Chng Time Scale
1	0.001	0.01	1.	0.5	1e+007	0.1	2500.	0.	DEFAULT
2	0.001	0.1	1.	10.	1e+007	0.5	1000.	0.	DEFAULT
3	0.01	0.1	1.	20.	1e+007	0.25	2000.	0.	DEFAULT
4	0.01	0.25	1.	270.	1e+007	2.	2000.	0.	DEFAULT
5	0.01	0.25	1.	330.	1e+007	0.5	3000.	0.	DEFAULT
6	0.01	0.5	1.	1520.	1e+007	30.	2000.	0.	DEFAULT
7	0.01	0.5	1.	1600.	1e+007	10.	3000.	0.	DEFAULT
8	0.01	1.	1.	10000.	1e+007	150.	25000.	0.	DEFAULT
9	0.01	1.5	1.	87000.	1e+007	500.	90000.	0.	DEFAULT
10	0.01	5.	1.	1e+006	1e+007	1800.	90000.	0.	DEFAULT

Solution Options						
Time Dom	Solution Method	Imp Conv Limit	Imp Iter Limit	Pres Sol Method	Pres Conv Limit	Pres Iter Limit
1	SEMI-IMP	0.	1	DIRECT	0.	1
2	SEMI-IMP	0.	1	DIRECT	0.	1
3	SEMI-IMP	0.	1	DIRECT	0.	1
4	SEMI-IMP	0.	1	DIRECT	0.	1
5	SEMI-IMP	0.	1	DIRECT	0.	1
6	SEMI-IMP	0.	1	DIRECT	0.	1
7	SEMI-IMP	0.	1	DIRECT	0.	1
8	SEMI-IMP	0.	1	DIRECT	0.	1
9	SEMI-IMP	0.	1	DIRECT	0.	1
10	SEMI-IMP	0.	1	DIRECT	0.	1

Run Options	
Parameter	Value
Restart Time (sec)	0
Restart Time Step #	0
Restart Time Control	NEW
Revaporization Fraction	1e-006
Heterogenous Nucleation	INCLUDE

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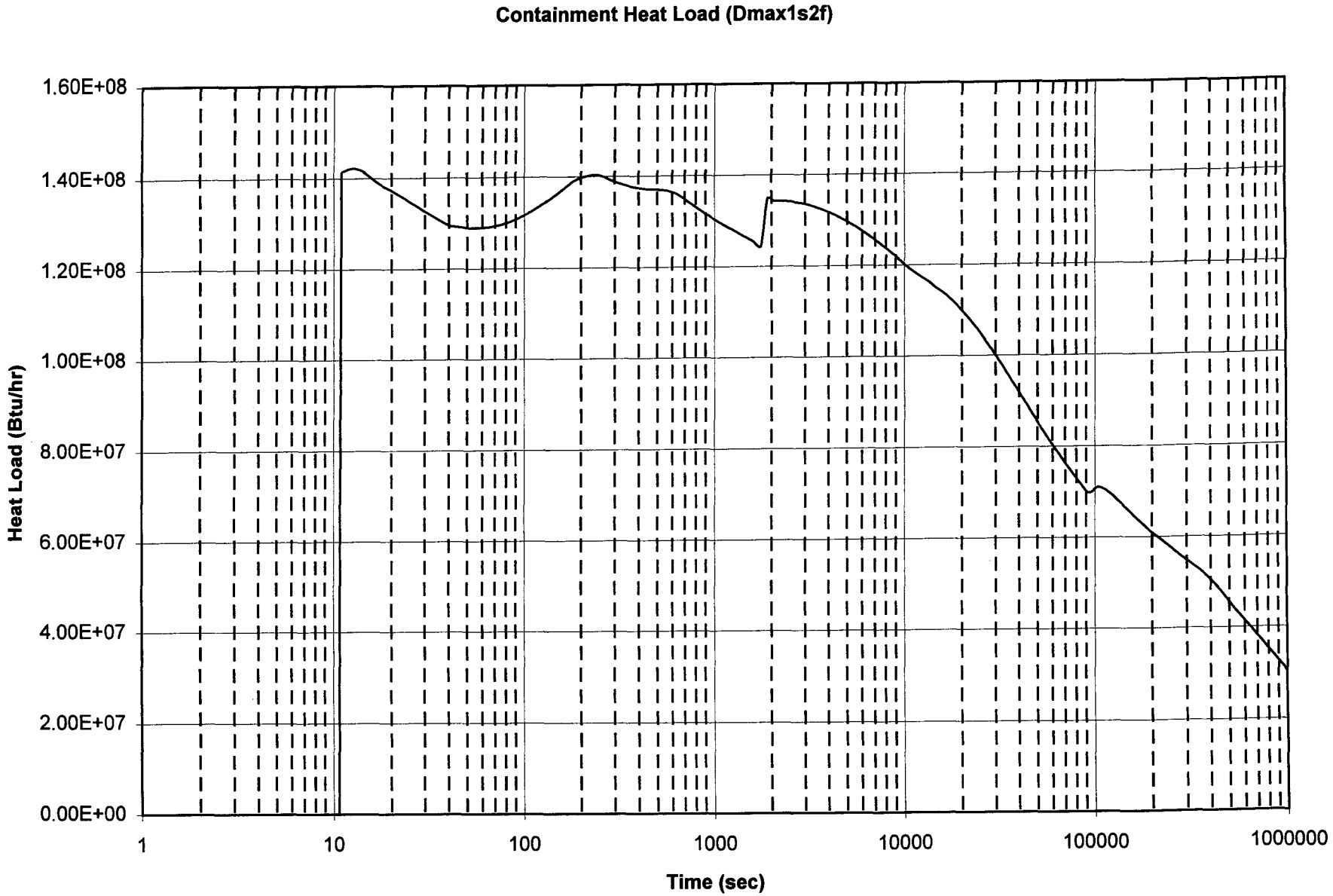
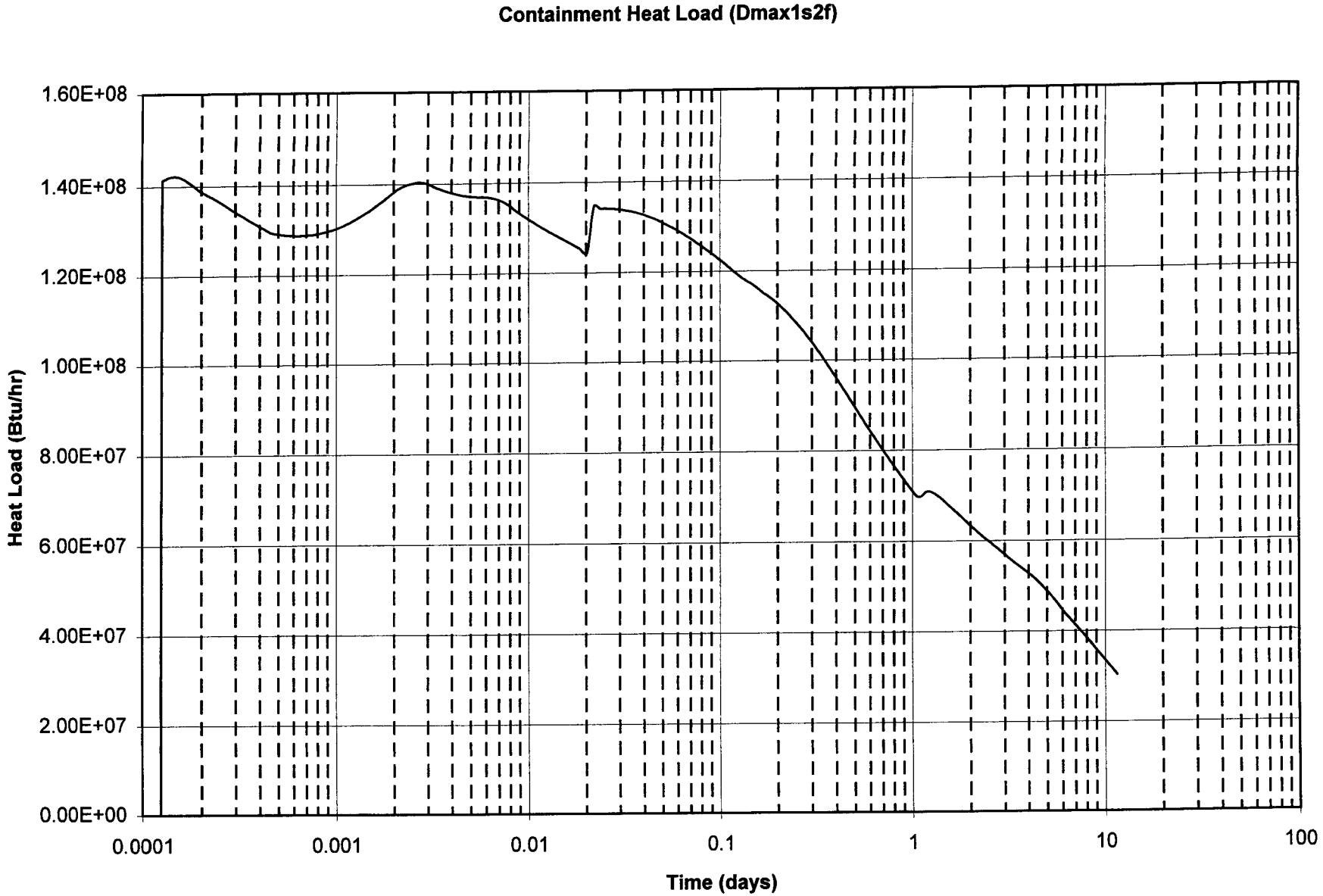
Run Options

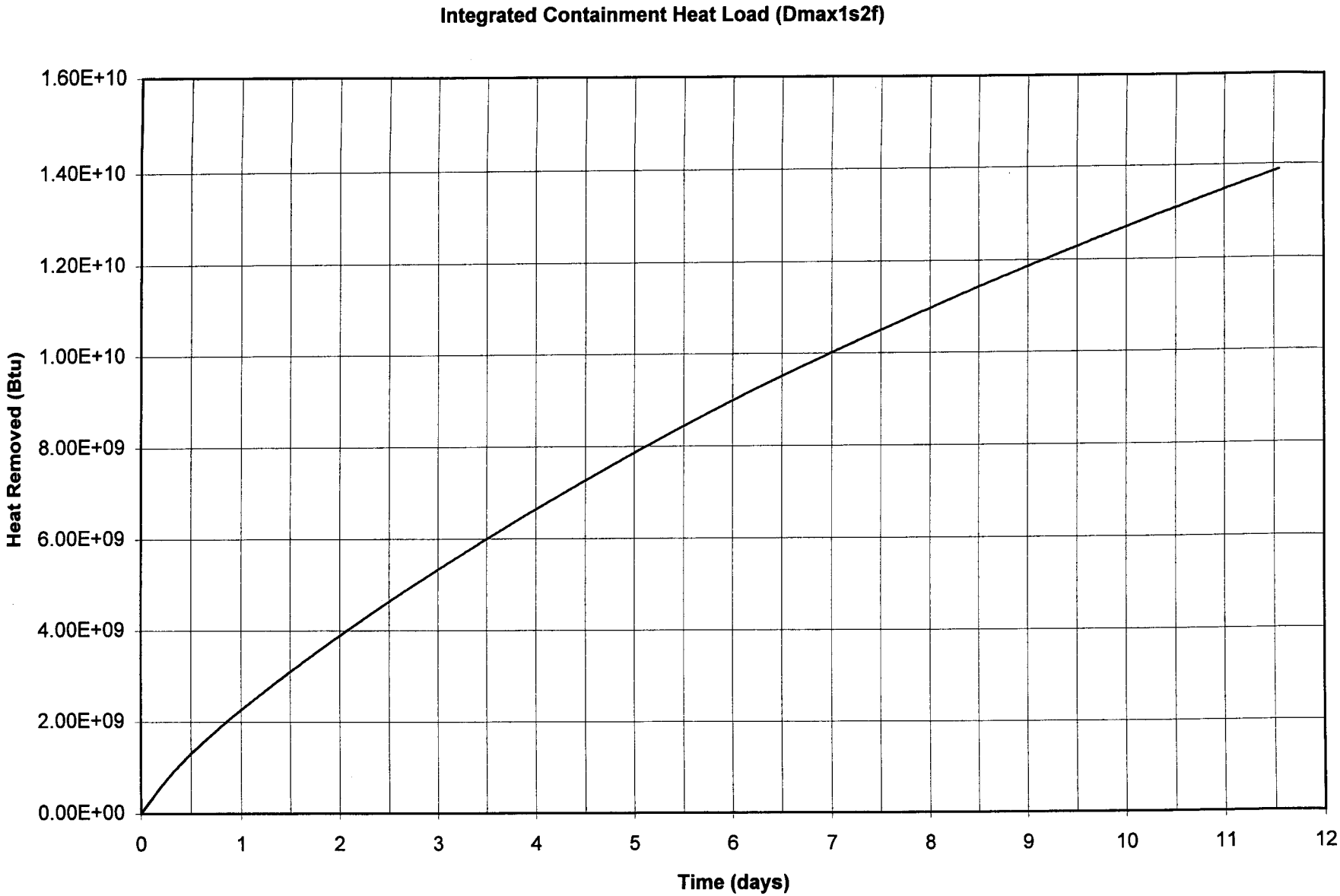
Parameter	Value
Minimum HT Coeff.	0
Reference Pressure	IGNORE
Forced Ent. Drop Diam.	0.00833
Vapor Phase Head Correction	INCLUDE
Kinetic Energy	IGNORE
Vapor Phase	INCLUDE
Liquid Phase	INCLUDE
Drop Phase	INCLUDE
Force Equilibrium	IGNORE
Drop-Liq. Conversion	INCLUDE
QA Logging	OFF
Debug Output Level	0
Restart Dump on CPU Interval (sec)	3600.0

Graphs

Graph #	Title	Mon	Curve Number 1	2	3	4	5
1	Figure 1: Conta		PR1				
2	Figure 2: Cont.		TV1	TL2			
3	SDCHX Parameter		T11H	t11H	T21H	t21H	
4	Figure 3: Condu		TA1	TA4s	TA6	TA16	
5	Figure 4:TC HTC		HA1	HA4s	HA6	HA16	
6	Pressure Fracti		1R1	SR1			
7	Figure 5: Break		FV2	FV8	FV9		
8	Spray & Sump Fl		FD3	FD5			
9	Liquid Levels		LL1	LL2			
10	Figure 6: SDCHX		xq1H	CQ1C			
11	Total heat rate		cv1				
12	Total UHSS Heat		cv1	cv2			


Containment Heat Load (Dmax1s2f)
Heat Load (Btu/hr)
1.60E+08
1.40E+08
1.20E+08
1.00E+08
8.00E+07
6.00E+07
4.00E+07
2.00E+07
0.00E+00
1
10
100
1000
10000
100000
1000000
Time (sec)


Containment Heat Load (Dmax1s2f)
Heat Load (Btu/hr)
1.60E+08
1.40E+08
1.20E+08
1.00E+08
8.00E+07
6.00E+07
4.00E+07
2.00E+07
0.00E+00
0.0001
0.001
0.01
0.1
1
10
100
Time (days)


Integrated Containment Heat Load (Dmax1s2f)
Heat Removed (Btu)
1.60E+10
1.40E+10
1.20E+10
1.00E+10
8.00E+09
6.00E+09
4.00E+09
2.00E+09
0.00E+00
0
1
2
3
4
5
6
7
8
9
10
11
12
Time (days)