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BROWNS FERRY NUCLEAR PLANT UNIT 2 PROBABILISTIC SAFETY ASSESSMENT WITH UNIT 3 OPERATING

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1. INTRODUCTION

1.1 OBJECTIVE AND SCOPE

This report presents the results of an update to the Browns Ferry Unit 2 Probabilistic Safety Assessment (PSA) to reflect the shared mission of some components, systems, and structures at the plant. For this analysis, Unit 1 is assumed to remain in extended layup with no fuel in its core. Also, Unit 3 is modeled in this analysis as having returned to service; specifically, Unit 3 is assumed to be either operating at power or in an outage. These assumptions reflect the current operational configuration of the Browns Ferry Nuclear Plant (BFN).

This update builds on previous models that considered other plant configurations. The Individual Plant Evaluation (IPE) (Reference 1) examined the three unit BFN site under the assumption that only Unit 2 was initially at power, with Units 1 and 3 in layup. Consequently, Units 1 and 3 equipment permitted by plant design and plant status to support Unit 2 would have no other functional requirements. The Multi-Unit PRA (Reference 2) examined initiating events at Unit 2 with all three units initially at power. The current model, with Unit 2 initially operating and Unit 3 in service, reflects a condition that is bounded by the two site configurations that were previously analyzed. That is to say, the individual success criteria for plant systems in the current model are both no more stringent than the corresponding criteria appropriate for the Multi-Unit PRA and at least as restrictive as the corresponding criteria in the IPE. In a like manner, the availability of specific shared equipment to support Unit 2 falls between the two extremes represented by the Multi-Unit PRA and the IPE.

This report documents the results of the first revision to an earlier model (Reference 3). As such, the model discussed is this report contains a number of minor refinements made to the Revision 0 model. None of the top 10 core damage scenarios differ from those reported in Reference 3.

This quantification considers the response of Unit 2 to initiating events while it is operating at full power, considering that Unit 3 may also be at full power and remain at power, may have also been affected by the same initiating event, or has been previously shut down. The model considers the core damage frequency (CDF) due to internal events as well as internal flooding. The systems and components available for use in bringing Unit 2 to a safe shutdown condition considers requirements of common systems to support Unit 3 under the above three circumstances as well as potential interactions and dependencies.

In addition to reflecting the latest operational configuration, the plant model has been revised to reflect selected functional capabilities of equipment and systems that were not taken credit for in previous quantifications. Discussion of changes to the model is contained in Section 4.

This report summarizes only those changes to the plant model made to reflect the specific plant configuration described above. Details of many of the underlying models can be found in the previous PRA reports (References 1, 2, and 4).

1.1.1 SUMMARY OF RESULTS

The overall results indicate that the mean CDF for Unit 2 for the initiating events considered in this analysis is 5.39E-06 per year. A single parameter, such as the mean value, however, does not tell the full story about the CDF. A probabilistic distribution was determined for the CDF. That distribution is given in Figure 1-1. Besides the mean value, other characteristics of this distribution are the 5th percentile (9.02E-07 per year), the 50th percentile (2.64E-06 per year), and the 95th percentile (1.48E-05 per year). These percentiles permit the following interpretation of the CDF:

> We are as confident that "the" CDF at Unit 2 is above 2.64E-06 per year as we are that it is below 2.64E-06. Furthermore, the 5th and 95th percentiles allow us to claim that we are 90% confident that "the" CDF is between 9.02E-07 and 1.48E-05 per year.

The overall CDF is quite small. Based on the mean CDF, the analysis suggests that the current procedures, practices, and equipment performance at Unit 2 would result in one core damage event, on average, approximately every 185,000 years. The interval between expected core damage events is quite large compared to the plant lifetime, indicative of a well operated plant.

Information used to calculate the CDF distribution is summarized in Appendix A.

1.1.2 DISCUSSION OF THE TOP 10 SEQUENCES

A summary description of the top 100 sequences is presented in Appendix B.

The sequences that individually are the 10 most frequent core damage sequences are described in this section. Note that the frequencies of the individual sequences are quite small, with none larger than 1.01E-07 per year. The highest frequency sequence is anticipated to occur on the order of once every 10,000,000 years. Perspective on these small frequencies is necessary when interpreting the sequences. When one sees, for example in the first sequence, a reference to the failure of the operator to control low pressure injection during an anticipated transient with scram (ATWS) given a stuck-open relief valve, it is easy to miss the fact that the model also indicates that under those circumstances, the operator will be successful in performing the necessary actions under these stressful and unusual conditions 11 out of 12 times.

The first sequence is initiated by a turbine trip; failure of the control rods to insert into the core; successful operation of the standby liquid control and initial level control by the high pressure injection systems; failure of one relief valve to reseat following initially lifting to limit pressure; and failure to control the injection of low pressure systems once pressure has decayed. Core damage is assumed to occur due to the large inflow of low pressure water diluting or displacing the borated vessel inventory resulting in an unanalyzed condition that may lead to recriticality. The mean frequency of this sequence is 1.01E-07 per year.

The second and third sequences are related. Both are initiated by a turbine trip followed by failure of the control rods to insert into the core and failure of boron to inject to control reactivity. In sequence two, boron injection failure is due to operator failure to initiate the standby liquid control system. Sequence three is due to the standby liquid control system being unavailable due to hardware failures, or a combination of hardware failures and test or maintenance. The mean frequencies of the second and third sequences are 7.52E-08 and 7.25E-08 per year, respectively.

Sequence four is a blackout of Units 1 and 2. The sequence initiator is loss of offsite power (both the 500-kV and 161-kV grids) followed by failure of diesel generators A, B, C, and D to supply power. The high pressure coolant injection and the reactor core isolation cooling systems are initially available to maintain vessel level control, but core damage eventually occurs since power is not recovered and no means of removing decay heat is established. The mean frequency of this sequence is 6.81E-08 per year.

Sequence five is a transient with the loss of the ability to maintain the core covered. This sequence is initiated by the loss of the raw cooling water system. The high pressure coolant injection and reactor core isolation cooling systems are unavailable to inject water into the vessel. The initiator prevents the control rod drive hydraulic system from being operable and the operator fails to depressurize the vessel in a timely manner to allow low pressure injection systems to maintain core coverage. The mean frequency of this sequence is 5.98E-08 per year.

The sixth sequence is quite similar to the second sequence: a transient, this time the closure of all main steam isolation valves, followed by failure of the control rods to insert and failure to initiate the standby liquid control system. The mean frequency of this sequence is 5.47E-08 per year.

The seventh sequence is similar to the fifth sequence. In the seventh sequence, the sequence is initiated by the closure of all main steam isolation valves, successful scram, but failure of the high pressure injection system, the reactor core isolation cooling system, and the control rod drive hydraulic system, and failure to depressurize the vessel. The initiator "MSIV Closure" occurs more frequently than "Loss of Raw Cooling Water;" the primary difference being how the control rod drive hydraulic system fails. In the fifth sequence, it is failed due to loss of support as a result of the initiating event, and in the seventh sequence, it is unavailable due to hardware failure or maintenance activities (both pumps 2A and 1B are required for success). The mean frequency of this sequence is 4.83E-08 per year.

The eighth sequence is also similar to the fifth sequence. The initiator, loss of offsite power, like the loss of raw cooling water, defeats the operation of the control rod drive hydraulic system. Core damage occurs following failure of the high pressure coolant injection system and the reactor core isolation cooling system, and failure to depressurize the vessel. The mean frequency of this sequence is 4.66E-08 per year.

The ninth sequence is actually the sum of several individual sequences that were individually analyzed. Each of these sequences have the characteristic that a system designed for low

pressure is inadvertently subjected to full reactor pressure resulting in an unisolated loss of coolant accident (LOCA). Since the break discharges into the reactor building, the subsequent degraded environment (high temperature and high humidity being the initial characteristics) is assumed to result in the failure of equipment that potentially could mitigate the accident. The mean frequency of this family of sequences is 4.63E-08 per year.

The tenth sequence leads to core damage due to the loss of ability to remove decay heat. The sequence is initiated by the failure of the raw cooling water system, followed by successful initial operation of the high pressure coolant injection and the reactor core isolation cooling systems, failure of a relief valve to reseat after initially lifting to limit pressure in the primary system, and failure to establish suppression pool cooling. The specific reason for failure to establish suppression pool cooling is failure of the operator team to perform the required actions. Core damage is assumed to be the final result; alternate means of removing decay heat are conservatively not credited since the root cause of the decay heat removal failure is due to operator failure, which may involve failure of diagnosis, rather than mechanical failures. The mean frequency of this sequence is 4.50E-08 per year.

A summary description of the top 100 sequences is presented in Appendix B.

1.1.3 FUNCTIONAL FAILURE GROUP CONTRIBUTIONS TO CDF

Table 1-1 presents the results of recasting the core damage frequencies into seven functional categories. Consideration of the functional categories provides some insights into the nature of the results. It should be noted that the functional categories are not mutually exclusive; individual sequences can be assigned to more than one functional category. As can be seen, nearly 41% of the CDF is due to sequences involving failure to control reactivity. Eighteen percent of the CDF is from sequences that can be characterized by the loss of the ability to remove decay heat. Transients with the reactor vessel at high pressure represent 12.9% of the total core damage frequency. The transients with the reactor at high pressure can be characterized typically as an initiating event involving the loss of feedwater, the unavailability of both the high pressure coolant injection and the reactor core isolation cooling systems, and the failure to manually depressurize the vessel to allow low pressure systems to maintain level control. Transients followed by a loss of vital DC power contribute 4.8% of the total core damage frequency. This group is defined as any transient followed by the loss of battery board 1, 2, or 3. For Unit 2, battery boards 2 and 3 are of particular interest. Many sequences assigned to this group involve a failure of both battery boards 2 and 3, thus disabling high pressure coolant injection (HPCI) and reactor core isolation cooling (RCIC). Sequences involving failure of battery boards 2 and 3 constitute 2.8% (1.49E-07 per year) of the total core damage frequency. A typical sequence in this group is a transient that involves the loss of normal heat sink, such as closure of all main steam isolation valves, followed by failure of DC power resulting in the inoperability of HPCI, RCIC, and the ability to remove decay heat.

Two station blackout accident sequence groups are defined. The first such functional category (7.4% of the total CDF) is due to the unavailability of AC power in the Unit 1/Unit 2 portion of the plant. Blackout in this case is defined to be the loss of offsite power followed by

failure of diesel generators A, B, C, and D. A smaller contribution (4.2% of the total CDF) is due to total station blackout (failure of offsite power as well as all eight diesel generators at the site).

A small contribution to CDF (4.0%) can be attributed to sequences involving degraded states of the emergency equipment cooling water system.

1.1.4 INITIATING EVENT GROUP CONTRIBUTION TO CDF

Table 1-2 summarizes the results at the initiating event group level. The performance of a PSA begins with the identification of a comprehensive set of scenario initiators, often called initiating events or initiators. Table 1-2 also summarizes the CDF contribution due to initiating event categories as well as the individual initiators.

1.1.5 IMPORTANT OPERATOR ACTIONS

Table 1-3 identifies the 10 most "important" operator actions that were included in the model for the response of the plant and the operators to the entire set of initiating events. The importance measures were derived from the split fraction importance measures (the "fraction importance") reported in the first numerical column in Appendix C. Split fraction importance is defined as the fraction of all core damage scenarios that include failure of the specific split fraction. This fraction can be determined by dividing the sum of the frequencies of scenarios containing the failed split fraction by the sum of the frequencies of all core damage frequencies.

Note that 2 of the 10 entries in Table 1-3 required adjusting. These split fractions, RVD22 and U12, contain both hardware and operator action elements. To eliminate the hardware portion of the fractional importance for RVD22 (0.134 from Appendix C), it was multiplied by the fraction of the split fraction value that is due to operator error (0.86). In a similar manner, the fractional importance of U12 from Appendix C (0.016) was multiplied by 0.58. It should be noted that the split fraction CRD4, which contains both hardware and operator elements, has a fractional importance from Appendix C of 0.065. However, the portion due to operator error is quite small (0.025). Consequently, it does not appear in the list of the top 10 actions.

1.1.6 IMPORTANT SYSTEMS

Table 1-4 identifies the importance of selected plant systems. The top events that represent hardware and that comprise the mechanical support, signal, and frontline event trees were assigned to appropriate system groups. Top events that represented operator actions were not assigned to a system group. Two electrical groups were defined: one for the diesel generators and one for the battery boards 1, 2, and 3. These groups were used to determine importance measures.

The importance measures were determined from the information summarized in Appendix C by summing the importance of all split fractions (other than the one corresponding "guaranteed failure") associated with a given system.

1.2 PROCESS FOLLOWED TO DEVELOP CURRENT MODEL

The model developed in this analysis used the Rev. 1 Interim Order #2 (I.O. #2) version of the Browns Ferry Unit 2 PRA (Reference 4) as a starting point. Information developed as part of the Multi-Unit PRA (Reference 2) was utilized in the model development. The plant configuration being analyzed (Unit 1 in layup, Unit 2 initially at power, and Unit 3 returned to service) was scrutinized to determine which constituent models, those associated with the Rev. 1 I.O. #2 PRA or those associated with the Multi-Unit PRA, were more appropriate starting points. The process of scrutinizing the plant configuration is summarized in Section 3.

Advantage was taken of the opportunity to make specific model elements more realistic and to make corrections. These modeling changes are summarized in Section 4. Where appropriate, updates to the system notebooks were performed.

1.3 ϕ-M MATRIX

A convenient way to summarize the results of a PSA is to construct a table that shows how each of the initiating events map to the plant damage states considered in the analysis. If the initiating events are thought of as a vector ("ϕ"), then the plant model, event trees, and fault trees could be represented by a transformation matrix ("M") that relates the initiators to the plant damage states. ϕ-M would then display the relationship of the initiators to the plant damage states. The ϕ-M matrix for Unit 2 is presented in Appendix D of this report.

Table 1-1. Contributions of Functional Failure Groups to CDF		
Accident Sequence Group	**Mean CDF* (per Year)**	**Percentage of Total***
ATWS	2.19E-06	40.9
Loss of Residual Heat Removal	9.59E-07	17.9
Transient with Reactor Vessel at High Pressure	6.92E-07	12.9
Blackout of Units 1 and 2	3.94E-07	7.4
Transient followed by Loss of Vital DC Power	2.57E-07	4.8
Station Blackout	2.26E-07	4.2
Degraded Emergency Equipment Cooling Water	2.14E-08	0.4

*The mean CDF is determined by examining the dominant sequence file. The sequences in the dominant sequence file represent in excess of 99% of the total CDF and form a convenient database for risk management applications. The accident sequence groups are defined by specifying success or failure combinations of top events or split fractions. For example, the "ATWS" accident sequence group is defined as all sequences with the Top Event "RPS" failed. Since the dominate sequence file represents less than 100% of the total CDF, the "percentage of total" for each accident sequence group is determined by dividing the mean CDF for that group by the total CDF represented by the dominant sequence file. In the current model, the total CDF represented by the dominant sequence file is 5.36E-06 (per year). For the ATWS accident sequence group, for example, the "percentage of total" is calculated as:

2.19E-06 ÷ 5.36E-06 = 40.9%

Table 1-2 (Page 1 of 2). Contribution to CDF by Initiating Event Group	
Initiating Event Group	**Mean CDF (per Year)**
Transients with Reactor not Isolated	**1.58E-06**
Loss of Feedwater	2.88E-07
Turbine Trip	6.99E-07
Inadvertent Scram	8.47E-08
Feedwater Rampup	1.07E-07
Events Requiring the Reactor to Scram	1.15E-07
Partial Loss of Feedwater	1.40E-07
Loss of All Condensate	5.23E-08
Partial Loss of All Condensate	9.48E-08
Loss of Offsite Power	**1.35E-06**
Transients with Reactor Isolated	**1.04E-06**
Closure of All Main Steam Isolation Valves	4.75E-07
Loss of Condenser Vacuum	2.35E-07
Turbine Trip without Bypass	2.31E-07
Loss of the 500-kV Grid to Unit 2	3.55E-08
Loss of the 500-kV Grid to the Station	3.48E-08
Pressure Regulator Failure - Fails Open	3.07E-08
Break Outside of Containment	1.42E-09
Support System Failure	**7.03E-07**
Loss of Raw Cooling Water	5.38E-07
Loss of Plant Control Air	2.30E-08
Loss of I&C Bus 2A	3.08E-09
Loss of I&C Bus 2B	3.09E-09
Loss of Unit Preferred Power	3.75E-08
Loss of Reactor Building Closed Cooling Water System	9.04E-08
Failure of Lower Instrument Tap IA	1.91E-09
Failure of Lower Instrument Tap IIA	1.91E-09
Failure of Lower Instrument Tap IB	1.99E-09
Failure of Lower Instrument Tap IIB	1.91E-09
Failure of Upper Instrument Tap I	2.23E-10
Failure of Upper Instrument Tap II	2.23E-10

Table 1-2 (Page 2 of 2). Contribution to CDF by Initiating Event Group	
Initiating Event Group	**Mean CDF (per Year)**
Loss of Coolant Accidents	**4.41E-07**
Small LOCA	7.20E-08
Recirculation Discharge Line Break	1.12E-07
Recirculation Suction Line Break	2.66E-08
Core Spray Line Break	7.77E-08
Other Large LOCA	3.16E-08
Medium LOCA	1.06E-07
Very Small LOCA	5.80E-09
Excessive LOCA	9.10E-09
Stuck-Open Relief Valves	**1.34E-07**
Inadvertent Opening of One Relief Valve	6.88E-08
Inadvertent Opening of Two Relief Valves	8.77E-09
Inadvertent Opening of Three or More Relief Valves	5.65E-08
Internal Floods	**9.29E-08**
Small Flood in the Turbine Building	1.93E-08
Large Flood in the Turbine Building	2.22E-08
Flood in the Pumping Station	1.15E-08
Flood Scenario 1 in the Reactor Building	4.35E-09
Flood Scenario 2 in the Reactor Building	3.86E-10
Flood Scenario 3C in the Reactor Building	6.90E-10
Flood Scenario 3S in the Reactor Building	3.45E-08
Interfacing System LOCAs	**4.63E-08**
Total CDF	**5.39E-06**

Table 1-3. Ten Most Important Operator Actions Failures Contributing to Core Damage		
Operator Action	**PSA Importance**	**Surrogate Split Fraction**
Manual Depressurization of the Reactor Vessel using the Safety Relief Valves	0.115*	RVD22
Manual Control of Low Pressure Injection during ATWS	0.114	OLA1
Manual Alignment of Residual Heat Removal to Suppression Pool Cooling	0.109	OSP1
Manual Start of Standby Liquid Control Given ATWS and the Reactor Vessel Isolated	0.056	OSL1
Manual Start of Standby Liquid Control Given ATWS and the Reactor Vessel Not Isolated	0.037	OSL2
Prevention of Automatic Depressurization System during ATWS	0.012	OAD1
Alignment of Unit 1 Residual Heat Removal to Unit 2 via Crosstie	0.009**	U12
Reactor Vessel Level Control Using Residual Heat Removal/Core Spray	0.008	OLP1
Manual Start of Residual Heat Removal/Core Spray	0.008	ORP2
Level Control during ATWS	0.005	OAL1

*The fractional importance of 0.134 from Appendix C has been multiplied by the fraction (0.86) of the split fraction value that is due to operator action.
**The fractional importance of 0.016 from Appendix C has been multiplied by the fraction (0.58) of the split fraction value that is due to operator action.

Table 1-4. PSA Importance of Individual BFN Systems	
System	**PSA Importance***
Reactor Protection System	0.41
Diesel Generators	0.21
High Pressure Coolant Injection System	0.18
Residual Heat Removal System	0.18
Reactor Core Isolation Cooling System	0.16
Residual Heat Removal Service Water System	0.15
Control Rod Drive System	0.09
Standby Liquid Control System	0.07
Shared Actuation Instrumentation	0.05
250V DC Battery Boards	0.05
Main Steam System Including Turbine Trip	0.04
Core Spray	0.02
RBCCW	0.01
Emergency Equipment Cooling Water System	< 0.01
Condensate and Feedwater System	< 0.01
Plant Air	< 0.01
*The fraction of CDF with sequences in which the failures occur in the indicated system.	

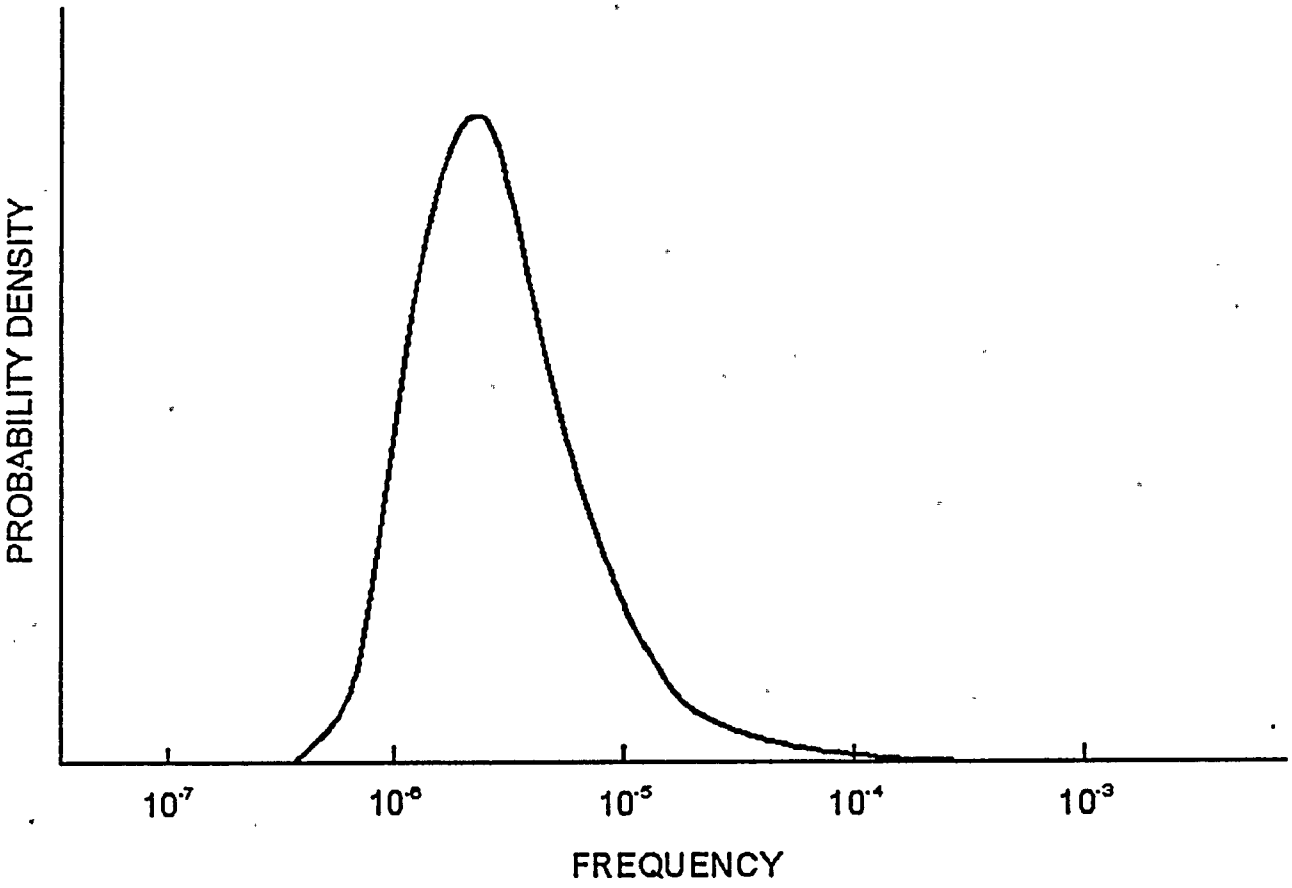

Figure 1-1. Probability Distribution of Browns Ferry Unit 2 Core Damage Frequency

2. JUSTIFICATION FOR EXCLUSION OF CONTROL ROOM HVAC FROM PSA MODEL

2.1 BACKGROUND

The reactor building and control bay ventilation and cooling systems were not explicitly included in the IPE or Rev. 1 I.O. #2 PRA models (References 1, 2, and 4, respectively). The IPE did include a quantitative evaluation for the upper bound of the impact on the CDF of Unit 2 following failure of the shutdown board room heating, ventilating, and air conditioning (HVAC) or control bay ventilation and cooling systems. Failure of the shutdown board room cooling was shown not to lead to failure of components in the affected rooms. Failure of control bay cooling was shown to have a small impact on CDF. According to available information, the impact of the reactor building HVAC does not lead to system failure and thus was determined not to require modeling.

However, for the Multi-Unit PRA, the control bay ventilation was explicitly added to the PRA model in order to quantitatively measure the risk significance of the control bay HVAC system. The Multi-Unit PRA considered the control bay HVAC as both an explicit support system and a potential initiator category.

2.2 DESCRIPTION OF MULTI-UNIT PRA HVAC ANALYSIS

An HVAC event tree was developed that used available analyses to address the loss of room cooling to various portions of the control bay. A bounding analysis was conducted that indicated that the unrecovered loss of room cooling to the main (Unit 1/Unit 2) control room is very unlikely. Thus, the loss of cooling to the main control room was not explicitly represented in the event tree. Loss of cooling at the Elevation 593' level was determined to cause heat up to temperatures above the equipment qualifications temperatures for equipment in both reactor protection system (RPS) motor-generator set rooms as well as the unit preferred power (UPS) motor-generator set room. Loss of cooling on the Elevation 593' level was explicitly assumed to result in failure of the equipment in the RPS and UPS motor-generator set rooms. Cooling of the relay room (adjacent to the main control room), the Unit 2 auxiliary instrument room, and the battery board room were all represented by individual top events in the event tree.

Operator recovery actions (such as opening doors locally) were also represented by top events for the relay room and the Elevation 593' rooms.

In addition, electric power at vent boards A and B and the availability of Unit 1/Unit 2 chilled water are represented by top events in the HVAC event tree.

The Multi-Unit PRA modeled the impact of the loss of the HVAC system in terms of both an initiating event and a support system failure. The HVAC analyses were assumed to be applicable to both single and multi-unit operations; i.e., the same support requirements were assumed for the HVAC system whether or not the transient was multi-unit or single-unit in

nature. The initiating events represented by their frequency of occurrence and contribution to core damage are provided in Table 2-1.

In terms of support systems, only the independent failure of chilled water provided a measurable contribution to the plant CDF. The loss of chilled water top event has an importance calculated as 3.447E-04; i.e., the fraction of sequences containing the independent failure top event. Consequently, the total contribution of the chilled water top event to the plant CDF is less than 10^{-8} per year.

2.3 CONCLUSIONS

The impact of the loss of HVAC to the control bay was conservatively modeled in the Multi-Unit PRA and the contributions to core damage for each of the initiating events analyzed were determined to be less than 3.2E-09 as compared to a total mean CDF from all initiators of 2.78E-05. The only measurable contribution due to the loss of the HVAC support system resulted in a contribution of less than 10^{-8} to the mean CDF. Consequently, excluding the HVAC event tree from the Unit 2 model is determined to have an insignificant impact on the CDF evaluation and therefore will not be represented explicitly in the event tree model.

Table 2-1. Impact of the Loss of HVAC Systems that Provide Cooling to Portions of the Control Bay		
Description	**Frequency (per Year)**	**Core Damage Contribution**
1. Loss of 593 ft level HVAC	8.91E-07	1.35E-12
2. Loss of Auxiliary Instrument Room HVAC	2.39E-03	2.93E-09
3. Loss of Battery Room HVAC	1.06E-03	2.50E-10
4. Loss of Chilled Water	9.13E-07	1.54E-12
5. Loss of Relay Room HVAC	7.01E-05	*
	Total	3.18E-09
*Less than 1.0E-12.		

3. PLANT CONFIGURATION

3.1 DESCRIPTION OF PLANT CONFIGURATION

The plant configuration under consideration is one in which Unit 2 is initially at power, Unit 3 returned to service (i.e., it is either initially operating or shut down), and Unit 1 remaining in extended layup. An assessment of the potential for multi-unit interactions at BFN was performed in the Multi-Unit PRA to determine the impact on shared systems or structures associated with Unit 2 by the return to service of Units 1 and 3. Guidelines or criteria were developed and used in that study to identify systems or structures that are potentially impacted by multi-unit interactions. Interactions of interest are those that have the potential to (1) impact the success criteria for an individual system or group of systems associated with Unit 2, (2) change the frequency of an initiating event considered in the Unit 2 PRA, (3) introduce an initiating event not previously considered, (4) introduce new or to alter dependencies among systems, or (5) otherwise effect the response of the plant to an initiating event. It was determined that 14 of the shared systems and structures associated with Unit 2 are potentially impacted by the return of additional units to service, and Table 3-1 shows a list of these shared systems and structures.

The review of system configurations and structures for the plant configuration under consideration utilized the results of the evaluation of all shared systems and structures performed in the Multi-Unit PRA. This review is consistent with the review of the 14 systems and structures associated with Unit 2 that were determined to be potentially impacted by the return to service of additional units. For this study, it is sufficient to review this list of shared systems and structures because the plant configuration modeled in the Multi-Unit PRA is bounding, and all of the shared systems and structures impacted by the return of Unit 3 to service would be a subset of the shared systems and structures impacted by the return of both Units 1 and 3 to service. The control bay HVAC system has been shown to be risk insignificant and is not considered in depth in this review. A comparison of the equipment/system status in the various plant configurations (the one under consideration, and those modeled in the Rev. 1 I.O. #2 and Multi-Unit PRAs) is provided in Table 3-2. The equipment/system status may be the same in the various plant configurations considered, but the success criteria and plant response involving the shared systems may be different as discussed in the section below.

3.2 EVALUATION OF IMPACT ON SHARED SYSTEMS AND STRUCTURES

The potential impact on the shared systems and structures associated with Unit 2 when Unit 3 is returned to service can be characterized as changes in the system success criteria, changes in the initiating event frequency, or changes in the plant model with respect to those in adopted in the Rev. 1 I.O. #2 PRA model. Based on the discussion of the system configurations and shared structures, and the comparison of the equipment status in the various plant configurations, the impact on the shared systems and structures as Unit 3 is returned to service is presented below and a summary of the impact is given in Table 3-3.

3.2.1 ELECTRIC POWER SYSTEM

The return to service (return to operation or shutdown with fuel present) of Unit 3 impacts the success criteria used in the Rev. 1 I.O. #2 PRA for the analysis of the availability of individual electrical boards as loads on boards are increased. In addition, the availability of boards is impacted if they no longer are considered "dedicated" to Unit 2 service. These considerations will impact the actions considered as "recovery" actions in this study, as reflected in Table 3-4.

The loss of two large generating stations within a relatively small time window has the potential of increasing the frequency of the loss of the electrical grid. The return to power operation of Unit 3 therefore increases the likelihood of the induced loss of offsite power for initiating events, such as loss of raw cooling water, that involve a mechanism that potentially couples the response of the individual units. In addition, the nature of the plant response, as compared to the Rev. 1 I.O. #2 PRA, to the loss of offsite power will change due to the role of other shared systems, such as residual heat removal service water (RHRSW) or emergency equipment cooling water (EECW).

It was concluded that the reanalysis of portions of the electric power system was required including the assessment of the availability of individual electrical boards as well as the impact on the frequency of the loss of offsite power. Modifications to modeling the battery board and diesel generators availability are discussed in Sections 4.2.1 and 4.2.14, respectively. Changes to the frequency of loss of offsite power initiating events is discussed in Section 4.1.2.

3.2.2 CONTROL AND SERVICE AIR SYSTEM

The control air and service air systems are shared among the three units. The return to service of Unit 3 will not impact the system success criteria, but may impact the frequency of the Loss of Plant Air initiator.

It was concluded that the reexamination of the plant air system analysis was required and that reexamination included a review of the success criteria for the system, the assessment of the frequency of the Loss of Plant Air initiator, and the plant response modeled for that initiator. The results of reexamining the frequency of the Loss of Plant Air initiator are given in Section 4.1.4.

3.2.3 RAW COOLING WATER SYSTEM

The raw cooling water system serves all three units. The return to service of Unit 3 impacts both the system success criteria as well as the frequency of the initiator Loss of Raw Cooling Water. These changes are described in Section 4.2.2.

3.2.4 TURBINE BUILDING

The turbine building is shared among the units. Flooding events in the turbine building were explicitly addressed in the Rev. 1 I.O. #2 PRA. As Unit 3 is returned to service, both the frequency and plant response to such flooding events were reassessed. The results and their impact on the plant model are discussed in Section 4.1.1.

3.2.5 REACTOR BUILDING CLOSED COOLING WATER SYSTEM

The reactor building closed cooling water system (RBCCW) servicing Unit 3 is independent of the system that services Units 1 and 2. The return of Unit 3 to service will not impact the success criteria for the RBCCW system as modeled in the Rev. 1 I.O. #2 PRA.

It was determined that the loss of RBCCW would result in the loss of support to the drywell air compressors, and would also impact the drywell coolers. This additional impact warrants the loss of RBCCW as a specific initiator category. The required changes are described in Section 4.1.3. Changes required to the systems analysis are described in Section 4.2.5.

3.2.6 REACTOR BUILDING (SECONDARY CONTAINMENT SYSTEM)

The reactor building is shared among the three units and is divided into three reactor zones and a common refueling zone. When Unit 3 is returned to service, an indirect interaction is created if a severe incident (such as extensive core damage) were to occur in Unit 3. In such a case, the accessibility of the Unit 2 reactor building will be affected.

It was concluded that the operator actions associated with reactor building entry when a severe event on one unit or in the common refueling zone impacts the habitability of the other reactor zones will most likely not be possible. The model change implemented to reflect this dependency is discussed in Section 4.2.14.

3.2.7 CONDENSER CIRCULATING WATER SYSTEM

In the normal mode of operation, this system is unitized. In the shutdown mode, with all of the units down and with the reactors streaming to the condensers via the turbine bypass system, only a small amount of condenser circulating water (CCW) flow is required to maintain normal condenser vacuum. The plant design provides circulating water interties so that only one CCW pump can provide condensing water to all shutdown units. In the modeled plant configuration, with Unit 2 initially at power, the CCW interties are not considered.

Failures in the CCW system could potentially lead to flooding of the turbine building. The frequency of such events is reevaluated in Section 4.1.1.

3.2.8 PUMPING STATION (INTAKE BUILDING)

The RHR service water pumps and the emergency equipment cooling water pumps are located in four compartments of the pumping station. As Unit 3 comes on line, the frequency and plant response to such flooding events as modeled in the Rev. 1 I.O. #2 PRA required reevaluation. The reassessment of the frequency of and plant response to flooding of one of these compartments with Unit 3 returned to service is addressed in Section 4.1.5.

3.2.9 CONTROL ROD DRIVE HYDRAULIC SYSTEM

A common control rod drive (CRD) hydraulic system pump is shared by Units 1 and 2. In the Rev. 1 I.O. #2 PRA, credit was taken for that pump as if it were assigned solely to Unit 2. As Unit 3 returns to service, the availability of that swing pump to service Unit 2 will not be impacted.

As stated in Section 4.2.4, it was concluded that the Rev. 1 I.O. #2 PRA success criteria for the control rod drive hydraulic system analysis is valid when Unit 3 is returned to service.

3.2.10 RHR CROSS-CONNECTION AND STANDBY COOLANT SUPPLY SYSTEM

The use of the residual heat removal service water system for vessel injection via cross-connecting selected portions of the residual heat removal (RHR) systems in adjacent units is provided at the plant. Credit for such alignments is taken in the Rev. 1 I.O. #2 PRA on a limited basis; that is, only from Unit 1 to Unit 2. As Unit 3 is returned to service, cross-connecting Unit 3 to Unit 2 will also be available. The availability of this alignment is dependent on the status of Unit 3.

It was concluded that updating the features represented by the standby coolant supply system features (as contained in the RHR system analysis) was required to reflect the condition of Unit 3 having returned to service. This consideration is addressed in Section 4.2.8.

3.2.11 RESIDUAL HEAT REMOVAL SERVICE WATER SYSTEM

The RHRSW system is shared between the units and is explicitly modeled in the Rev. 1 I.O. #2 PRA. As Unit 3 is returned to service, the success criteria associated with the RHRSW system change as additional loads are placed on the system.

The update of the success criteria for the RHRSW system is discussed in Section 4.2.10.

3.2.12 EMERGENCY EQUIPMENT COOLING WATER SYSTEM

The EECW system is shared between the units and is explicitly modeled in the Rev. 1 I.O. #2 PRA. With Unit 3 returned to service, the success criteria associated with the EECW system was reviewed and determined not to change.

The success criteria for the EECW system is discussed in Section 4.2.10.

3.2.13 FIRE PROTECTION SYSTEM

The fire protection system is shared among the units. Of potential interest in the PSA is the one diesel-driven fire pump that could provide flow to the vessel under station blackout conditions. The return to service of Unit 3 would impact the availability of this pump to serve Unit 2. However, in the current model, the use of the fire protection system to provide flow to the vessel is not considered.

3.2.14 REACTOR BUILDING AND CONTROL BAY VENTILATION AND COOLING SYSTEMS

A discussion of the impact of failure of these systems on core damage frequency is given in Section 2.

3.3 SYSTEM SUCCESS CRITERIA

The results of the evaluation of the impact on the shared systems and structures associated with Unit 2 when Unit 3 is returned to service indicated that the system success criteria, the frequency of initiating event, or the plant model adopted in the Rev. 1 I.O. #2 PRA model required modification. To establish the system success criteria for the plant configuration under consideration, those criteria adopted in the Rev. 1 I.O. #2 and Multi-Unit PRAs are first reviewed. The success criteria for the shared systems in the plant configuration under consideration are then inferred from those adopted in the two PRAs. The success criteria from the Rev. 1 I.O. #2 and Multi-Unit PRAs are either directly applicable to the plant configuration being considered, or they are conservative when used in the PSA model for the plant configuration under consideration. Table 3-4 summarizes the success criteria for shared systems in the PSA model for the plant configuration being considered as well as the criteria used in the Rev. 1 I.O. #2 and Multi-Unit PRAs.

Table 3-1. Shared Systems and Structures Associated with Unit 2 and Impacted By the Return of Additional Units to Service
Electric Power System*
Control and Service Air System
Raw Cooling Water System
Turbine Building and Radwaste Building
Reactor Building Closed Cooling Water System
Reactor Building (Secondary Containment System)
Condenser Circulating Water System
Pumping Station (Intake Building)
Control Rod Drive Hydraulic System
RHR Cross-Connection and Standby Coolant Supply System
Residual Heat Removal Service Water System
Emergency Equipment Cooling Water System
Fire Protection System
Reactor Building and Control Bay Ventilation and Cooling Systems
*Includes offsite power system (switchyard, station service transformers, and normal auxiliary power switchboards), plant preferred and nonpreferred AC system, auxiliary DC power supply and distribution system, 250V DC power supply system, and standby AC power system.

Table 3-2 (Page 1 of 2). Comparison of Equipment Status in the Different Plant Configurations

System	Equipment Status in Unit 2 PRA	Equipment Status in Multi-Unit PRA	Equipment Status in the Plant Configuration with Unit 1 Remaining in Layup
Electric Power			
AC Power	Switchgear, buses, and boards are nominally available to power all equipment associated with Units 1, 2, and 3. Unit 3 boards are available to serve Unit 2 loads by crosstieing the boards.	Switchgear, buses, and boards are nominally available to power all equipment associated with Units 1, 2, and 3. Selected Unit 3 boards may be available to serve Unit 2 loads since the loads on the affected Unit 3 boards are increased and they are no longer considered "dedicated" to Unit 2 service. Similarly, selected Unit 2 boards may be available to serve Unit 3 loads.	Switchgear, buses, and boards are normally available to power equipment associated with Units 2 and 3. Selected Unit 3 boards may be available to serve Unit 2 loads since the loads on the affected Unit 3 boards are increased and they are no longer considered "dedicated" to Unit 2 service. Similarly, selected Unit 2 boards may be available to serve Unit 3 loads.
DC Power	Boards are nominally available to support all equipment associated with Units 1, 2, and 3. Unit 3 boards are available to Unit 2 via crosstieing the boards.	Boards are normally available to support all equipment associated with Units 1, 2, and 3. Selected battery boards may be available to serve Unit 2 loads since the loads on the affected Unit 3 boards are increased and they are no longer considered "dedicated" to Unit 2 service.	Boards are normally available to support equipment associated with Units 2 and 3. Selected battery boards may be available to serve Unit 2 loads since the loads on the affected Unit 3 boards are increased and they are no longer considered "dedicated" to Unit 2 service.
Diesel Generators	All eight diesel generators available.	All eight diesel generators available.	All eight diesel generators available.
Control and Service Air	Two compressors are fully loaded, with the other two compressors running but unloaded or on standby.	Two compressors are fully loaded, with the other two compressors running but unloaded or on standby.	Two compressors are fully loaded, with the other two compressors running but unloaded or on standby.
Raw Cooling Water	Although interconnected, the portion of the system that serves Unit 3 is independent of that portion that serves Units 1 and 2.	Although interconnected, the portion of the system that serves Unit 3 is independent of that portion that serves Units 1 and 2.	The entire system is modeled with the portion serving Unit 2 dependent on the portion serving Unit 3 and vice versa.
Turbine Building and Radwaste Building	Buildings shared among all three units.	Buildings shared among all three units.	Buildings shared among all three units.
Reactor Building Closed Cooling Water	Unit 2 RBCCW pumps 2A and 2B are normally operating, and the common RBCCW pump 1C is dedicated to Unit 2.	Unit 2 RBCCW pumps are normally operating, and the common RBCCW pump 1C is available to Unit 1, 2, or 3.	Unit 2 RBCCW pumps are normally operating, and the common RBCCW pump 1C is available to Unit 1, 2, or 3.
Reactor Building (Secondary Containment System)	Building shared among all three units.	Building shared among all three units.	Building shared among all three units.
Condenser Circulating Water	Three Unit 2 CCW pumps are initially operating; pumps from other units in standby with interties between the units.	All nine of the CCW pumps are initially operating with the interties between the units closed.	The three Unit 2 CCW pumps are initially operating and the number of Unit 3 CCW pumps operating depends on the status of Unit 3. The interties between the units are closed.
Pumping Station (Intake Building)	The pumping station contains RHRSW pumps and the EECW pumps that are shared among the units.	The pumping station contains RHRSW pumps and the EECW pumps that are shared among the units.	The pumping station contains RHRSW pumps and the EECW pumps that are shared among the units.

Table 3-2 (Page 2 of 2). Comparison of Equipment Status in the Different Plant Configurations

System	Equipment Status in Unit 2 PRA	Equipment Status in Multi-Unit PRA	Equipment Status in the Plant Configuration with Unit 1 Remaining in Layup
Control Rod Drive Hydraulic	Unit 2 CRD pump 2A is normally running, and the common control CRD swing pump is dedicated to Unit 2.	Unit 2 CRD pump 2A is normally running, and the common control CRD swing pump is shared by Units 1 and 2.	Unit 2 CRD pump 2A is normally running, and the common control CRD swing pump is dedicated to Unit 2.
RHR Cross-Connection and Standby Coolant Supply	Cross-connecting a selected portion of the RHR systems from Unit 2 to Unit 1 is available.	Cross-connecting between Units 2 and 1, and between Units 2 and 3 are available.	Cross-connecting between Units 2 and 1 is maintained available, and crosstieing between Units 2 and 3 is dependent on the status of Unit 3.
Residual Heat Removal Service Water	Four RHRSW pumps are designated to provide RHR function, and four RHRSW pumps are swing pumps. The latter can replace designated EECW pumps when their corresponding EECW pumps are taken off-line.	Four RHRSW pumps are designated to provide RHR function, and four RHRSW pumps are swing pumps. The latter can replace designated EECW pumps when their corresponding EECW pumps are taken off-line.	Four RHRSW pumps are designated to provide RHR function, and four RHRSW pumps are swing pumps. The latter can replace designated EECW pumps when their corresponding EECW pumps are taken off-line.
Emergency Equipment Cooling Water	The EECW north and south header are each supplied by two RHRSW pumps with one pump in each header normally running.	The EECW north and south header are each supplied by two RHRSW pumps with one pump in each header normally running.	The EECW north and south header are each supplied by two RHRSW pumps with one pump in each header normally running.

Table 3-3. Summary of Potential Impact on Systems and Structures Associated with Unit 2			
System or Structure	System Success Criteria or Systems Analysis	Initiating Event Frequency	Plant Model
Electric Power System	X	X	X
Control and Service Air System	X	X	X
Raw Cooling Water System	X	X	X
Turbine Building* and Radwaste Building	--	X	X
Reactor Building Closed Cooling Water System	X	X	X
Reactor Building (Secondary Containment System)**	--	--	X
Condenser Circulating Water System	--	X	--
Pumping Station (Intake Building)	--	X	X
Control Rod Drive Hydraulic System	X	--	--
RHR Cross-Connection and Standby Coolant Supply System	X	--	X
Residual Heat Removal Service Water System	X	--	X
Emergency Equipment Cooling Water System	X	--	X
*Impacts nature and frequency of turbine flood. **May impact local manual operations in reactor building.			

Table 3-4 (Page 1 of 4). Success Criteria for Plant Configuration Under Consideration

System or Top Event	Initiating Event	Rev. 1 I.O. #2 PRA Success Criteria	Multi-Unit PRA Success Criteria	Success Criteria for Units 2 and 3 with Unit 1 Remaining in Layup	Impact on PSA Event Model for Units 2 and 3 with Unit 1 Remaining in Layup
Offsite Grid	LOSP L500PA L500U2	The offsite 500-kV and 161-kV grids are to remain available for 24 hours. (Only one category of loss of 500-kV grid was necessary).	Same as Rev. 1 I.O. #2 PRA. (Both categories of loss of 500-kV grid were considered).	Same as Rev. 1 I.O. #2 PRA. (Both categories of loss of 500-kV grid were considered).	All units at power will trip on loss of 500-kV to plant (L500PA). Loss of 500-kV to Unit 2 (L500U2) will trip Unit 2 only. The L500PA and L500U2 frequencies developed for the Multi-Unit PRA are used for this study.
Recover Onsite/ Offsite Power	N/A	Recover offsite power within 30 minutes or within 6 hours.	Recover offsite power to reenergize the shutdown boards. No credit for diesel generator recovery.	Recover offsite power to reenergize the shutdown boards. Recovery of diesel generator C given failure of local HVAC is considered.	The number of diesel generators available for each operating unit/ shutdown board becomes more limited. Offsite power recovery analysis is applicable to the three types of LOSP initiators (LOSP, L500PA, and L500U2) under this plant configuration.
Common Unit 1/ Unit 2 Accident Signal	N/A	N/A	This was modeled as Top Event CASG.	N/A	Unit 1 is in extended layup. The common Unit 1/Unit 2 accident signal is not applicable to this plant configuration.
4-kV Shutdown Boards; 480V Shutdown Boards; 480V RMOV Boards	N/A	Remain available for 24 hours.	Remain available for 24 hours.	Remain available for 24 hours.	No impact.
4-kV Shutdown Board Power Recovery	N/A	Specifically, recovery of shutdown boards B and/or D was considered. The recovered shutdown board(s) must remain available for 24 hours.	Diesel/4-kV shutdown board load limit will influence the combinations of boards to be recovered and boards supplying power. However, only the recovery of shutdown boards B and/or D will be considered for multi-unit scenarios.	Diesel/4-kV shutdown board load limit will influence the combinations of boards to be recovered and boards supplying power. However, only the recovery of shutdown board D is considered for selected scenarios.	4-kV shutdown boards associated with the other operating unit (Unit 3) are required by the unit at power and shutdown. Crosstieing boards in support of Unit 2 shutdown will be limited by the maximum load capability of the bus and or diesel combination.
4-kV Unit Board Power Recovery (Backfeed from Diesel Generators)	N/A	This feature was not implemented in this study.	This feature was not implemented in this study.	This feature was not implemented in this study.	Recovery action not implemented in this study.

Table 3-4 (Page 2 of 4). Success Criteria for Plant Configuration Under Consideration

System or Top Event	Initiating Event	Rev. 1 I.O. #2 PRA Success Criteria	Multi-Unit PRA Success Criteria	Success Criteria for Units 2 and 3 with Unit 1 Remaining in Layup	Impact on PSA Event Model for Units 2 and 3 with Unit 1 Remaining in Layup
250V DC Battery Charger 2B	N/A	Remain available to support the loss of the normal charger for battery board 1, 2, or 3. Only the recovery of battery board 2 or 3 was considered in the Rev. 1 I.O. #2 PRA.	Success criteria remains the same. The charger unavailability will change.	Success criteria remains the same. The charger unavailability will change.	The charger may be in use by Unit 3 in supporting maintenance.
Control and Service Air System	Loss of Plant Air	Requires at least two of the four control air compressors to supply all three air receiver and the Unit 2 air dryer train. This is conservative since per Design Criteria BFN-50-732, Rev. 2, January 31, 1991, the plant control air system requires one of the four compressors if only Unit 2 is in operation.	The success criterion for the system requires three compressors in operation when three units are in operation.	The success criterion for the system requires three compressors in operation when three units are in operation.	The demands on the plant air system may increase as more units are at power. The initiating event frequency is based on industry experience and does not change when applied to this plant configuration. A review of a recent plant modification to sectionalize units given a piping failure determined that the modification would not significantly impact the quantitative system analysis results.
Raw Cooling Water System	LRCW	Two of six raw cooling water (RCW) normally operating pumps modeled as two of three Unit 1 or two of three Unit 2 normally operating pumps must be available. Pump 1D replaces a normally operating pump that is in maintenance.	The following assumption on the success criteria is made: two of three Unit 1 and two of three Unit 2 pumps must be available (two are required per operating unit). This is modeled as four of six RCW pumps be available. Pump 1D is available to replace a Unit 2 pump in maintenance if itself is not in maintenance or it is not being used to replace a Unit 1 pump in maintenance. Unit 3 RCW is independent, and two of the five Unit 3 pumps were assumed for success.	Any four pumps.	Required changes to the system model and the initiating event frequency. See Section 4.2.2.
Turbine Building	FLTB	N/A	N/A	N/A	Frequency of flooding reevaluated. See Section 4.1.1.
Reactor Building Closed Cooling Water	LRBCCW	Pumps 2A and 2B and their associated heat exchangers must remain in service for 24 hours. Pump 1C replaces a normally operating pump that is in maintenance.	The success criteria remains the same. The system analysis was changed to reflect possible alignment of pump 1C to Unit 1.	The success criteria remains the same. Pump 1C could support Unit 2 or 3.	Same as Rev. 1 I.O. #2 PRA. The initiating event LRBCCW was introduced in the Multi-Unit PRA and is considered in the current analysis.

Table 3-4 (Page 3 of 4). Success Criteria for Plant Configuration Under Consideration

System or Top Event	Initiating Event	Rev. 1 I.O. #2 PRA Success Criteria	Multi-Unit PRA Success Criteria	Success Criteria for Units 2 and 3 with Unit 1 Remaining in Layup	Impact on PSA Event Model for Units 2 and 3 with Unit 1 Remaining in Layup
Reactor Building (Secondary Containment)	N/A	Isolate all three-reactor zones and the common refueling zone.	A new top event (ACM) to specify degraded scenarios on other unit(s) has been added representing a flag for those events that may involve reactor building entry.	The new top event (ACM) introduced in the Multi-Unit PRA has been implemented in the current analysis to specify when a degraded scenario occurs on Unit 3, thus impacting the ability to enter the Unit 2 reactor building.	An accident in Unit 3 may impact the habitability of the Unit 2 reactor building. This would then limit the capability of remote manual actions by operators in response to events at Unit 2. Event tree structure, logic rules, as well as new operator assessment from Multi-Unit PRA are applicable to this plant configuration.
Pumping Station (Intake Building)	FLPH1	N/A	N/A	N/A	The plant model already considers that four different sets of pumps could be lost due to this initiator. The initiating event frequency considers the contribution by three units.
Control Rod Drive Hydraulic	N/A	The control rod drive hydraulic system is available for 24 hours to act as a source of vessel makeup for reactor level control. Depending on the circumstances, either pump 2A is sufficient for makeup, or pumps 2A and 1B ("enhanced" flow) must act together.	The success criteria remains the same. The system analysis was changed to reflect possible assignment of pump 1B to Unit 2.	The control rod drive hydraulic system is available for 24 hours to act as a source of vessel makeup for reactor level control. Depending on the circumstances, either pump 2A is sufficient for makeup, or pumps 2A and 1B ("enhanced" flow) must act together.	The model developed for the Rev. 1 I.O. #2 PRA is applicable.
RHR Cross-Connection and Standby Coolant Supply	N/A	1. Unit 1 RHR pumps 1B and 1D can be aligned to support Unit 2 suppression pool cooling. 2. RHRSW pumps D1 and D2 are available to align to the Unit 2 RHR loop I header providing an alternate standby coolant supply.	In addition to Rev. 1 I.O. #2 PRA success criteria, the following are available to support Unit 2: 1. RHRSW pumps B1 and B2 are available to align to Unit 2 RHR loop II header providing additional standby coolant supply. 2. Unit 3 RHR pumps 3A and 3C can be aligned to support Unit 2 suppression pool cooling.	In addition to Rev. 1 I.O. #2 PRA success criteria, the following are available to support Unit 2: 1. RHRSW pumps B1 and B2 are available to align to Unit 2 RHR loop II header providing additional standby coolant supply. 2. Unit 3 RHR pumps 3A and 3C can be aligned to support Unit 2 suppression pool cooling. However, the availability of the Unit 3 RHR system is dependent on the status of Unit 3.	Both Units 1 and 3 RHR pumps can be aligned to support Unit 2 suppression cooling and alternate injection. In addition, specific RHR service water pumps can be used to provide alternate standby coolant supply. The model takes credit for RHRSW pumps B1 and B2 for Unit 2 standby coolant supply, and RHR pumps 3A and 3C for Unit 2 suppression pool cooling and alternate injection.

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Table 3-4 (Page 4 of 4). Success Criteria for Plant Configuration Under Consideration

System or Top Event	Initiating Event	Rev. 1 I.O. #2 PRA Success Criteria	Multi-Unit PRA Success Criteria	Success Criteria for Units 2 and 3 with Unit 1 Remaining in Layup	Impact on PSA Event Model for Units 2 and 3 with Unit 1 Remaining in Layup
RHR Service Water	N/A	At least one of the four RHR heat exchangers must be supplied with cooling water from an associated RHRSW pump for shutdown cooling. For ATWS conditions, all four RHR heat exchangers with cooling water from the associated RHRSW pump are available for suppression pool cooling. (The model developed requires all three RHR heat exchangers.)	At least two RHR pumps supplying cooling water to the associated heat exchangers (for transients only). For all other events, the success criteria is the same as the Rev. 1 I.O. #2 PRA.	One pump per unit (not on same header) for non-ATWS conditions. For ATWS conditions, four RHR heat exchangers are required.	Because the trains of RHRSW are modeled separately in the support tree, the systems analysis will not change. The event tree modeling accounts for the use of specific pumps by specific units (heat exchangers). The event tree logic rules account for the RHRSW swing pumps to EECW. Specific logic rules address the requirement for four pumps in ATWS scenarios.
Emergency Equipment Cooling Water	N/A	Two of the four EECW pumps must operate for 24 hours.	The success criteria are effected if Units 1 and 3 remain in operation and the diesel generators are not running. The flow paths for three unit operation are such that three out of four pumps are required. An alternate criteria is for the model to look at the successful operation of RCW and if RCW is available (meets acceptance criteria) then two of four EECW pumps is acceptable.	Two pumps not on same end of a header.	With two units fueled, the availability of RHRSW pumps to replace EECW pumps that require maintenance will be limited. The system model remains the same as the trains are modeled in four separate top events. For two-unit shutdown scenarios (e.g., those initiated by LOSP), the new system success criteria can be implemented via the event tree logic rules. The event tree logic rules account for the RHRSW swing pumps to EECW.

Table 4-1 (Page 2 of 2). Screening of Turbine Building Flooding Events							
Event	Plant	System/Component	Plant Status	Size	Included in Initiating Event FLTB2	Applicable to Initiating Event FLTB	Comment
58	Surry	Feedwater - Elbow of MFW Pump Suction Ruptured	During Trip	Large	Yes	No	Insufficient inventory to impact RCW.
93	LaSalle 1 and 2	Circulating Water - Expansion Joint Between Pump and Discharge Valve	At Power	2,000 gpm	No	No	Flooding at the pumphouse will not cause a flood in the BFN turbine building and impact RCW.
94	Peach Bottom 3	Circulating Water - Water Box Vent Left Open	At Power	6 to 8 ft of Water in the Pump Room	No	No	Insufficient flood water to impact RCW. Flooding at the pumphouse will not cause a flood in the BFN turbine building.

5. REFERENCES

1. "Browns Ferry Nuclear Plant Unit 2 Probabilistic Risk Assessment Individual Plant Examination," Revision 0, R11 921007838, September 1992.

2. "Browns Ferry Multi-Unit Probabilistic Risk Assessment," R08 950413896, January 1995.

3. Johnson, D. H., et al., "Browns Ferry Nuclear Plant Unit 2 Probabilistic Safety Assessment with Unit 3 Operating," PLG, Inc., prepared for Tennessee Valley Authority, PLG-1112, Revision 0, April 1996.

4. "Browns Ferry Unit 2 Individual Plant Examination Revision 1, Interim Order No. 2," R92 950912800, September 1995.

5. PLG, Inc., "Database for Probabilistic Risk Assessment of Light Water Nuclear Power Plants," PLG-0500, 1989 (Proprietary).

6. Sandia National Laboratories, "Analysis of Core Damage Frequency: Peach Bottom, Unit 2: Internal Event Appendices," Appendix D prepared for U.S. Nuclear Regulatory Commission, NUREG-CR/4550 Volume 4, Revision 1, Part 2 (SAND86-2084), 1989.

APPENDIX A. BROWNS FERRY UNIT 2 PSA UNCERTAINTY ANALYSIS

The Browns Ferry Unit 2 PSA uncertainty analysis was performed using the group "All" defined in the model BFNU2M. The number of sequences retained in the important sequence file, "ALL.SEQ," was 2,500. The conditional split fractions in the important sequence files were replaced by the corresponding intermediate split fractions, as listed in Table A-1. The RISKMAN distribution file, CSF.DRA, was updated, incorporating modifications of top events in several systems. In addition, several database variables were developed to represent the distributions of several initiators; this is shown in Table A-2.

The total CDF for the Browns Ferry Unit 2 PSA was calculated with the following results:

- Mean 5.39E-06
- 5th Percentile 9.02E-07
- Median 2.64E-06
- 95th Percentile 1.48E-05

Table A-1 (Page 1 of 7). Split Fraction (SF) Substitutions to Support Core Damage Uncertainty Calculation for Unit 2 PSA			
Top Events in SF Group	**System**	**Split Fractions in SF Group**	**Replace SFs in the Group With**
AA, AB, AC, AD	EP	-AD1	-S110
		-AA2 -AC16 -AD30	-S303
		-AB5 -AC16 -AD30	-S303
		-AC1	-S110
		-AB1	-S110
DE, DH, DG	EP	-DH3 -DGK	-DYGH5
		-DGJ	-DYGH3
		-DE1 -DH1 -DGB	-DE1 -DXGH5
		-DGL	-DYGH3
		-DH4 -DGM	-DYGH7
		-DE1 -DH1	-DR1 -DXGH1
EA, EB, EC, ED	EECW	-EA2 -EB5 -EC10 -ED29	-EE30
		-EA1 -EB2 -ED10	-EE12
		-EA2 -EB5 -ED28	-EE27
		-EA2 -EB5 -ED30	-EE27
		-ED34	-EE19
		-EA1 -EB2 -EC4 -ED11	-EE15
		-EB1 -EC2 -ED5	-EE14
		-EA1 -EC2 -ED5	-EE13
		-EA2 -EC11 -ED32	-EE28
		-EA1 -EB2 -EC4	-EE11
		-EA2 -EB5 -EC10	-EE26
		-EC12	-EE18
		-EA2 -EB5	-EE20
		-EB6	-EE17
		-EA2	-EE16

Table A-1 (Page 2 of 7). Split Fraction (SF) Substitutions to Support Core Damage Uncertainty Calculation for Unit 2 PSA			
Top Events in SF Group	**System**	**Split Fractions in SF Group**	**Replace SFs in the Group With**
EPR30, EPR6	MISC	-EPR304 (...) -EPR64	-STA6H4
		-EPR303 (...) -EPR63	-STA6H3
		-EPR301 (...) -EPR62	-STA6H2
		-EPR301	-STA301
		-EPR302	-STA302
		-EPR303	-STA303
		-EPR304	-STA304
GA, GD, GB, GC	EP	-GA1 -GD2 -GB4 -GC4	-DG4
		-GA1 -GB2 -GC3	-DG3
		-GC1	-DG1
		-GD1 -GC2	-DG2
		-GB1 -GC2	-DG2
		-GD3 (-FD1) -GB4 -GC7	(-FD1) -DG3
		-GA1 -GC2	-DG2
		-GA1 (-FB1) -GC6	(-FB1) -DG2
		(-FA1) -GB3 -GC6	(-FA1) -DG2
		-GC5	-DG1
		-GA1 -GD2 (-FB1) -GC7	-FB1 -DG3
		-GD1 -GB2 -BC3	-DG3
		-GA1 -GD2 -GC3	-DG3
		-GC8	-DG1
		-GA1 -GB2	-DG2
		-GD1 -GB2	-DG2
		-GB1	-DG1
		-GA1 -GD2 -GB4	-DG3
		-GB3	-DG1

Table A-1 (Page 3 of 7). Split Fraction (SF) Substitutions to Support Core Damage Uncertainty Calculation for Unit 2 PSA			
Top Events in SF Group	**System**	**Split Fractions in SF Group**	**Replace SFs in the Group With**
		-GA1 (-FD1) -GB4	(-FD1) -DG2
		-FA1 -GD3 -GB4	-FA1 -DG2
		-GD1	-DG1
		-GA1 -GD2	-DG2
		-GA1	-DG1
GE, GG, GF, GH	EP	-GH1	-DG31
		-GE1 -GH2	-DG32
		-GH3	-DG31
		-GG1 -GH2	-DG32
		-GF1 -GH2	-DG32
		-GE1 -GF2 -GH4	-DG33
		-GE1 -GG2 -GH4	-DG33
		-GE1 -GF2	-DG32
		-GF1	-DG31
		-GE1 -GG2 -GF4	-DG33
		-GF3	-DG31
		-GG1 -GF2	-DG32
		-GG1	-DG31
		-GE1 -GG2	-DG32
		-GG3	-DG31
		-GE1	-DG31
HXA, HXC, HXB, HXD	RHR	-HXA1 -HXC2 -HXB5 -HXD7	-HX4
		-HXA1 -HXB2 -HXD5	-HX3
		-HXD10	-HX1
		-HXA1 -HXC2 -HXD6	-HX3

Table A-1 (Page 4 of 7). Split Fraction (SF) Substitutions to Support Core Damage Uncertainty Calculation for Unit 2 PSA			
Top Events in SF Group	**System**	**Split Fractions in SF Group**	**Replace SFs in the Group With**
		-HXD1	-HX1
		-HXB3	-HX1
		-HXB6	-HX1
		-HXB1	-HX1
		-HXC1	-HX1
		-HXA1	-HX1
NPI, NPII	SAI	-NPI1 -NPII2	-NP2
PX1, PX2	SAI	-PX23	-PXI
		-PX11 -PX22	-PXII
		-PX21	-PXI
		-PX11	-PXI
RCI, HPI	RCIC/HPCI	-RCIC -HPI4	-HRSSY1
		-HPI6	-HRSHP1
		-HPI1	-HRSHP2
		-HPI2	-HRSHP1
		-HPI4	-HRSSY1
		-RCI1	-HRSRC1
RCL, HPL	RCIC/HPCI	-RCL1 -HPL3	-HRXSY1
		-HPL5	-HRXHP1
		-HPL1	-HRXHP1
		-HPL3	-HRXSY1
		-RCL1	-HRXRC1
RPA, RPC, RPB, RPD	RHR	-RPA1 -RPC2 -RPB3 -RPD4	-RPX4
		-RPA1 -RPC2 -RPD10	-RPX3
		-RPB5 -RPD9	-RPX2AC
		-RPA1 -RPB2 -RPD3	-RPX3

Table A-1 (Page 5 of 7). Split Fraction (SF) Substitutions to Support Core Damage Uncertainty Calculation for Unit 2 PSA			
Top Events in SF Group	**System**	**Split Fractions in SF Group**	**Replace SFs in the Group With**
		PRPB1 -RPD2	-RPX2AC
		-RPA1 -RPD7	-RPX2AC
		-RPC3 -RPD7	-RPX2AC
		-RPB2 -RPD9	-RPX2AC
		-RPA1 -RPD9	-RPX2AC
		-RPD9	-RPX1
		-RPA1 -RPB6 -RPD10	-RPX3
		-RPC3 -RPB6 -RPD10	-RPX3
		-RPB6 -RPD10	-RPX2AC
		-RPA1 (-HX1) -RPD2	(-HX1) -RPX2AC
		-RPA1 -RPC2 (-HX1) -RPD3	(-HX1) -RPX3
		-RPD5	-RPX1
		-RPA1 -RPC2 -RPD3	-RPX3
		-RPD1	-RPX1
		-RPD8	-RPX1
		-RPA1 -RPC2 -RPD4	-RPX3
		-RPB6	-RPX1
		-RPB1	-RPX1
		-RPA1 -RPB2	-RPX2AB
		-RPA1 -RPC2	-RPX2AC
		-RPC3	-RPX1
		-RPC1	-RPX1
		PRPA1	-RPX1
RS, RT	EP	-RS1 -RT2	-SDBD22
		-RT1	-SDBD21
		-RT3	-SDBD21

Table A-1 (Page 6 of 7). Split Fraction (SF) Substitutions to Support Core Damage Uncertainty Calculation for Unit 2 PSA			
Top Events in SF Group	**System**	**Split Fractions in SF Group**	**Replace SFs in the Group With**
		-RS1	-SDBD21
SW2A, SW1A, SW2C, SW1C	RHRSW	-SW1C1	-NB
		-SW1C7	-NB
		-SW2C1 -SW1C2	-NAC
		-SW2A1 -SW1A2 -SW2C4 -SW1C6	-NABCD
		-SW2C1	-NA
		-SW1A1	-NB
		-SW2A1 -SW1A2	-NAC
		-SW2A1	-NA
SW2B, SW1B, SW2D, SW1D	RHRSW	-SW2B1 -SW1B2 -SW2D4 -SW1D6	-SABCD
		-SW1D7	-SB
		-SW1D14	-SB
		-SW1D16	-SB
		-SW1D17	-SB
		-SW1D11	-SB
		-SW2D1 -SW1D2	-SAC
		-SW2B1 -SW1B2 -SW2C1 -SW1C2 -SW2D4 -SW1D6	-SW2C1 -SW1C2 -SABCD
		-SW2B1 -SW2D9 -SW1D13	-SABC
		-SW1D1	-SB
		-SW2D1	-SA
		-SW2D6	-SA
		-SW2D7	-SA
		-SW2D5	-SA
		-SW1B3	-SB

Table A-1 (Page 7 of 7). Split Fraction (SF) Substitutions to Support Core Damage Uncertainty Calculation for Unit 2 PSA			
Top Events in SF Group	**System**	**Split Fractions in SF Group**	**Replace SFs in the Group With**
		-SW1B1	-SB
		-SW2B1 -SW1B2	-SAC
		-SW2B1	-SA
Initiator	RBCCW	LRBCCW	RBCIE

Table A-2. Database Variables Representing Distribution of Initiating Events (Lognormal)			
DPD Variable	**Mean**	**Range Factor**	**Initiating Events**
HS2	0.085	4	LOCV PLOC PLFW
HS3	0.057	4	CIV
HS4	0.3	2.5	LOFW
HS5	0.126	5	LOPA
HS6	0.142	3.5	PRFC TTWB
HS7	0.09	4	LOSP L500PA L500U2

APPENDIX B. LISTING OF TOP 100 SEQUENCES

Figure B-1 presents a listing of the top 100 sequences for the Unit 2 PSA model.

MODEL Name: BFNU2M — Top-Ranking Sequences Contributing to Group : ALL Frequency — 07:56:48 09 MAY 1996
ALL = ALL DAMAGE STATES EXCEPT SUCCESS

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
1	TURBINE TRIP - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN - OPERATOR FAILS TO CONTROL LPI DURING ATWS	- VESSEL INJECTION WITH CRDHS UNAVAILABLE	OIAV	1.01E-07	1.88
2	TURBINE TRIP - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - OPERATOR FAILS TO START SLC	- RPV DEPRESSURIZATION	MKCV	7.52E-08	1.40
3	TURBINE TRIP - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - STANDBY LIQUID CONTROL SYSTEM UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN		MIAV	7.25E-08	1.35
4	TOTAL LOSS OF OFFSITE POWER - DG A UNAVAILABLE - DG D UNAVAILABLE - DG B UNAVAILABLE - DG C UNAVAILABLE - FAILURE TO RECOVER OFFSITE POWER IN 30 MINUTES - COMMON CAUSE COUPLING OF UNIT 1/2 AND UNIT 3 DIESELS - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - FAILURE TO RECOVER ELECTRIC POWER IN 6 HOURS	- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - 4KV SD BD A UNAVAILABLE - 480V SHUTDOWN BOARD 1A - 480V RMOV BD 1A POWER UNAVAILABLE - 480V DIESEL AUX. BD A POWER UNAVAILABLE - 4KV SD BD B UNAVAILABLE - 480V SHUTDOWN BOARD 2A - 480V RMOV BD 2A POWER UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - 120 V RPS BUS "A" UNAVAILABLE - 4KV SD BD C UNAVAILABLE - 480V SHUTDOWN BOARD 1B - 480V RMOV BD 1B POWER UNAVAILABLE - 4KV SD BD D UNAVAILABLE - 480V SHUTDOWN BOARD 2B - 480V RMOV BD 2D POWER UNAVAILABLE - 480V RMOV BD 2E POWER UNAVAILABLE - 480V RMOV BD 2B POWER UNAVAILABLE - 480V RMOV BD 2C POWER UNAVAILABLE - 480V DIESEL AUX BD B POWER UNAVAILABLE - 120 V RPS BUS "B" UNAVAILABLE - 120 V I&C BUS "2B" UNAVAILABLE - 4KV UNIT BD 3A UNAVAILABLE - 4KV UNIT BD 3B UNAVAILABLE - DG 3A UNAVAILABILITY - 4KV SD BD 3EA AND 480V SD BD 3A POWER UNAVAILABLE - 480V SHUTDOWN BOARD 3A - 480V DIESEL AUX BD 3EA POWER UNAVAILABLE - 120 V I&C BUS "2A" UNAVAILABLE - DG 3C UNAVAILABLE - 4KV SD BD 3EC AND 480V SD BD 3B UNAVAILABLE - DG 3B UNAVAILABLE - 4KV SD BD 3EB UNAVAILABLE - 480V SHUTDOWN BOARD 3B - 480V DIESEL AUX BD 3EB POWER UNAVAILABLE - DG 3D UNAVAILABLE - 4KV SD BD 3ED UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - EECW PUMP A UNAVAILABLE - EECW PUMP B UNAVAILABLE - EECW PUMP C UNAVAILABLE	PIGX	6.81E-08	1.27

Figure B-1 (Page 1 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

MODEL Name: BFNU2M — Top-Ranking Sequences Contributing to Group : ALL Frequency — 07:56:48 09 MAY 1996
ALL = ALL DAMAGE STATES EXCEPT SUCCESS

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
		- EECW PUMP D UNAVAILABLE - RX BUILDING COMPONENT COOLING WATER SYSTEM UNAVAILABLE - RHRSW PUMP A2 UNAVAILABLE - RHRSW PUMP A1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP B2 UNAVAILABLE - RHRSW PUMP B1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP C2 UNAVAILABLE - RHRSW PUMP C1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP D2 UNAVAILABLE - RHRSW PUMP D1 (SWING PUMP) UNAVAILABLE - PLANT CONTROL AIR SYSTEM UNAVAILABLE - DRYWELL CONTROL AIR SYSTEM UNAVAILABLE - CONTAINMENT ATMOSPHERIC DILUTION - OPERATOR FAILS TO RECOVER EECW (START SWING PUMP) - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - RCIC UNAVAILABLE LONG TERM - HPCI UNAVAILABLE LONG TERM - VESSEL INJECTION WITH CRDHS UNAVAILABLE - OPERATOR FAILS TO MANUALLY START RHR/CORE SPRAY - FAILURE TO RECOVER 480V RMOV BDS 2A OR 2B - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - U1 TO U2 RHR CROSS CONNECT UNAVAILABLE - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE - U3 TO U2 RHR CROSS CONNECT UNAVAILABLE - OPERATOR FAILS TO ESTABLISH TORUS COOLING - RHR LOW PRESSURE INJECTION PATH UNAVAILABLE			
5	LOSS OF RAW COOLING WATER - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RCIC UNAVAILABLE (6 HOURS) - HPCI UNAVAILABLE (6 HOURS) - RPV DEPRESSURIZATION	- RAW COOLING WATER SYSTEM UNAVAILABLE - MAIN CONDENSER UNAVAILABLE - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - VESSEL INJECTION WITH CRDHS UNAVAILABLE	MIAV	5.98E-08	1.11
6	CLOSURE OF ALL MSIVS - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - OPERATOR FAILS TO START SLC	- MSIVS FAIL TO REMAIN OPEN - RPV DEPRESSURIZATION	MXCV	5.47E-08	1.02
7	CLOSURE OF ALL MSIVS - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RCIC UNAVAILABLE (6 HOURS) - HPCI UNAVAILABLE (6 HOURS) - RPV DEPRESSURIZATION - VESSEL INJECTION WITH CRDHS UNAVAILABLE	- MSIVS FAIL TO REMAIN OPEN - RPM HARDWARE UNAVAILABLE - OPERATOR FAILS TO INHIBIT CLOSURE OF MSIVS ON LEVEL	MIAV	4.84E-08	.90
8	TOTAL LOSS OF OFFSITE POWER - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RCIC UNAVAILABLE (6 HOURS) - HPCI UNAVAILABLE (6 HOURS) - RPV DEPRESSURIZATION	- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - VESSEL INJECTION WITH CRDHS UNAVAILABLE	MIAV	4.66E-08	.87

Figure B-1 (Page 2 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

MODEL Name: BFNU2M — Top-Ranking Sequences Contributing to Group : ALL Frequency — 07:56:48 09 MAY 1996
ALL = ALL DAMAGE STATES EXCEPT SUCCESS

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
9	INTERFACING SYSTEM LOCA		NJAZ	4.63E-08	.86
10	LOSS OF RAW COOLING WATER - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN - OPERATOR FAILS TO ESTABLISH TORUS COOLING	- RAW COOLING WATER SYSTEM UNAVAILABLE - MAIN CONDENSER UNAVAILABLE - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - VESSEL INJECTION WITH CRDHS UNAVAILABLE	OLCV	4.50E-08	.84
11	SMALL LOSS OF COOLANT ACCIDENT (LOCA) - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE	- CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN - VESSEL INJECTION WITH CRDHS UNAVAILABLE	OIAV	3.63E-08	.68
12	INADVERTENT OPENING OF THREE OR MORE SRVS - OPERATOR FAILS TO ESTABLISH TORUS COOLING	- CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 3 OR MORE VALVES STUCK OPEN - OPERATOR FAILS TO ESTABLISH SHUTDOWN COOLING	OLCV	3.35E-08	.62
13	TOTAL LOSS OF OFFSITE POWER - FUEL OIL SYSTEM FOR DIESEL A UNAVAILABLE - FUEL OIL FOR DIESEL D UNAVAILABLE - FUEL OIL SYSTEM FOR DIESEL B UNAVAILABLE - FUEL OIL SYSTEM FOR DIESEL C UNAVAILABLE - FAILURE TO RECOVER OFFSITE POWER IN 30 MINUTES - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - FAILURE TO RECOVER ELECTRIC POWER IN 6 HOURS	- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - DG A UNAVAILABLE - DG D UNAVAILABLE - DG B UNAVAILABLE - DG C UNAVAILABLE - 4KV SD BD A UNAVAILABLE - 480V SHUTDOWN BOARD 1A - 480V RMOV BD 1A POWER UNAVAILABLE - 480V DIESEL AUX. BD A POWER UNAVAILABLE - 4KV SD BD B UNAVAILABLE - 480V SHUTDOWN BOARD 2A - 480V RMOV BD 2A POWER UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - 120 V RPS BUS "A" UNAVAILABLE - 4KV SD BD C UNAVAILABLE - 480V SHUTDOWN BOARD 1B - 480V RMOV BD 1B POWER UNAVAILABLE - 4KV SD BD D UNAVAILABLE - 480V SHUTDOWN BOARD 2B - 480V RMOV BD 2D POWER UNAVAILABLE - 480V RMOV BD 2E POWER UNAVAILABLE - 480V RMOV BD 2B POWER UNAVAILABLE - 480V RMOV BD 2C POWER UNAVAILABLE - 480V DIESEL AUX BD B POWER UNAVAILABLE - 120 V RPS BUS "B" UNAVAILABLE - 120 V I&C BUS "2B" UNAVAILABLE - 4KV UNIT BD 3A UNAVAILABLE - 4KV UNIT BD 3B UNAVAILABLE - FUEL OIL SYSTEM FOR DIESEL 3A UNAVAILABLE - DG 3A UNAVAILABILITY - 4KV SD BD 3EA AND 480V SD BD 3A POWER UNAVAILABLE - 480V SHUTDOWN BOARD 3A - 480V DIESEL AUX BD 3EA POWER UNAVAILABLE - 120 V I&C BUS "2A" UNAVAILABLE - FUEL OIL SYSTEM FOR DIESEL 3C UNAVAILABLE - DG 3C UNAVAILABLE - 4KV SD BD 3EC AND 480V SD BD 3B UNAVAILABLE - FUEL OIL SYSTEM FOR DIESEL 3B UNAVAILABLE - DG 3B UNAVAILABLE - 4KV SD BD 3EB UNAVAILABLE - 480V SHUTDOWN BOARD 3B	PIGX	3.26E-08	.61

Figure B-1 (Page 3 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

MODEL Name: BFNU2H — Top-Ranking Sequences Contributing to Group : ALL Frequency — 07:56:48 09 MAY 1996
ALL = ALL DAMAGE STATES EXCEPT SUCCESS

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
		- 480V DIESEL AUX BD 3EB POWER UNAVAILABLE - FUEL OIL FOR DIESEL 3D UNAVAILABLE - DG 3D UNAVAILABLE - 4KV SD BD 3ED UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - EECW PUMP A UNAVAILABLE - EECW PUMP B UNAVAILABLE - EECW PUMP C UNAVAILABLE - EECW PUMP D UNAVAILABLE - RX BUILDING COMPONENT COOLING WATER SYSTEM UNAVAILABLE - RHRSW PUMP A2 UNAVAILABLE - RHRSW PUMP A1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP B2 UNAVAILABLE - RHRSW PUMP B1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP C2 UNAVAILABLE - RHRSW PUMP C1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP D2 UNAVAILABLE - RHRSW PUMP D1 (SWING PUMP) UNAVAILABLE - PLANT CONTROL AIR SYSTEM UNAVAILABLE - DRYWELL CONTROL AIR SYSTEM UNAVAILABLE - CONTAINMENT ATMOSPHERIC DILUTION - OPERATOR FAILS TO RECOVER EECW (START SWING PUMP) - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - RCIC UNAVAILABLE LONG TERM - HPCI UNAVAILABLE LONG TERM - VESSEL INJECTION WITH CRDHS UNAVAILABLE - OPERATOR FAILS TO MANUALLY START RHR/CORE SPRAY - FAILURE TO RECOVER 480V RMOV BDS 2A OR 2B - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - U1 TO U2 RHR CROSS CONNECT UNAVAILABLE - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE - U3 TO U2 RHR CROSS CONNECT UNAVAILABLE - OPERATOR FAILS TO ESTABLISH TORUS COOLING - RHR LOW PRESSURE INJECTION PATH UNAVAILABLE			
14	LOSS OF CONDENSER VACUUM - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RCIC UNAVAILABLE (6 HOURS) - HPCI UNAVAILABLE (6 HOURS) - RPV DEPRESSURIZATION - VESSEL INJECTION WITH CRDHS UNAVAILABLE	- MAIN CONDENSER UNAVAILABLE - RFW HARDWARE UNAVAILABLE - OPERATOR FAILS TO DEPRESSURIZE USING TBV'S	MIAV	2.97E-08	.55
15	TURBINE TRIP WITHOUT BYPASS - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - OPERATOR FAILS TO START SLC	- TBVS FAIL TO RELIEVE\MAINTAIN RX PRESSURE - RPV DEPRESSURIZATION	MKCV	2.86E-08	.53
16	INADVERTENT OPENING OF ONE SRV - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - OPERATOR FAILS TO CONTROL LPI DURING ATWS	- CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN - VESSEL INJECTION WITH CRDHS UNAVAILABLE	OIAV	2.83E-08	.53
17	CLOSURE OF ALL MSIVS - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN - OPERATOR FAILS TO CONTROL LPI DURING ATWS	- MSIVS FAIL TO REMAIN OPEN - OPERATOR FAILS TO COOLDOWN USING THE TBVS - VESSEL INJECTION WITH CRDHS UNAVAILABLE	OIAV	2.74E-08	.51
18	TOTAL LOSS OF OFFSITE POWER - DG A UNAVAILABLE - DG D UNAVAILABLE - DG B UNAVAILABLE	- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE	OIAX	2.61E-08	.49

Figure B-1 (Page 4 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

MODEL Name: BFNU2H — Top-Ranking Sequences Contributing to Group : ALL Frequency — 07:56:48 09 MAY 1996
ALL = ALL DAMAGE STATES EXCEPT SUCCESS

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
	- FAILURE TO RECOVER OFFSITE POWER IN 30 MINUTES - DG 3D UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - FAILURE TO RECOVER ELECTRIC POWER IN 6 HOURS	- 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - 4KV SD BD A UNAVAILABLE - 480V SHUTDOWN BOARD 1A - 480V RMOV BD 1A POWER UNAVAILABLE - 480V DIESEL AUX. BD A POWER UNAVAILABLE - 4KV SD BD B UNAVAILABLE - 480V SHUTDOWN BOARD 2A - 480V RMOV BD 2A POWER UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - 120 V RPS BUS "A" UNAVAILABLE - 4KV SD BD D UNAVAILABLE - 480V SHUTDOWN BOARD 2B - 480V RMOV BD 2D POWER UNAVAILABLE - 480V RMOV BD 2E POWER UNAVAILABLE - 480V RMOV BD 2B POWER UNAVAILABLE - 480V RMOV BD 2C POWER UNAVAILABLE - 480V DIESEL AUX BD B POWER UNAVAILABLE - 120 V RPS BUS "B" UNAVAILABLE - 4KV UNIT BD 3A UNAVAILABLE - 4KV UNIT BD 3B UNAVAILABLE - 4KV SD BD 3ED UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - RX BUILDING COMPONENT COOLING WATER SYSTEM UNAVAILABLE - RHRSW PUMP A2 UNAVAILABLE - RHRSW PUMP A1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP C2 UNAVAILABLE - RHRSW PUMP C1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP D2 UNAVAILABLE - RHRSW PUMP D1 (SWING PUMP) UNAVAILABLE - PLANT CONTROL AIR SYSTEM UNAVAILABLE - DRYWELL CONTROL AIR SYSTEM UNAVAILABLE - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - RCIC UNAVAILABLE LONG TERM - HPCI UNAVAILABLE LONG TERM - VESSEL INJECTION WITH CRDHS UNAVAILABLE - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE - U3 TO U2 RHR CROSS CONNECT UNAVAILABLE - CS LOW PRESSURE INJECTION UNAVAILABLE - RHR LOW PRESSURE INJECTION PATH UNAVAILABLE			
19	TURBINE TRIP WITHOUT BYPASS - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RCIC UNAVAILABLE (6 HOURS) - HPCI UNAVAILABLE (6 HOURS) - RPV DEPRESSURIZATION - VESSEL INJECTION WITH CRDHS UNAVAILABLE	- TBVS FAIL TO RELIEVE\MAINTAIN RX PRESSURE - RPW HARDWARE UNAVAILABLE - OPERATOR FAILS TO DEPRESSURIZE USING TBV'S	MIAV	2.52E-08	.47
20	TURBINE TRIP - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 3 OR MORE VALVES STUCK OPEN - OPERATOR FAILS TO ESTABLISH TORUS COOLING	- OPERATOR FAILS TO ESTABLISH SHUTDOWN COOLING	OLCV	2.42E-08	.45
21	TOTAL LOSS OF OFFSITE POWER - DG A UNAVAILABLE - DG B UNAVAILABLE	- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS	PLFV	2.41E-08	.45

Figure B-1 (Page 5 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
	- DG C UNAVAILABLE - FAILURE TO RECOVER OFFSITE POWER IN 30 MINUTES - DG 3C UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - FAILURE TO RECOVER ELECTRIC POWER IN 6 HOURS	- 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - 4KV SD BD A UNAVAILABLE - 480V SHUTDOWN BOARD 1A - 480V RMOV BD 1A POWER UNAVAILABLE - 480V DIESEL AUX. BD A POWER UNAVAILABLE - 4KV SD BD B UNAVAILABLE - 480V SHUTDOWN BOARD 2A - 480V RMOV BD 2A POWER UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - 120 V RPS BUS "A" UNAVAILABLE - 4KV SD BD C UNAVAILABLE - 480V SHUTDOWN BOARD 1B - 480V RMOV BD 1B POWER UNAVAILABLE - 4KV UNIT BD 3A UNAVAILABLE - 4KV UNIT BD 3B UNAVAILABLE - 4KV SD BD 3EC AND 480V SD BD 3B UNAVAILABLE - 480V SHUTDOWN BOARD 3B - 480V DIESEL AUX BD 3EB POWER UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - EECW PUMP B UNAVAILABLE - RHRSW PUMP A2 UNAVAILABLE - RHRSW PUMP A1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP B2 UNAVAILABLE - RHRSW PUMP B1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP C2 UNAVAILABLE - RHRSW PUMP C1 (SWING PUMP) UNAVAILABLE - PLANT CONTROL AIR SYSTEM UNAVAILABLE - DRYWELL CONTROL AIR SYSTEM UNAVAILABLE - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - RCIC UNAVAILABLE LONG TERM - HPCI UNAVAILABLE LONG TERM - VESSEL INJECTION WITH CRDHS UNAVAILABLE - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - U1 TO U2 RHR CROSS CONNECT UNAVAILABLE - RHR PUMP B UNAVAILABLE - TORUS COOLING HARDWARE UNAVAILABLE - FAILURE TO RECOVER TORUS COOLING - OPERATOR FAILS TO ESTABLISH SHUTDOWN COOLING			
22	CLOSURE OF ALL MSIVS - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - STANDBY LIQUID CONTROL SYSTEM UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN	- MSIVS FAIL TO REMAIN OPEN	OIAV	2.34E-08	.44
23	PARTIAL LOSS OF FEEDWATER - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN - OPERATOR FAILS TO CONTROL LPI DURING ATWS	- VESSEL INJECTION WITH CRDHS UNAVAILABLE	OIAV	2.30E-08	.43
24	INADVERTENT (OTHER) SCRAM - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 3 OR MORE VALVES STUCK OPEN - OPERATOR FAILS TO ESTABLISH TORUS COOLING	- OPERATOR FAILS TO ESTABLISH SHUTDOWN COOLING	OLCV	2.23E-08	.42
25	TOTAL LOSS OF FEEDWATER	- RPW HARDWARE UNAVAILABLE	OIAV	2.14E-08	.40

Figure B-1 (Page 6 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
	- AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN - OPERATOR FAILS TO CONTROL LPI DURING ATWS	- VESSEL INJECTION WITH CRDHS UNAVAILABLE			
26	CLOSURE OF ALL MSIVS - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE	- MSIVS FAIL TO REMAIN OPEN - OPERATOR FAILS TO COOLDOWN USING THE TBVS - OPERATOR FAILS TO ESTABLISH TORUS COOLING	MIBV	2.00E-08	.37
27	TOTAL LOSS OF OFFSITE POWER - DG A UNAVAILABLE - DG D UNAVAILABLE - DG B UNAVAILABLE - DG C UNAVAILABLE - FAILURE TO RECOVER OFFSITE POWER IN 30 MINUTES - DG 3D UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - FAILURE TO RECOVER ELECTRIC POWER IN 6 HOURS	- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - 4KV SD BD A UNAVAILABLE - 480V SHUTDOWN BOARD 1A - 480V RMOV BD 1A POWER UNAVAILABLE - 480V DIESEL AUX. BD A POWER UNAVAILABLE - 4KV SD BD B UNAVAILABLE - 480V SHUTDOWN BOARD 2A - 480V RMOV BD 2A POWER UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - 120 V RPS BUS "A" UNAVAILABLE - 4KV SD BD C UNAVAILABLE - 480V SHUTDOWN BOARD 1B - 480V RMOV BD 1B POWER UNAVAILABLE - 4KV SD BD D UNAVAILABLE - 480V SHUTDOWN BOARD 2B - 480V RMOV BD 2D POWER UNAVAILABLE - 480V RMOV BD 2E POWER UNAVAILABLE - 480V RMOV BD 2B POWER UNAVAILABLE - 480V RMOV BD 2C POWER UNAVAILABLE - 480V DIESEL AUX BD B POWER UNAVAILABLE - 120 V RPS BUS "B" UNAVAILABLE - 120 V I&C BUS "2B" UNAVAILABLE - 4KV UNIT BD 3A UNAVAILABLE - 4KV UNIT BD 3B UNAVAILABLE - 4KV SD BD 3ED UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - EECW PUMP B UNAVAILABLE - RX BUILDING COMPONENT COOLING WATER SYSTEM UNAVAILABLE - RHRSW PUMP A2 UNAVAILABLE - RHRSW PUMP A1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP B2 UNAVAILABLE - RHRSW PUMP C2 UNAVAILABLE - RHRSW PUMP C1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP D2 UNAVAILABLE - RHRSW PUMP D1 (SWING PUMP) UNAVAILABLE - PLANT CONTROL AIR SYSTEM UNAVAILABLE - DRYWELL CONTROL AIR SYSTEM UNAVAILABLE - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - RCIC UNAVAILABLE LONG TERM - HPCI UNAVAILABLE LONG TERM - VESSEL INJECTION WITH CRDHS UNAVAILABLE - FAILURE TO RECOVER 480V RMOV BDS 2A OR 2B - RHR PUMP A UNAVAILABLE	PIGX	1.98E-08	.37

Figure B-1 (Page 7 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

MODEL Name: BFNU2M — Top-Ranking Sequences Contributing to Group : ALL Frequency — 07:56:48 09 MAY 1996
ALL - ALL DAMAGE STATES EXCEPT SUCCESS

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
		- RHR PUMP C UNAVAILABLE - U1 TO U2 RHR CROSS CONNECT UNAVAILABLE - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE - U3 TO U2 RHR CROSS CONNECT UNAVAILABLE - OPERATOR FAILS TO ESTABLISH TORUS COOLING - RHR LOW PRESSURE INJECTION PATH UNAVAILABLE			
28	SCRAM REQUIRED (MANUAL SCRAMS) - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN - OPERATOR FAILS TO CONTROL LPI DURING ATWS	- VESSEL INJECTION WITH CRDHS UNAVAILABLE	OIAV	1.94E-08	.36
29	RECIRC DISCHARGE LINE BREAK - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE	- CROSS CONNECT TO UNIT 1 RHR SYSTEM UNAVAILABLE - CROSS CONNECT TO UNIT 3 RHR SYSTEM UNAVAILABLE - OPERATOR FAILS TO INITIATE SP COOLING - CONTAINMENT VENT UNAVAILABLE	OLFV	1.93E-08	.36
30	TOTAL LOSS OF FEEDWATER - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - OPERATOR FAILS TO START SLC	- RPV DEPRESSURIZATION	MKCV	1.90E-08	.35
31	LOSS OF RAW COOLING WATER - 250 V DC CONTROL POWER FOR 4KV SD BD 3ED UNAVAILABLE - 250 V DC CONTROL POWER FOR 4KV SD BD 3EC AND 480V SD BD 3EB UNAVAILA- - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN	- 250 RMOV BD 2A UNAVAILABLE - 250 V RMOV BD 2B UNAVAILABLE - POWER SUPPLY DIVISION I UNAVAILABLE - POWER SUPPLY DIVISION II UNAVAILABLE - VESSEL LEVEL SIGNAL UNAVAILABLE - DIV I VESSEL LOW PRESSURE SIGNAL UNAVAILABLE - DIV II VESSEL LOW PRESSURE SIGNAL UNAVAILABLE - DIV I HI RX PRESS SIGNAL UNAVAILABLE - DIV II HI RX PRESS SIGNAL UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - RHRSW PUMP B1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP D1 (SWING PUMP) UNAVAILABLE - MAIN CONDENSER UNAVAILABLE - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - RCIC UNAVAILABLE (6 HOURS) - HPCI UNAVAILABLE (6 HOURS) - VESSEL INJECTION WITH CRDHS UNAVAILABLE - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE - U3 TO U2 RHR CROSS CONNECT UNAVAILABLE - TORUS COOLING HARDWARE UNAVAILABLE - CS LOW PRESSURE INJECTION UNAVAILABLE - RHR LOW PRESSURE INJECTION PATH UNAVAILABLE	PIRV	1.90E-08	.35
32	MEDIUM LOCA - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE	- CROSS CONNECT TO UNIT 1 RHR SYSTEM UNAVAILABLE - CROSS CONNECT TO UNIT 3 RHR SYSTEM UNAVAILABLE - OPERATOR FAILS TO INITIATE SP COOLING - CONTAINMENT VENT UNAVAILABLE	OLFV	1.88E-08	.35
33	TOTAL LOSS OF OFFSITE POWER - DG A UNAVAILABLE - DG D UNAVAILABLE - DG B UNAVAILABLE - DG C UNAVAILABLE - FAILURE TO RECOVER OFFSITE POWER IN 30 MINUTES - DG 3C UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS)	- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE	PLFX	1.84E-08	.34

Figure B-1 (Page 8 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

Rank No.	Sequence Description	Events	Guaranteed Events/Comments	End State	Frequency (per year)	Percent
	STATE - 0 RELIEF VALVES STUCK OPEN - FAILURE TO RECOVER ELECTRIC POWER IN 6 HOURS		- SHUTDOWN BUS 2 UNAVAILABLE - 4KV SD BD A UNAVAILABLE - 480V SHUTDOWN BOARD 1A - 480V RMOV BD 1A POWER UNAVAILABLE - 480V DIESEL AUX..BD A POWER UNAVAILABLE - 4KV SD BD B UNAVAILABLE - 480V SHUTDOWN BOARD 2A - 480V RMOV BD 2A POWER UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - 120 V RPS BUS "A" UNAVAILABLE - 4KV SD BD C UNAVAILABLE - 480V SHUTDOWN BOARD 1B - 480V RMOV BD 1B POWER UNAVAILABLE - 4KV SD BD D UNAVAILABLE - 480V SHUTDOWN BOARD 2B - 480V RMOV BD 2D POWER UNAVAILABLE - 480V RMOV BD 2E POWER UNAVAILABLE - 480V RMOV BD 2B POWER UNAVAILABLE - 480V RMOV BD 2C POWER UNAVAILABLE - 480V DIESEL AUX BD B POWER UNAVAILABLE - 120 V RPS BUS "B" UNAVAILABLE - 120 V I&C BUS "2B" UNAVAILABLE - 4KV UNIT BD 3A UNAVAILABLE - 4KV UNIT BD 3B UNAVAILABLE - 4KV SD BD 3EC AND 480V SD BD 3B UNAVAILABLE - 480V SHUTDOWN BOARD 3B - 480V DIESEL AUX BD 3EB POWER UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - EECW PUMP B UNAVAILABLE - RX BUILDING COMPONENT COOLING WATER SYSTEM UNAVAILABLE - RHRSW PUMP A2 UNAVAILABLE - RHRSW PUMP A1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP B2 UNAVAILABLE - RHRSW PUMP B1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP C2 UNAVAILABLE - RHRSW PUMP C1 (SWING PUMP) UNAVAILABLE - PLANT CONTROL AIR SYSTEM UNAVAILABLE - DRYWELL CONTROL AIR SYSTEM UNAVAILABLE - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - RCIC UNAVAILABLE LONG TERM - HPCI UNAVAILABLE LONG TERM - VESSEL INJECTION WITH CRDHS UNAVAILABLE - FAILURE TO RECOVER 480V RMOV BDS 2A OR 2B - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - U1 TO U2 RHR CROSS CONNECT UNAVAILABLE - RHR PUMP B UNAVAILABLE - TORUS COOLING HARDWARE UNAVAILABLE - FAILURE TO RECOVER TORUS COOLING - OPERATOR FAILS TO ESTABLISH SHUTDOWN COOLING			
34	LOSS OF UNIT 2 120V PREFERRED POWER - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - HPCI UNAVAILABLE (6 HOURS) - RPV DEPRESSURIZATION - VESSEL INJECTION WITH CRDHS UNAVAILABLE		- 120 V AC UNIT 2 PREFERRED POWER UNAVAILABLE - MAIN CONDENSER UNAVAILABLE - RFW HARDWARE UNAVAILABLE - RCIC UNAVAILABLE (6 HOURS) - OPERATOR FAILS TO DEPRESSURIZE USING TBV'S	MIAV	1.83E-08	.34
35	TURBINE TRIP - UNIT 3 NOT AT POWER - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN		- VESSEL INJECTION WITH CRDHS UNAVAILABLE	OIAV	1.78E-08	.33

Figure B-1 (Page 9 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

MODEL Name: BFNU2M — Top-Ranking Sequences Contributing to Group : ALL Frequency — 07:56:48 09 MAY 1996
ALL = ALL DAMAGE STATES EXCEPT SUCCESS

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
	- OPERATOR FAILS TO CONTROL LPI DURING ATWS				
36	PARTIAL LOSS OF FEEDWATER - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - OPERATOR FAILS TO START SLC	- RPV DEPRESSURIZATION	MKCV	1.75E-08	.33
37	LOSS OF CONDENSER VACUUM - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN - OPERATOR FAILS TO CONTROL LPI DURING ATWS	- MAIN CONDENSER UNAVAILABLE - RFW HARDWARE UNAVAILABLE - VESSEL INJECTION WITH CRDHS UNAVAILABLE	OIAV	1.70E-08	.32
38	TURBINE TRIP - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - OPERATOR FAILS TO INHIBIT ADS	- VESSEL INJECTION WITH CRDHS UNAVAILABLE	MIAV	1.67E-08	.31
39	PARTIAL LOSS OF FEEDWATER - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - STANDBY LIQUID CONTROL SYSTEM UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN		MIAV	1.65E-08	.31
40	TOTAL LOSS OF FEEDWATER - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - STANDBY LIQUID CONTROL SYSTEM UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN	- RFW HARDWARE UNAVAILABLE	OIAV	1.61E-08	.30
41	TOTAL LOSS OF FEEDWATER - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE	- RFW HARDWARE UNAVAILABLE - OPERATOR FAILS TO ESTABLISH TORUS COOLING	MIBV	1.56E-08	.29
42	CLOSURE OF ALL MSIVS - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE	- MSIVS FAIL TO REMAIN OPEN - OPERATOR FAILS TO COOLDOWN USING THE TBVS - OPERATOR FAILS TO ESTABLISH TORUS COOLING	MIBV	1.53E-08	.28
43	LOSS OF CONDENSER VACUUM - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - OPERATOR FAILS TO START SLC	- MAIN CONDENSER UNAVAILABLE - RPV DEPRESSURIZATION	MKCV	1.51E-08	.28
44	TOTAL LOSS OF OFFSITE POWER - DG D UNAVAILABLE - DG C UNAVAILABLE - FAILURE TO RECOVER OFFSITE POWER IN 30 MINUTES - DG JA UNAVAILABILITY - DG JD UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - FAILURE TO RECOVER ELECTRIC POWER IN 6 HOURS	- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - 4KV SD BD C UNAVAILABLE - 480V SHUTDOWN BOARD 1B - 480V RMOV BD 1B POWER UNAVAILABLE - 4KV SD BD D UNAVAILABLE - 480V SHUTDOWN BOARD 2B - 480V RMOV BD 2B POWER UNAVAILABLE - 480V RMOV BD 2C POWER UNAVAILABLE - 480V DIESEL AUX BD B POWER UNAVAILABLE	PIGX	1.47E-08	.27

Figure B-1 (Page 10 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

Rank No.	Sequence Description	Events	Guaranteed Events/Comments	End State	Frequency (per year)	Percent
			- 120 V RPS BUS "B" UNAVAILABLE - 120 V I&C BUS "2B" UNAVAILABLE - 4KV UNIT BD 3A UNAVAILABLE - 4KV UNIT BD 3B UNAVAILABLE - 4KV SD BD 3EA AND 480V SD BD 3A POWER UNAVAILABLE - 480V SHUTDOWN BOARD 3A - 480V DIESEL AUX BD 3EA POWER UNAVAILABLE - 4KV SD BD 3ED UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - EECW PUMP A UNAVAILABLE - EECW PUMP B UNAVAILABLE - EECW PUMP D UNAVAILABLE - RX BUILDING COMPONENT COOLING WATER SYSTEM UNAVAILABLE - RHRSW PUMP B2 UNAVAILABLE - RHRSW PUMP D2 UNAVAILABLE - RHRSW PUMP D1 (SWING PUMP) UNAVAILABLE - PLANT CONTROL AIR SYSTEM UNAVAILABLE - DRYWELL CONTROL AIR SYSTEM UNAVAILABLE - OPERATOR FAILS TO RECOVER EECW (START SWING PUMP) - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - RCIC UNAVAILABLE LONG TERM - HPCI UNAVAILABLE LONG TERM - VESSEL INJECTION WITH CRDHS UNAVAILABLE - OPERATOR FAILS TO MANUALLY START RHR/CORE SPRAY - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - U1 TO U2 RHR CROSS CONNECT UNAVAILABLE - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE - U3 TO U2 RHR CROSS CONNECT UNAVAILABLE - OPERATOR FAILS TO ESTABLISH TORUS COOLING - RHR LOW PRESSURE INJECTION PATH UNAVAILABLE			
45	TOTAL LOSS OF OFFSITE POWER - 250 V DC CONTROL POWER FOR 4KV SD BD 3ED UNAVAILABLE - 250 V DC CONTROL POWER FOR 4KV SD BD 3EC AND 480V SD BD 3EB UNAVAILA- - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN		- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - 250 RMOV BD 2A UNAVAILABLE - 250 V RMOV BD 2B UNAVAILABLE - POWER SUPPLY DIVISION I UNAVAILABLE - POWER SUPPLY DIVISION II UNAVAILABLE - VESSEL LEVEL SIGNAL UNAVAILABLE - DIV I VESSEL LOW PRESSURE SIGNAL UNAVAILABLE - DIV II VESSEL LOW PRESSURE SIGNAL UNAVAILABLE - DIV I HI RX PRESS SIGNAL UNAVAILABLE - DIV II HI RX PRESS SIGNAL UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - RHRSW PUMP B1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP D1 (SWING PUMP) UNAVAILABLE - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - RCIC UNAVAILABLE (6 HOURS) - HPCI UNAVAILABLE (6 HOURS) - VESSEL INJECTION WITH CRDHS UNAVAILABLE - TORUS COOLING HARDWARE UNAVAILABLE - CS LOW PRESSURE INJECTION UNAVAILABLE - RHR LOW PRESSURE INJECTION PATH UNAVAILABLE	PIHV	1.46E-08	.27

Figure B-1 (Page 11 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

Rank No.	Sequence Description	Events	Guaranteed Events/Comments	End State	Frequency (per year)	Percent
46	TOTAL LOSS OF OFFSITE POWER - DG B UNAVAILABLE - DG C UNAVAILABLE - FAILURE TO RECOVER OFFSITE POWER IN 30 MINUTES - DG 3A UNAVAILABILITY - DG 3B UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - FAILURE TO RECOVER ELECTRIC POWER IN 6 HOURS		- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - 4KV SD BD B UNAVAILABLE - 480V SHUTDOWN BOARD 2A - 480V RMOV BD 2A POWER UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - 120 V RPS BUS "A" UNAVAILABLE - 4KV SD BD C UNAVAILABLE - 480V SHUTDOWN BOARD 1B - 480V RMOV BD 1B POWER UNAVAILABLE - 4KV UNIT BD 3A UNAVAILABLE - 4KV UNIT BD 3B UNAVAILABLE - 4KV SD BD 3EA AND 480V SD BD 3A POWER UNAVAILABLE - 480V SHUTDOWN BOARD 3A - 480V DIESEL AUX BD 3EA POWER UNAVAILABLE - 120 V I&C BUS "2A" UNAVAILABLE - 4KV SD BD 3EB UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - EECW PUMP A UNAVAILABLE - EECW PUMP B UNAVAILABLE - EECW PUMP C UNAVAILABLE - RX BUILDING COMPONENT COOLING WATER SYSTEM UNAVAILABLE - RHRSW PUMP B2 UNAVAILABLE - RHRSW PUMP C2 UNAVAILABLE - RHRSW PUMP C1 (SWING PUMP) UNAVAILABLE - PLANT CONTROL AIR SYSTEM UNAVAILABLE - DRYWELL CONTROL AIR SYSTEM UNAVAILABLE - OPERATOR FAILS TO RECOVER EECW (START SWING PUMP) - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - RCIC UNAVAILABLE LONG TERM - HPCI UNAVAILABLE LONG TERM - VESSEL INJECTION WITH CRDHS UNAVAILABLE - OPERATOR FAILS TO MANUALLY START RHR/CORE SPRAY - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - U1 TO U2 RHR CROSS CONNECT UNAVAILABLE - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE - U3 TO U2 RHR CROSS CONNECT UNAVAILABLE - OPERATOR FAILS TO ESTABLISH TORUS COOLING - RHR LOW PRESSURE INJECTION PATH UNAVAILABLE	PIGX	1.46E-08	.27
47	SCRAM REQUIRED (MANUAL SCRAMS) - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - OPERATOR FAILS TO START SLC		- RPV DEPRESSURIZATION	MKCV	1.45E-08	.27
48	TOTAL LOSS OF FEEDWATER - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - VESSEL INJECTION WITH CRDHS UNAVAILABLE - OPERATOR FAILS TO ESTABLISH TORUS COOLING		- RPH HARDWARE UNAVAILABLE	HLCV	1.45E-08	.27
49	TURBINE TRIP WITHOUT BYPASS - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS)		- TBVS FAIL TO RELIEVE\MAINTAIN RX PRESSURE - OPERATOR FAILS TO COOLDOWN USING THE TBVS - VESSEL INJECTION WITH CRDHS UNAVAILABLE	OIAV	1.43E-08	.27

Figure B-1 (Page 12 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

Rank No.	Sequence Description	Events / Guaranteed Events/Comments	End State	Frequency (per year)	Percent
	STATE - 1 RELIEF VALVE STUCK OPEN - OPERATOR FAILS TO CONTROL LPI DURING ATWS				
50	SCRAM REQUIRED (MANUAL SCRAMS) - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - STANDBY LIQUID CONTROL SYSTEM UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN		MIAV	1.40E-08	.26
51	TOTAL LOSS OF OFFSITE POWER - DG C UNAVAILABLE - FAILURE TO RECOVER OFFSITE POWER IN 30 MINUTES - DG 3A UNAVAILABILITY - DG 3B UNAVAILABLE - RHRSW PUMP C1 (SWING PUMP) UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - FAILURE TO RECOVER ELECTRIC POWER IN 6 HOURS	- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - 4KV SD BD C UNAVAILABLE - 480V SHUTDOWN BOARD 1B - 480V RMOV BD 1B POWER UNAVAILABLE - 4KV UNIT BD 3A UNAVAILABLE - 4KV UNIT BD 3B UNAVAILABLE - 4KV SD BD 3EA AND 480V SD BD 3A POWER UNAVAILABLE - 480V SHUTDOWN BOARD 3A - 480V DIESEL AUX BD 3EA POWER UNAVAILABLE - 4KV SD BD 3EB UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - EECW PUMP A UNAVAILABLE - EECW PUMP B UNAVAILABLE - EECW PUMP C UNAVAILABLE - RX BUILDING COMPONENT COOLING WATER SYSTEM UNAVAILABLE - RHRSW PUMP B2 UNAVAILABLE - PLANT CONTROL AIR SYSTEM UNAVAILABLE - DRYWELL CONTROL AIR SYSTEM UNAVAILABLE - OPERATOR FAILS TO RECOVER EECW (START SWING PUMP) - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - RCIC UNAVAILABLE LONG TERM - HPCI UNAVAILABLE LONG TERM - VESSEL INJECTION WITH CRDHS UNAVAILABLE - OPERATOR FAILS TO MANUALLY START RHR/CORE SPRAY - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - U1 TO U2 RHR CROSS CONNECT UNAVAILABLE - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE - U3 TO U2 RHR CROSS CONNECT UNAVAILABLE - OPERATOR FAILS TO ESTABLISH TORUS COOLING - RHR LOW PRESSURE INJECTION PATH UNAVAILABLE	PIGX	1.37E-08	.26
52	RECIRC DISCHARGE LINE BREAK - OPERATOR FAILS TO INITIATE SP COOLING	- CONTAINMENT VENT UNAVAILABLE	OLCV	1.34E-08	.25
53	TURBINE TRIP - UNIT 3 NOT AT POWER - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - OPERATOR FAILS TO START SLC	- RPV DEPRESSURIZATION	MKCV	1.33E-08	.25
54	PARTIAL LOSS OF CONDENSATE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RCIC UNAVAILABLE (6 HOURS)	- TBVS FAIL TO RELIEVE\MAINTAIN RX PRESSURE - RFW HARDWARE UNAVAILABLE - OPERATOR FAILS TO DEPRESSURIZE USING TBV'S	MIAV	1.30E-08	.24

Figure B-1 (Page 13 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
	- HPCI UNAVAILABLE (6 HOURS) - RPV DEPRESSURIZATION - VESSEL INJECTION WITH CRDHS UNAVAILABLE				
55	MEDIUM LOCA - OPERATOR FAILS TO INITIATE SP COOLING	- CONTAINMENT VENT UNAVAILABLE	OLCV	1.30E-08	.24
56	TURBINE TRIP - UNIT 3 NOT AT POWER - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - STANDBY LIQUID CONTROL SYSTEM UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN		MIAV	1.28E-08	.24
57	LOSS OF CONDENSER VACUUM - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - STANDBY LIQUID CONTROL SYSTEM UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN	- MAIN CONDENSER UNAVAILABLE - RFW HARDWARE UNAVAILABLE	OIAV	1.28E-08	.24
58	MEDIUM LOCA - HIGH PRESSURE COOLANT INJECTION SYSTEM UNAVAILABLE - FAILURE TO DEPRESSURIZE VIA THE SRVS	- CONTAINMENT VENT UNAVAILABLE	OIAV	1.27E-08	.24
59	LOSS OF RAW COOLING WATER - SUPPRESSION POOL (TORUS) UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN	- RAW COOLING WATER SYSTEM UNAVAILABLE - MAIN CONDENSER UNAVAILABLE - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - HPCI UNAVAILABLE (6 HOURS) - RCIC UNAVAILABLE LONG TERM - VESSEL INJECTION WITH CRDHS UNAVAILABLE - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE - U3 TO U2 RHR CROSS CONNECT UNAVAILABLE - OPERATOR FAILS TO ESTABLISH TORUS COOLING	PLFV	1.27E-08	.24
60	LOSS OF CONDENSER VACUUM - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE	- MAIN CONDENSER UNAVAILABLE - RFW HARDWARE UNAVAILABLE - OPERATOR FAILS TO ESTABLISH TORUS COOLING	MIBV	1.24E-08	.23
61	TURBINE TRIP WITHOUT BYPASS - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - STANDBY LIQUID CONTROL SYSTEM UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN	- TBVS FAIL TO RELIEVE\MAINTAIN RX PRESSURE	OIAV	1.22E-08	.23
62	TOTAL LOSS OF OFFSITE POWER - DG A UNAVAILABLE - DG D UNAVAILABLE - DG B UNAVAILABLE - DG C UNAVAILABLE - FAILURE TO RECOVER OFFSITE POWER IN 30 MINUTES - COMMON CAUSE COUPLING OF UNIT 1/2 AND UNIT 3 DIESELS - UNIT 3 NOT AT POWER - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - FAILURE TO RECOVER ELECTRIC POWER IN 6 HOURS	- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - 4KV SD BD A UNAVAILABLE - 480V SHUTDOWN BOARD 1A - 480V RMOV BD 1A POWER UNAVAILABLE - 480V DIESEL AUX. BD A POWER UNAVAILABLE - 4KV SD BD B UNAVAILABLE - 480V SHUTDOWN BOARD 2A - 480V RMOV BD 2A POWER UNAVAILABLE	PIGX	1.20E-08	.22

Figure B-1 (Page 14 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
		- 4KV UNIT BD 2C POWER UNAVAILABLE			
		- 120 V RPS BUS "A" UNAVAILABLE			
		- 4KV SD BD C UNAVAILABLE			
		- 480V SHUTDOWN BOARD 1B			
		- 480V RMOV BD 1B POWER UNAVAILABLE			
		- 4KV SD BD D UNAVAILABLE			
		- 480V SHUTDOWN BOARD 2B			
		- 480V RMOV BD 2D POWER UNAVAILABLE			
		- 480V RMOV BD 2E POWER UNAVAILABLE			
		- 480V RMOV BD 2B POWER UNAVAILABLE			
		- 480V RMOV BD 2C POWER UNAVAILABLE			
		- 480V DIESEL AUX BD B POWER UNAVAILABLE			
		- 120 V RPS BUS "B" UNAVAILABLE			
		- 120 V I&C BUS "2B" UNAVAILABLE			
		- 4KV UNIT BD 3A UNAVAILABLE			
		- 4KV UNIT BD 3B UNAVAILABLE			
		- DG 3A UNAVAILABILITY			
		- 4KV SD BD 3EA AND 480V SD BD 3A POWER UNAVAILABLE			
		- 480V SHUTDOWN BOARD 3A			
		- 480V DIESEL AUX BD 3EA POWER UNAVAILABLE			
		- 120 V I&C BUS "2A" UNAVAILABLE			
		- DG 3C UNAVAILABLE			
		- 4KV SD BD 3EC AND 480V SD BD 3B UNAVAILABLE			
		- DG 3B UNAVAILABLE			
		- 4KV SD BD 3EB UNAVAILABLE			
		- 480V SHUTDOWN BOARD 3B			
		- 480V DIESEL AUX BD 3EB POWER UNAVAILABLE			
		- DG 3D UNAVAILABLE			
		- 4KV SD BD 3ED UNAVAILABLE			
		- RAW COOLING WATER SYSTEM UNAVAILABLE			
		- EECW PUMP A UNAVAILABLE			
		- EECW PUMP B UNAVAILABLE			
		- EECW PUMP C UNAVAILABLE			
		- EECW PUMP D UNAVAILABLE			
		- RX BUILDING COMPONENT COOLING WATER SYSTEM UNAVAILABLE			
		- RHRSW PUMP A2 UNAVAILABLE			
		- RHRSW PUMP A1 (SWING PUMP) UNAVAILABLE			
		- RHRSW PUMP B2 UNAVAILABLE			
		- RHRSW PUMP B1 (SWING PUMP) UNAVAILABLE			
		- RHRSW PUMP C2 UNAVAILABLE			
		- RHRSW PUMP C1 (SWING PUMP) UNAVAILABLE			
		- RHRSW PUMP D2 UNAVAILABLE			
		- RHRSW PUMP D1 (SWING PUMP) UNAVAILABLE			
		- PLANT CONTROL AIR SYSTEM UNAVAILABLE			
		- DRYWELL CONTROL AIR SYSTEM UNAVAILABLE			
		- CONTAINMENT ATMOSPHERIC DILUTION			
		- OPERATOR FAILS TO RECOVER EECW (START SWING PUMP)			
		- MSIVS FAIL TO REMAIN OPEN			
		- 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL			
		- RCIC UNAVAILABLE LONG TERM			
		- HPCI UNAVAILABLE LONG TERM			
		- VESSEL INJECTION WITH CRDHS UNAVAILABLE			
		- OPERATOR FAILS TO MANUALLY START RHR/CORE SPRAY			
		- FAILURE TO RECOVER 480V RMOV BDS 2A OR 2B			
		- RHR PUMP A UNAVAILABLE			
		- RHR PUMP C UNAVAILABLE			
		- U1 TO U2 RHR CROSS CONNECT UNAVAILABLE			
		- RHR PUMP B UNAVAILABLE			
		- RHR PUMP D UNAVAILABLE			
		- U3 TO U2 RHR CROSS CONNECT UNAVAILABLE			
		- OPERATOR FAILS TO ESTABLISH TORUS COOLING			
		- RHR LOW PRESSURE INJECTION PATH UNAVAILABLE			
63	TOTAL LOSS OF FEEDWATER	- RFW HARDWARE UNAVAILABLE	MIBV	1.19E-08	.22

Figure B-1 (Page 15 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

Rank No.	Sequence Description	Events	Guaranteed Events/Comments	End State	Frequency (per year)	Percent
	- AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE		- OPERATOR FAILS TO ESTABLISH TORUS COOLING			
64	TOTAL LOSS OF OFFSITE POWER - DG D UNAVAILABLE - DG C UNAVAILABLE - FAILURE TO RECOVER OFFSITE POWER IN 30 MINUTES - DG 3A UNAVAILABILITY - RHRSW PUMP D1 (SWING PUMP) UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - FAILURE TO RECOVER ELECTRIC POWER IN 6 HOURS		- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - 4KV SD BD C UNAVAILABLE - 480V SHUTDOWN BOARD 1B - 480V RMOV BD 1B POWER UNAVAILABLE - 4KV SD BD D UNAVAILABLE - 480V SHUTDOWN BOARD 2B - 480V RMOV BD 2B POWER UNAVAILABLE - 480V RMOV BD 2C POWER UNAVAILABLE - 480V DIESEL AUX BD B POWER UNAVAILABLE - 120 V RPS BUS "B" UNAVAILABLE - 120 V I&C BUS "2B" UNAVAILABLE - 4KV UNIT BD 3A UNAVAILABLE - 4KV UNIT BD 3B UNAVAILABLE - 4KV SD BD 3EA AND 480V SD BD 3A POWER UNAVAILABLE - 480V SHUTDOWN BOARD 3A - 480V DIESEL AUX BD 3EA POWER UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - EECW PUMP A UNAVAILABLE - EECW PUMP B UNAVAILABLE - EECW PUMP D UNAVAILABLE - RX BUILDING COMPONENT COOLING WATER SYSTEM UNAVAILABLE - RHRSW PUMP B2 UNAVAILABLE - PLANT CONTROL AIR SYSTEM UNAVAILABLE - DRYWELL CONTROL AIR SYSTEM UNAVAILABLE - OPERATOR FAILS TO RECOVER EECW (START SWING PUMP) - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - RCIC UNAVAILABLE LONG TERM - HPCI UNAVAILABLE LONG TERM - VESSEL INJECTION WITH CRDHS UNAVAILABLE - OPERATOR FAILS TO MANUALLY START RHR/CORE SPRAY - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - U1 TO U2 RHR CROSS CONNECT UNAVAILABLE - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE - U3 TO U2 RHR CROSS CONNECT UNAVAILABLE - OPERATOR FAILS TO ESTABLISH TORUS COOLING - RHR LOW PRESSURE INJECTION PATH UNAVAILABLE	PIGX	1.16E-08	.22
65	TURBINE TRIP - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN - OPERATOR FAILS TO CONTROL LPI DURING ATWS		- VESSEL INJECTION WITH CRDHS UNAVAILABLE	OIAZ	1.14E-08	.21
66	LOSS OF RBCCW - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - OPERATOR FAILS TO START SLC		- RX BUILDING COMPONENT COOLING WATER SYSTEM UNAVAILABLE - DRYWELL CONTROL AIR SYSTEM UNAVAILABLE - MSIVS FAIL TO REMAIN OPEN	MKCV	1.12E-08	.21

Figure B-1 (Page 16 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
		- RPV DEPRESSURIZATION			
67	LOSS OF RAW COOLING WATER - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN - OPERATOR FAILS TO START CS/LPCI OR TO ESTAB TORUS VENT	- RAW COOLING WATER SYSTEM UNAVAILABLE - MAIN CONDENSER UNAVAILABLE - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - VESSEL INJECTION WITH CRDHS UNAVAILABLE	OIAV	1.08E-08	.20
68	LOSS OF RAW COOLING WATER - UNIT 3 NOT AT POWER - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RCIC UNAVAILABLE (6 HOURS) - HPCI UNAVAILABLE (6 HOURS) - RPV DEPRESSURIZATION	- RAW COOLING WATER SYSTEM UNAVAILABLE - MAIN CONDENSER UNAVAILABLE - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - VESSEL INJECTION WITH CRDHS UNAVAILABLE	MIAV	1.05E-08	.20
69	LOSS OF RAW COOLING WATER - DIV I VESSEL LOW PRESSURE SIGNAL UNAVAILABLE - DIV II VESSEL LOW PRESSURE SIGNAL UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN	- RAW COOLING WATER SYSTEM UNAVAILABLE - MAIN CONDENSER UNAVAILABLE - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - VESSEL INJECTION WITH CRDHS UNAVAILABLE - CS LOW PRESSURE INJECTION UNAVAILABLE - RHR LOW PRESSURE INJECTION PATH UNAVAILABLE	OIAV	1.05E-08	.20
70	TURBINE TRIP WITHOUT BYPASS - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE	- TBVS FAIL TO RELIEVE\MAINTAIN RX PRESSURE - OPERATOR FAILS TO COOLDOWN USING THE TBVS - OPERATOR FAILS TO ESTABLISH TORUS COOLING	MIBV	1.04E-08	.19
71	TOTAL LOSS OF OFFSITE POWER - DG A UNAVAILABLE - DG B UNAVAILABLE - DG C UNAVAILABLE - FAILURE TO RECOVER OFFSITE POWER IN 30 MINUTES - RHRSW PUMP B1 (SWING PUMP) UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - FAILURE TO RECOVER ELECTRIC POWER IN 6 HOURS	- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - 4KV SD BD A UNAVAILABLE - 480V SHUTDOWN BOARD 1A - 480V RMOV BD 1A POWER UNAVAILABLE - 480V DIESEL AUX. BD A POWER UNAVAILABLE - 4KV SD BD B UNAVAILABLE - 480V SHUTDOWN BOARD 2A - 480V RMOV BD 2A POWER UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - 120 V RPS BUS "A" UNAVAILABLE - 4KV SD BD C UNAVAILABLE - 480V SHUTDOWN BOARD 1B - 480V RMOV BD 1B POWER UNAVAILABLE - 4KV UNIT BD 3A UNAVAILABLE - 4KV UNIT BD 3B UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - EECW PUMP B UNAVAILABLE - RHRSW PUMP A2 UNAVAILABLE - RHRSW PUMP A1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP B2 UNAVAILABLE - RHRSW PUMP C2 UNAVAILABLE - RHRSW PUMP C1 (SWING PUMP) UNAVAILABLE - PLANT CONTROL AIR SYSTEM UNAVAILABLE - DRYWELL CONTROL AIR SYSTEM UNAVAILABLE - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - RCIC UNAVAILABLE LONG TERM	PLFV	1.01E-08	.19

Figure B-1 (Page 17 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

MODEL Name: BFNU2M — Top-Ranking Sequences Contributing to Group : ALL Frequency — 07:56:48 09 MAY 1996
ALL = ALL DAMAGE STATES EXCEPT SUCCESS

Rank No.	Sequence Description	Events — Guaranteed Events/Comments	End State	Frequency (per year)	Percent
		- HPCI UNAVAILABLE LONG TERM - VESSEL INJECTION WITH CRDHS UNAVAILABLE - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - U1 TO U2 RHR CROSS CONNECT UNAVAILABLE - RHR PUMP B UNAVAILABLE - TORUS COOLING HARDWARE UNAVAILABLE - FAILURE TO RECOVER TORUS COOLING - OPERATOR FAILS TO ESTABLISH SHUTDOWN COOLING			
72	TOTAL LOSS OF OFFSITE POWER - FUEL OIL SYSTEM FOR DIESEL A UNAVAILABLE - FUEL OIL FOR DIESEL D UNAVAILABLE - FUEL OIL SYSTEM FOR DIESEL B UNAVAILABLE - FUEL OIL SYSTEM FOR DIESEL C UNAVAILABLE - FAILURE TO RECOVER OFFSITE POWER IN 30 MINUTES - COMMON CAUSE COUPLING OF UNIT 1/2 AND UNIT 3 DIESELS - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - FAILURE TO RECOVER ELECTRIC POWER IN 6 HOURS	- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - DG A UNAVAILABLE - DG D UNAVAILABLE - DG B UNAVAILABLE - DG C UNAVAILABLE - 4KV SD BD A UNAVAILABLE - 480V SHUTDOWN BOARD 1A - 480V RMOV BD 1A POWER UNAVAILABLE - 480V DIESEL AUX. BD A POWER UNAVAILABLE - 4KV SD BD B UNAVAILABLE - 480V SHUTDOWN BOARD 2A - 480V RMOV BD 2A POWER UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - 120 V RPS BUS "A" UNAVAILABLE - 4KV SD BD C UNAVAILABLE - 480V SHUTDOWN BOARD 1B - 480V RMOV BD 1B POWER UNAVAILABLE - 4KV SD BD D UNAVAILABLE - 480V SHUTDOWN BOARD 2B - 480V RMOV BD 2D POWER UNAVAILABLE - 480V RMOV BD 2E POWER UNAVAILABLE - 480V RMOV BD 2B POWER UNAVAILABLE - 480V RMOV BD 2C POWER UNAVAILABLE - 480V DIESEL AUX BD B POWER UNAVAILABLE - 120 V RPS BUS "B" UNAVAILABLE - 120 V I&C BUS "2B" UNAVAILABLE - 4KV UNIT BD 3A UNAVAILABLE - 4KV UNIT BD 3B UNAVAILABLE - FUEL OIL SYSTEM FOR DIESEL 3A UNAVAILABLE - DG 3A UNAVAILABILITY - 4KV SD BD 3EA AND 480V SD BD 3A POWER UNAVAILABLE - 480V SHUTDOWN BOARD 3A - 480V DIESEL AUX BD 3EA POWER UNAVAILABLE - 120 V I&C BUS "2A" UNAVAILABLE - FUEL OIL SYSTEM FOR DIESEL 3C UNAVAILABLE - DG 3C UNAVAILABLE - 4KV SD BD 3EC AND 480V SD BD 3B UNAVAILABLE - FUEL OIL SYSTEM FOR DIESEL 3B UNAVAILABLE - DG 3B UNAVAILABLE - 4KV SD BD 3EB UNAVAILABLE - 480V SHUTDOWN BOARD 3B - 480V DIESEL AUX BD 3EB POWER UNAVAILABLE - FUEL OIL FOR DIESEL 3D UNAVAILABLE - DG 3D UNAVAILABLE - 4KV SD BD 3ED UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE	PIGX	1.01E-08	.19

Figure B-1 (Page 18 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

MODEL Name: BFNU2M — Top-Ranking Sequences Contributing to Group : ALL Frequency — 07:56:48 09 MAY 1996
ALL = ALL DAMAGE STATES EXCEPT SUCCESS

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
		- EECW PUMP A UNAVAILABLE - EECW PUMP B UNAVAILABLE - EECW PUMP C UNAVAILABLE - EECW PUMP D UNAVAILABLE - RX BUILDING COMPONENT COOLING WATER SYSTEM UNAVAILABLE - RHRSW PUMP A2 UNAVAILABLE - RHRSW PUMP A1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP B2 UNAVAILABLE - RHRSW PUMP B1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP C2 UNAVAILABLE - RHRSW PUMP C1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP D2 UNAVAILABLE - RHRSW PUMP D1 (SWING PUMP) UNAVAILABLE - PLANT CONTROL AIR SYSTEM UNAVAILABLE - DRYWELL CONTROL AIR SYSTEM UNAVAILABLE - CONTAINMENT ATMOSPHERIC DILUTION - OPERATOR FAILS TO RECOVER EECW (START SWING PUMP) - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - RCIC UNAVAILABLE LONG TERM - HPCI UNAVAILABLE LONG TERM - VESSEL INJECTION WITH CRDHS UNAVAILABLE - OPERATOR FAILS TO MANUALLY START RHR/CORE SPRAY - FAILURE TO RECOVER 480V RMOV BDS 2A OR 2B - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - U1 TO U2 RHR CROSS CONNECT UNAVAILABLE - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE - U3 TO U2 RHR CROSS CONNECT UNAVAILABLE - OPERATOR FAILS TO ESTABLISH TORUS COOLING - RHR LOW PRESSURE INJECTION PATH UNAVAILABLE			
73	LOSS OF RBCCW - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RCIC UNAVAILABLE (6 HOURS) - HPCI UNAVAILABLE (6 HOURS) - RPV DEPRESSURIZATION - VESSEL INJECTION WITH CRDHS UNAVAILABLE	- RX BUILDING COMPONENT COOLING WATER SYSTEM UNAVAILABLE - DRYWELL CONTROL AIR SYSTEM UNAVAILABLE - MSIVS FAIL TO REMAIN OPEN - RPW HARDWARE UNAVAILABLE - OPERATOR FAILS TO INHIBIT CLOSURE OF MSIVS ON LEVEL	MIAV	9.89E-09	.18
74	CLOSURE OF ALL MSIVS - UNIT 3 NOT AT POWER - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - OPERATOR FAILS TO START SLC	- MSIVS FAIL TO REMAIN OPEN - RPV DEPRESSURIZATION	MXCV	9.66E-09	.18
75	CLOSURE OF ALL MSIVS - 250 V DC CONTROL POWER FOR 4KV SD BD 3ED UNAVAILABLE - 250 V DC CONTROL POWER FOR 4KV SD BD 3EC AND 480V SD BD 3EB UNAVAILA- - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - U1 TO U2 RHR CROSS CONNECT UNAVAILABLE	- 250 RMOV BD 2A UNAVAILABLE - 250 V RMOV BD 2B UNAVAILABLE - POWER SUPPLY DIVISION I UNAVAILABLE - POWER SUPPLY DIVISION II UNAVAILABLE - VESSEL LEVEL SIGNAL UNAVAILABLE - DIV I VESSEL LOW PRESSURE SIGNAL UNAVAILABLE - DIV II VESSEL LOW PRESSURE SIGNAL UNAVAILABLE - DIV I HI RX PRESS SIGNAL UNAVAILABLE - DIV II HI RX PRESS SIGNAL UNAVAILABLE - MSIVS FAIL TO REMAIN OPEN - RPW HARDWARE UNAVAILABLE - RCIC UNAVAILABLE (6 HOURS) - HPCI UNAVAILABLE (6 HOURS) - OPERATOR FAILS TO INHIBIT CLOSURE OF MSIVS ON LEVEL - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE	PIFV	9.60E-09	.18

Figure B-1 (Page 19 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

MODEL Name: BFNU2M — Top-Ranking Sequences Contributing to Group : ALL Frequency — 07:56:48 09 MAY 1996
ALL = ALL DAMAGE STATES EXCEPT SUCCESS

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
		- TORUS COOLING HARDWARE UNAVAILABLE - FAILURE TO RECOVER TORUS COOLING - RHR LOW PRESSURE INJECTION PATH UNAVAILABLE - OPERATOR FAILS TO START CS/LPCI OR TO ESTAB TORUS VENT			
76	LOSS OF CONDENSER VACUUM - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE	- MAIN CONDENSER UNAVAILABLE - RFW HARDWARE UNAVAILABLE - OPERATOR FAILS TO ESTABLISH TORUS COOLING	MIBV	9.47E-09	.18
77	CORE SPRAY LINE BREAK - ONE CORE SPRAY LOOP FAILS TO INJECT - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE	- CROSS CONNECT TO UNIT 3 RHR SYSTEM UNAVAILABLE - RHR LPCI INJECTION PATH UNAVAILABLE - CONTAINMENT VENT UNAVAILABLE	OIAV	9.18E-09	.17
78	CORE SPRAY LINE BREAK - ONE CORE SPRAY LOOP FAILS TO INJECT - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE	- CROSS CONNECT TO UNIT 1 RHR SYSTEM UNAVAILABLE - RHR LPCI INJECTION PATH UNAVAILABLE - CONTAINMENT VENT UNAVAILABLE	OIAV	9.18E-09	.17
79	TURBINE TRIP - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 2 RELIEF VALVES STUCK OPEN - OPERATOR FAILS TO CONTROL LPI DURING ATWS	- VESSEL INJECTION WITH CRDHS UNAVAILABLE	OIAV	9.14E-09	.17
80	FEEDWATER RAMPUP - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN - OPERATOR FAILS TO CONTROL LPI DURING ATWS	- INITIATOR IS BOC, FWRU, PRFOPEN - INITIATOR IS FWRU - RFW HARDWARE UNAVAILABLE - VESSEL INJECTION WITH CRDHS UNAVAILABLE	OIAV	8.87E-09	.17
81	CLOSURE OF ALL MSIVS - UNIT 3 NOT AT POWER - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RCIC UNAVAILABLE (6 HOURS) - HPCI UNAVAILABLE (6 HOURS) - RPV DEPRESSURIZATION - VESSEL INJECTION WITH CRDHS UNAVAILABLE	- MSIVS FAIL TO REMAIN OPEN - RFW HARDWARE UNAVAILABLE - OPERATOR FAILS TO INHIBIT CLOSURE OF MSIVS ON LEVEL	MIAV	8.54E-09	.16
82	LOSS OF RAW COOLING WATER - 250 V DC CONTROL POWER FOR 4KV SD BD 3EC AND 480V SD BD 3EB UNAVAILA - POWER SUPPLY DIVISION II UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN	- 250 V RMOV BD 2B UNAVAILABLE - POWER SUPPLY DIVISION I UNAVAILABLE - VESSEL LEVEL SIGNAL UNAVAILABLE - DIV I VESSEL LOW PRESSURE SIGNAL UNAVAILABLE - DIV II VESSEL LOW PRESSURE SIGNAL UNAVAILABLE - DIV I HI RX PRESS SIGNAL UNAVAILABLE - DIV II HI RX PRESS SIGNAL UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - RHRSW PUMP B1 (SWING PUMP) UNAVAILABLE - MAIN CONDENSER UNAVAILABLE - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - RCIC UNAVAILABLE (6 HOURS) - HPCI UNAVAILABLE (6 HOURS) - VESSEL INJECTION WITH CRDHS UNAVAILABLE - RHR PUMP A UNAVAILABLE - CS LOW PRESSURE INJECTION UNAVAILABLE - RHR LOW PRESSURE INJECTION PATH UNAVAILABLE	PIHV	8.53E-09	.16
83	TURBINE TRIP - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - OPERATOR FAILS TO START SLC	- RPV DEPRESSURIZATION	MKCZ	8.51E-09	.16

Figure B-1 (Page 20 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

MODEL Name: BFNU2M — Top-Ranking Sequences Contributing to Group : ALL Frequency — 07:56:48 09 MAY 1996
ALL = ALL DAMAGE STATES EXCEPT SUCCESS

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
84	TOTAL LOSS OF OFFSITE POWER - UNIT 3 NOT AT POWER - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RCIC UNAVAILABLE (6 HOURS) - HPCI UNAVAILABLE (6 HOURS) - RPV DEPRESSURIZATION	- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - VESSEL INJECTION WITH CRDHS UNAVAILABLE	MIAV	8.23E-09	.15
85	TURBINE TRIP - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - STANDBY LIQUID CONTROL SYSTEM UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN		MIAZ	8.20E-09	.15
86	TURBINE TRIP WITHOUT BYPASS - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE	- TBVS FAIL TO RELIEVE\MAINTAIN RX PRESSURE - OPERATOR FAILS TO COOLDOWN USING THE TBVS - OPERATOR FAILS TO ESTABLISH TORUS COOLING	MIBV	7.96E-09	.15
87	LOSS OF RAW COOLING WATER - UNIT 3 NOT AT POWER - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN - OPERATOR FAILS TO ESTABLISH TORUS COOLING	- RAW COOLING WATER SYSTEM UNAVAILABLE - MAIN CONDENSER UNAVAILABLE - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - VESSEL INJECTION WITH CRDHS UNAVAILABLE	OLCV	7.94E-09	.15
88	FEEDWATER RAMPUP - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - OPERATOR FAILS TO START SLC	- INITIATOR IS BOC, FWRU, PRFOPEN - INITIATOR IS FWRU - RPV DEPRESSURIZATION	MKCV	7.87E-09	.15
89	CLOSURE OF ALL MSIVS - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 3 OR MORE VALVES STUCK OPEN - OPERATOR FAILS TO ESTABLISH TORUS COOLING	- MSIVS FAIL TO REMAIN OPEN - OPERATOR FAILS TO ESTABLISH SHUTDOWN COOLING	OLCV	7.87E-09	.15
90	FLOOD FROM THE TORUS - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN - RFW HARDWARE UNAVAILABLE	- SUPPRESSION POOL (TORUS) UNAVAILABLE - RCIC UNAVAILABLE (6 HOURS) - HPCI UNAVAILABLE (6 HOURS) - OPERATOR FAILS TO MANUALLY START RHR/CORE SPRAY - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE - OPERATOR FAILS TO ESTABLISH TORUS COOLING - OPERATOR FAILS TO ESTABLISH SHUTDOWN COOLING - OPERATOR FAILS TO START CS/LPCI OR TO ESTAB TORUS VENT	PJAV	7.74E-09	.14
91	TOTAL LOSS OF OFFSITE POWER - DG A UNAVAILABLE - DG D UNAVAILABLE - DG B UNAVAILABLE - DG C UNAVAILABLE - FAILURE TO RECOVER OFFSITE POWER IN 30 MINUTES - RHRSW PUMP B1 (SWING PUMP) UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS)	- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE	PLFX	7.73E-09	.14

Figure B-1 (Page 21 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
	STATE - 0 RELIEF VALVES STUCK OPEN - FAILURE TO RECOVER ELECTRIC POWER IN 6 HOURS	- SHUTDOWN BUS 2 UNAVAILABLE - 4KV SD BD A UNAVAILABLE - 480V SHUTDOWN BOARD 1A - 480V RMOV BD 1A POWER UNAVAILABLE - 480V DIESEL AUX. BD A POWER UNAVAILABLE - 4KV SD BD B UNAVAILABLE - 480V SHUTDOWN BOARD 2A - 480V RMOV BD 2A POWER UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - 120 V RPS BUS "A" UNAVAILABLE - 4KV SD BD C UNAVAILABLE - 480V SHUTDOWN BOARD 1B - 480V RMOV BD 1B POWER UNAVAILABLE - 4KV SD BD D UNAVAILABLE - 480V SHUTDOWN BOARD 2B - 480V RMOV BD 2D POWER UNAVAILABLE - 480V RMOV BD 2E POWER UNAVAILABLE - 480V RMOV BD 2B POWER UNAVAILABLE - 480V RMOV BD 2C POWER UNAVAILABLE - 480V DIESEL AUX BD B POWER UNAVAILABLE - 120 V RPS BUS "B" UNAVAILABLE - 120 V I&C BUS "2B" UNAVAILABLE - 4KV UNIT BD 3A UNAVAILABLE - 4KV UNIT BD 3B UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - EECW PUMP B UNAVAILABLE - RX BUILDING COMPONENT COOLING WATER SYSTEM UNAVAILABLE - RHRSW PUMP A2 UNAVAILABLE - RHRSW PUMP A1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP B2 UNAVAILABLE - RHRSW PUMP C2 UNAVAILABLE - RHRSW PUMP C1 (SWING PUMP) UNAVAILABLE - PLANT CONTROL AIR SYSTEM UNAVAILABLE - DRYWELL CONTROL AIR SYSTEM UNAVAILABLE - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - RCIC UNAVAILABLE LONG TERM - HPCI UNAVAILABLE LONG TERM - VESSEL INJECTION WITH CRDHS UNAVAILABLE - FAILURE TO RECOVER 480V RMOV BDS 2A OR 2B - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - U1 TO U2 RHR CROSS CONNECT UNAVAILABLE - RHR PUMP B UNAVAILABLE - TORUS COOLING HARDWARE UNAVAILABLE - FAILURE TO RECOVER TORUS COOLING - OPERATOR FAILS TO ESTABLISH SHUTDOWN COOLING			
92	TOTAL LOSS OF OFFSITE POWER - DG A UNAVAILABLE - DG D UNAVAILABLE - DG B UNAVAILABLE - DG C UNAVAILABLE - FAILURE TO RECOVER OFFSITE POWER IN 30 MINUTES - COMMON CAUSE COUPLING OF UNIT 1/2 AND UNIT 3 DIESELS - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - FAILURE TO RECOVER ELECTRIC POWER IN 6 HOURS	- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - 4KV SD BD A UNAVAILABLE - 480V SHUTDOWN BOARD 1A - 480V RMOV BD 1A POWER UNAVAILABLE - 480V DIESEL AUX. BD A POWER UNAVAILABLE - 4KV SD BD B UNAVAILABLE - 480V SHUTDOWN BOARD 2A - 480V RMOV BD 2A POWER UNAVAILABLE	PIGZ	7.71E-09	.14

Figure B-1 (Page 22 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

MODEL Name: BFNU2M — Top-Ranking Sequences Contributing to Group : ALL Frequency — 07:56:48 09 MAY 1996
ALL = ALL DAMAGE STATES EXCEPT SUCCESS

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
		- 4KV UNIT BD 2C POWER UNAVAILABLE			
		- 120 V RPS BUS "A" UNAVAILABLE			
		- 4KV SD BD C UNAVAILABLE			
		- 480V SHUTDOWN BOARD 1B			
		- 480V RMOV BD 1B POWER UNAVAILABLE			
		- 4KV SD BD D UNAVAILABLE			
		- 480V SHUTDOWN BOARD 2B			
		- 480V RMOV BD 2D POWER UNAVAILABLE			
		- 480V RMOV BD 2E POWER UNAVAILABLE			
		- 480V RMOV BD 2B POWER UNAVAILABLE			
		- 480V RMOV BD 2C POWER UNAVAILABLE			
		- 480V DIESEL AUX BD B POWER UNAVAILABLE			
		- 120 V RPS BUS "B" UNAVAILABLE			
		- 120 V I&C BUS "2B" UNAVAILABLE			
		- 4KV UNIT BD 3A UNAVAILABLE			
		- 4KV UNIT BD 3B UNAVAILABLE			
		- DG 3A UNAVAILABILITY			
		- 4KV SD BD 3EA AND 480V SD BD 3A POWER UNAVAILABLE			
		- 480V SHUTDOWN BOARD 3A			
		- 480V DIESEL AUX BD 3EA POWER UNAVAILABLE			
		- 120 V I&C BUS "2A" UNAVAILABLE			
		- DG 3C UNAVAILABLE			
		- 4KV SD BD 3EC AND 480V SD BD 3B UNAVAILABLE			
		- DG 3B UNAVAILABLE			
		- 4KV SD BD 3EB UNAVAILABLE			
		- 480V SHUTDOWN BOARD 3B			
		- 480V DIESEL AUX BD 3EB POWER UNAVAILABLE			
		- DG 3D UNAVAILABLE			
		- 4KV SD BD 3ED UNAVAILABLE			
		- RAW COOLING WATER SYSTEM UNAVAILABLE			
		- EECW PUMP A UNAVAILABLE			
		- EECW PUMP B UNAVAILABLE			
		- EECW PUMP C UNAVAILABLE			
		- EECW PUMP D UNAVAILABLE			
		- RX BUILDING COMPONENT COOLING WATER SYSTEM UNAVAILABLE			
		- RHRSW PUMP A2 UNAVAILABLE			
		- RHRSW PUMP A1 (SWING PUMP) UNAVAILABLE			
		- RHRSW PUMP B2 UNAVAILABLE			
		- RHRSW PUMP B1 (SWING PUMP) UNAVAILABLE			
		- RHRSW PUMP C2 UNAVAILABLE			
		- RHRSW PUMP C1 (SWING PUMP) UNAVAILABLE			
		- RHRSW PUMP D2 UNAVAILABLE			
		- RHRSW PUMP D1 (SWING PUMP) UNAVAILABLE			
		- PLANT CONTROL AIR SYSTEM UNAVAILABLE			
		- DRYWELL CONTROL AIR SYSTEM UNAVAILABLE			
		- CONTAINMENT ATMOSPHERIC DILUTION			
		- OPERATOR FAILS TO RECOVER EECW (START SWING PUMP)			
		- MSIVS FAIL TO REMAIN OPEN			
		- 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL			
		- RCIC UNAVAILABLE LONG TERM			
		- HPCI UNAVAILABLE LONG TERM			
		- VESSEL INJECTION WITH CRDHS UNAVAILABLE			
		- OPERATOR FAILS TO MANUALLY START RHR/CORE SPRAY			
		- FAILURE TO RECOVER 480V RMOV BDS 2A OR 2B			
		- RHR PUMP A UNAVAILABLE			
		- RHR PUMP C UNAVAILABLE			
		- U1 TO U2 RHR CROSS CONNECT UNAVAILABLE			
		- RHR PUMP B UNAVAILABLE			
		- RHR PUMP D UNAVAILABLE			
		- U3 TO U2 RHR CROSS CONNECT UNAVAILABLE			
		- OPERATOR FAILS TO ESTABLISH TORUS COOLING			
		- RHR LOW PRESSURE INJECTION PATH UNAVAILABLE			
93	PARTIAL LOSS OF CONDENSATE	- TBVS FAIL TO RELIEVE\MAINTAIN RX PRESSURE	OIAV	7.44E-09	.14

Figure B-1 (Page 23 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

Rank No.	Sequence Description	Events	Guaranteed Events/Comments	End State	Frequency (per year)	Percent
	- AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN - OPERATOR FAILS TO CONTROL LPI DURING ATWS		- RFW HARDWARE UNAVAILABLE - VESSEL INJECTION WITH CRDHS UNAVAILABLE			
94	TURBINE TRIP - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - STANDBY LIQUID CONTROL SYSTEM UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN		- VESSEL INJECTION WITH CRDHS UNAVAILABLE	OIAV	7.14E-09	.13
95	LOSS OF RAW COOLING WATER - 500 KV OFFSITE GRID UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RCIC UNAVAILABLE (6 HOURS) - HPCI UNAVAILABLE (6 HOURS) - RPV DEPRESSURIZATION		- RAW COOLING WATER SYSTEM UNAVAILABLE - MAIN CONDENSER UNAVAILABLE - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - VESSEL INJECTION WITH CRDHS UNAVAILABLE	MIAV	7.03E-09	.13
96	TURBINE TRIP - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 1 RELIEF VALVE STUCK OPEN - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE		- VESSEL INJECTION WITH CRDHS UNAVAILABLE - OPERATOR FAILS TO ESTABLISH TORUS COOLING	OIBV	6.96E-09	.13
97	LOSS OF RAW COOLING WATER - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - RCIC UNAVAILABLE (6 HOURS) - HPCI UNAVAILABLE (6 HOURS) - RPV DEPRESSURIZATION		- RAW COOLING WATER SYSTEM UNAVAILABLE - MAIN CONDENSER UNAVAILABLE - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - VESSEL INJECTION WITH CRDHS UNAVAILABLE	MIAZ	6.77E-09	.13
98	TOTAL LOSS OF OFFSITE POWER - DG A UNAVAILABLE - FUEL OIL FOR DIESEL D UNAVAILABLE - DG B UNAVAILABLE - FAILURE TO RECOVER OFFSITE POWER IN 30 MINUTES - DG 3D UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN - FAILURE TO RECOVER ELECTRIC POWER IN 6 HOURS		- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - DG D UNAVAILABLE - 4KV SD BD A UNAVAILABLE - 480V SHUTDOWN BOARD 1A - 480V RMOV BD 1A POWER UNAVAILABLE - 480V DIESEL AUX. BD A POWER UNAVAILABLE - 4KV SD BD B UNAVAILABLE - 480V SHUTDOWN BOARD 2A - 480V RMOV BD 2A POWER UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - 120 V RPS BUS "A" UNAVAILABLE - 4KV SD BD D UNAVAILABLE - 480V SHUTDOWN BOARD 2B - 480V RMOV BD 2D POWER UNAVAILABLE - 480V RMOV BD 2E POWER UNAVAILABLE - 480V RMOV BD 2B POWER UNAVAILABLE - 480V RMOV BD 2C POWER UNAVAILABLE - 480V DIESEL AUX BD B POWER UNAVAILABLE - 120 V RPS BUS "B" UNAVAILABLE - 4KV UNIT BD 3A UNAVAILABLE - 4KV UNIT BD 3B UNAVAILABLE - 4KV SD BD 3ED UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE	OIAX	6.69E-09	.12

Figure B-1 (Page 24 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

Rank No.	Sequence Description	Events	Guaranteed Events/Comments	End State	Frequency (per year)	Percent
			- RX BUILDING COMPONENT COOLING WATER SYSTEM UNAVAILABLE - RHRSW PUMP A2 UNAVAILABLE - RHRSW PUMP A1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP C2 UNAVAILABLE - RHRSW PUMP C1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP D2 UNAVAILABLE - RHRSW PUMP D1 (SWING PUMP) UNAVAILABLE - PLANT CONTROL AIR SYSTEM UNAVAILABLE - DRYWELL CONTROL AIR SYSTEM UNAVAILABLE - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL - RCIC UNAVAILABLE LONG TERM - HPCI UNAVAILABLE LONG TERM - VESSEL INJECTION WITH CRDHS UNAVAILABLE - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE - U3 TO U2 RHR CROSS CONNECT UNAVAILABLE - CS LOW PRESSURE INJECTION UNAVAILABLE - RHR LOW PRESSURE INJECTION PATH UNAVAILABLE			
99	TOTAL LOSS OF OFFSITE POWER - FUEL OIL SYSTEM FOR DIESEL A UNAVAILABLE - DG D UNAVAILABLE - DG B UNAVAILABLE - FAILURE TO RECOVER OFFSITE POWER IN 30 MINUTES - DG 3D UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE = 0 RELIEF VALVES STUCK OPEN - FAILURE TO RECOVER ELECTRIC POWER IN 6 HOURS		- 500 KV OFFSITE GRID UNAVAILABLE - 161 KV OFFSITE GRID UNAVAILABLE - OPERATOR FAILS TO RESTORE POWER TO UNIT BOARDS - 4KV UNIT BD 1A UNAVAILABLE - 4KV UNIT BD 1B UNAVAILABLE - 4KV UNIT BD 2A UNAVAILABLE - 4KV UNIT BD 2B UNAVAILABLE - SHUTDOWN BUS 1 UNAVAILABLE - SHUTDOWN BUS 2 UNAVAILABLE - DG A UNAVAILABLE - 4KV SD BD A UNAVAILABLE - 480V SHUTDOWN BOARD 1A - 480V RMOV BD 1A POWER UNAVAILABLE - 480V DIESEL AUX. BD A POWER UNAVAILABLE - 4KV SD BD B UNAVAILABLE - 480V SHUTDOWN BOARD 2A - 480V RMOV BD 2A POWER UNAVAILABLE - 4KV UNIT BD 2C POWER UNAVAILABLE - 120 V RPS BUS "A" UNAVAILABLE - 4KV SD BD D UNAVAILABLE - 480V SHUTDOWN BOARD 2B - 480V RMOV BD 2D POWER UNAVAILABLE - 480V RMOV BD 2E POWER UNAVAILABLE - 480V RMOV BD 2B POWER UNAVAILABLE - 480V RMOV BD 2C POWER UNAVAILABLE - 480V DIESEL AUX BD B POWER UNAVAILABLE - 120 V RPS BUS "B" UNAVAILABLE - 4KV UNIT BD 3A UNAVAILABLE - 4KV UNIT BD 3B UNAVAILABLE - 4KV SD BD 3ED UNAVAILABLE - RAW COOLING WATER SYSTEM UNAVAILABLE - RX BUILDING COMPONENT COOLING WATER SYSTEM UNAVAILABLE - RHRSW PUMP A2 UNAVAILABLE - RHRSW PUMP A1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP C2 UNAVAILABLE - RHRSW PUMP C1 (SWING PUMP) UNAVAILABLE - RHRSW PUMP D2 UNAVAILABLE - RHRSW PUMP D1 (SWING PUMP) UNAVAILABLE - PLANT CONTROL AIR SYSTEM UNAVAILABLE - DRYWELL CONTROL AIR SYSTEM UNAVAILABLE - MSIVS FAIL TO REMAIN OPEN - 1 CND/CND BSTR PUMP, INCLUDES SHORT CYCLE VALVE UNAVAILABL	OIAX	6.68E-09	.12

Figure B-1 (Page 25 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

MODEL Name: BFNU2M | Top-Ranking Sequences Contributing to Group : ALL Frequency
ALL = ALL DAMAGE STATES EXCEPT SUCCESS | 07:56:48 09 MAY 1996

Rank No.	Sequence Description	Events: Guaranteed Events/Comments	End State	Frequency (per year)	Percent
		- RCIC UNAVAILABLE LONG TERM - HPCI UNAVAILABLE LONG TERM - VESSEL INJECTION WITH CRDHS UNAVAILABLE - RHR PUMP A UNAVAILABLE - RHR PUMP C UNAVAILABLE - RHR PUMP B UNAVAILABLE - RHR PUMP D UNAVAILABLE - U3 TO U2 RHR CROSS CONNECT UNAVAILABLE - CS LOW PRESSURE INJECTION UNAVAILABLE - RHR LOW PRESSURE INJECTION PATH UNAVAILABLE			
100	FEEDWATER RAMPUP - AUTOMATIC/MANUAL REACTOR SCRAM FAILURE - STANDBY LIQUID CONTROL SYSTEM UNAVAILABLE - CONDITIONS RELATING TO STUCK OPEN SRVS (0, 1, 2, 3+ SORVS) STATE - 0 RELIEF VALVES STUCK OPEN	- INITIATOR IS BOC, FWRU, PRFOPEN - INITIATOR IS FWRU - RFW HARDWARE UNAVAILABLE	OIAV	6.67E-09	.I2

Figure B-1 (Page 26 of 26). Top 100 Sequences in Browns Ferry Unit 2 PSA Model

APPENDIX C. SPLIT FRACTION IMPORTANCE MEASURES

MODEL Name: BFNU2M
Split Fraction Importance for Group : ALL
Sorted by Fraction Importance
Group Frequency = 5.3621E-06

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.....	SF Name...	Fraction... Importance	Fussel-Vesely. Importance	Birnbaum... Importance	Achievement. Worth	Reduction... Worth	SF Value.....	Frequency.
1.	FIWTRF	9.9136E-01			1.0000E+00		1.0000E+00	5.3158E-06
2.	NCDF	9.9136E-01			1.0000E+00		1.0000E+00	5.3158E-06
3.	MELTF	9.9136E-01			1.0000E+00		1.0000E+00	5.3158E-06
4.	DWF	8.9860E-01			1.0000E+00		1.0000E+00	4.8184E-06
5.	CPRECF	8.9404E-01			1.0000E+00		1.0000E+00	4.7940E-06
6.	SDRECF	8.9387E-01			1.0000E+00		1.0000E+00	4.7930E-06
7.	UBRECF	8.7644E-01			1.0000E+00		1.0000E+00	4.6996E-06
8.	FWAF	7.5164E-01			1.0000E+00		1.0000E+00	4.0304E-06
9.	HSF	6.3026E-01			1.0000E+00		1.0000E+00	3.3795E-06
10.	CDAF	6.2987E-01			1.0000E+00		1.0000E+00	3.3775E-06
11.	INAF	5.6329E-01			1.0000E+00		1.0000E+00	3.0205E-06
12.	CRDF	5.2907E-01			1.0000E+00		1.0000E+00	2.8369E-06
13.	HRLF	4.9733E-01			1.0000E+00		1.0000E+00	2.6668E-06
14.	INBF	4.7587E-01			1.0000E+00		1.0000E+00	2.5517E-06
15.	INCF	4.7587E-01			1.0000E+00		1.0000E+00	2.5517E-06
16.	INDF	4.7141E-01			1.0000E+00		1.0000E+00	2.5277E-06
17.	INEF	4.6898E-01			1.0000E+00		1.0000E+00	2.5147E-06
18.	INFF	4.5246E-01			1.0000E+00		1.0000E+00	2.4262E-06
19.	RXS1	4.0590E-01	4.0589E-01		1.8818E+04	5.9411E-01	2.1570E-05	2.1765E-06
20.	NAF	4.0503E-01			1.0000E+00		1.0000E+00	2.1718E-06
21.	RVC0	3.8344E-01	-4.8803E+00		6.4449E-01	5.8803E+00	9.3210E-01	2.0561E-06
22.	IVOF	3.7850E-01			1.0000E+00		1.0000E+00	2.0296E-06
23.	CDF	3.7010E-01			1.0000E+00		1.0000E+00	1.9845E-06
24.	HR6F	3.6373E-01			1.0000E+00		1.0000E+00	1.9504E-06
25.	LPRESF	3.6073E-01			1.0000E+00		1.0000E+00	1.9343E-06
26.	RCWF	3.5883E-01			1.0000E+00		1.0000E+00	1.9241E-06
27.	INGF	3.2005E-01			1.0000E+00		1.0000E+00	1.7161E-06
28.	NRVF	3.0076E-01			1.0000E+00		1.0000E+00	1.6127E-06
29.	OAIF	2.9582E-01			1.0000E+00		1.0000E+00	1.5863E-06
30.	INHF	2.8736E-01			1.0000E+00		1.0000E+00	1.5409E-06
31.	JHF	2.8091E-01			1.0000E+00		1.0000E+00	1.5063E-06
32.	JAF	2.8091E-01			1.0000E+00		1.0000E+00	1.5063E-06
33.	OSPF	2.6912E-01			1.0000E+00		1.0000E+00	1.4430E-06
34.	DWSF	2.6527E-01			1.0000E+00		1.0000E+00	1.4224E-06
35.	OGSF	2.6506E-01			1.0000E+00		1.0000E+00	1.4213E-06
36.	UB42AF	2.5436E-01			1.0000E+00		1.0000E+00	1.3639E-06
37.	UB41AF	2.5436E-01			1.0000E+00		1.0000E+00	1.3639E-06
38.	UB41BF	2.5436E-01			1.0000E+00		1.0000E+00	1.3639E-06
39.	SHUT1F	2.5436E-01			1.0000E+00		1.0000E+00	1.3639E-06
40.	UB42BF	2.5436E-01			1.0000E+00		1.0000E+00	1.3639E-06
41.	SHT2F	2.5436E-01			1.0000E+00		1.0000E+00	1.3639E-06
42.	UB42CF	2.5258E-01			1.0000E+00		1.0000E+00	1.3544E-06
43.	OUBF	2.5202E-01			1.0000E+00		1.0000E+00	1.3513E-06
44.	OG16F	2.5195E-01			1.0000E+00		1.0000E+00	1.3510E-06
45.	DCAF	2.4682E-01			1.0000E+00		1.0000E+00	1.3235E-06
46.	RPAF	2.4566E-01			1.0000E+00		1.0000E+00	1.3173E-06
47.	RPBF	2.4371E-01			1.0000E+00		1.0000E+00	1.3068E-06
48.	WETF	2.4354E-01			1.0000E+00		1.0000E+00	1.3059E-06
49.	LPCF	2.4243E-01			1.0000E+00		1.0000E+00	1.2999E-06
50.	RPCF	2.3836E-01			1.0000E+00		1.0000E+00	1.2781E-06
51.	U3F	2.3296E-01			1.0000E+00		1.0000E+00	1.2492E-06
52.	PCAF	2.1047E-01			1.0000E+00		1.0000E+00	1.1286E-06
53.	U1F	2.0816E-01			1.0000E+00		1.0000E+00	1.1162E-06
54.	UB43BF	2.0338E-01			1.0000E+00		1.0000E+00	1.0906E-06
55.	UB43AF	2.0338E-01			1.0000E+00		1.0000E+00	1.0906E-06
56.	FWHF	2.0054E-01			1.0000E+00		1.0000E+00	1.0753E-06
57.	RBCF	1.9964E-01			1.0000E+00		1.0000E+00	1.0705E-06
58.	RPDF	1.9224E-01			1.0000E+00		1.0000E+00	1.0308E-06
59.	KCF	1.8599E-01			1.0000E+00		1.0000E+00	9.9729E-07
60.	KFF	1.8344E-01			1.0000E+00		1.0000E+00	9.8361E-07
61.	KHF	1.8336E-01			1.0000E+00		1.0000E+00	9.8318E-07
62.	HUMF	1.7391E-01			1.0000E+00		1.0000E+00	9.3251E-07
63.	RCLF	1.7373E-01			1.0000E+00		1.0000E+00	9.3155E-07
64.	SW2BF	1.7320E-01			1.0000E+00		1.0000E+00	9.2873E-07
65.	MCDF	1.7302E-01			1.0000E+00		1.0000E+00	9.2777E-07
66.	EBF	1.7010E-01			1.0000E+00		1.0000E+00	9.1210E-07
67.	RFF	1.6989E-01			1.0000E+00		1.0000E+00	9.1098E-07
68.	RRF	1.6987E-01			1.0000E+00		1.0000E+00	9.1087E-07
69.	ACF	1.6968E-01			1.0000E+00		1.0000E+00	9.0987E-07
70.	DKF	1.6837E-01			1.0000E+00		1.0000E+00	9.0280E-07
71.	HPLF	1.6695E-01			1.0000E+00		1.0000E+00	8.9521E-07
72.	RHF	1.6465E-01			1.0000E+00		1.0000E+00	8.8287E-07
73.	SGTOPF	1.6230E-01			1.0000E+00		1.0000E+00	8.7026E-07
74.	RSF	1.6172E-01			1.0000E+00		1.0000E+00	8.6718E-07
75.	SW1CF	1.5982E-01			1.0000E+00		1.0000E+00	8.5696E-07

MODEL Name: BFNU2M
Split Fraction Importance for Group : ALL
Sorted by Fraction Importance
Group Frequency = 5.3621E-06

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.....	SF Name...	Fraction... Importance	Fussel-Vesely. Importance	Birnbaum... Importance	Achievement. Worth	Reduction... Worth	SF Value.....	Frequency.
76.	SW2CF	1.5982E-01			1.0000E+00		1.0000E+00	8.5696E-07
77.	ABF	1.5788E-01			1.0000E+00		1.0000E+00	8.4657E-07
78.	RCI1	1.5061E-01	1.2195E-01		2.7187E+00	8.7805E-01	6.6250E-02	8.0759E-07
79.	RVC4	1.4698E-01	-1.1642E+00		8.6950E-01	2.1642E+00	8.9920E-01	7.8812E-07
80.	DLF	1.4361E-01			1.0000E+00		1.0000E+00	7.7007E-07
81.	RIF	1.4309E-01			1.0000E+00		1.0000E+00	7.6728E-07
82.	RJF	1.4309E-01			1.0000E+00		1.0000E+00	7.6728E-07
83.	RTF	1.4180E-01			1.0000E+00		1.0000E+00	7.6035E-07
84.	RNF	1.4180E-01			1.0000E+00		1.0000E+00	7.6035E-07
85.	ADF	1.4024E-01			1.0000E+00		1.0000E+00	7.5201E-07
86.	SW2AF	1.3922E-01			1.0000E+00		1.0000E+00	7.4651E-07
87.	SW1AF	1.3922E-01			1.0000E+00		1.0000E+00	7.4651E-07
88.	RVD22	1.3420E-01	1.3401E-01		1.6888E+02	8.6599E-01	7.9760E-04	7.1962E-07
89.	RQF	1.3307E-01			1.0000E+00		1.0000E+00	7.1355E-07
90.	REF	1.3307E-01			1.0000E+00		1.0000E+00	7.1355E-07
91.	RMF	1.3307E-01			1.0000E+00		1.0000E+00	7.1355E-07
92.	AAF	1.3302E-01			1.0000E+00		1.0000E+00	7.1328E-07
93.	HPI4	1.3091E-01	1.2903E-01		2.0451E+00	8.7097E-01	1.0990E-01	7.0198E-07
94.	SGTF	1.2864E-01			1.0000E+00		1.0000E+00	6.8980E-07
95.	SW1DF	1.2674E-01			1.0000E+00		1.0000E+00	6.7962E-07
96.	EAF	1.2404E-01			1.0000E+00		1.0000E+00	6.6510E-07
97.	ROF	1.1952E-01			1.0000E+00		1.0000E+00	6.4089E-07
98.	RXF	1.1952E-01			1.0000E+00		1.0000E+00	6.4089E-07
99.	A3EAF	1.1945E-01			1.0000E+00		1.0000E+00	6.4052E-07
100.	OEEF	1.1564E-01			1.0000E+00		1.0000E+00	6.2009E-07
101.	U3AP1	1.1510E-01	-3.9532E-02		7.7599E-01	1.0395E+00	1.5000E-01	6.1719E-07
102.	ORPF	1.1438E-01			1.0000E+00		1.0000E+00	6.1334E-07
103.	OLA1	1.1380E-01	1.0943E-01		2.2914E+00	8.9057E-01	7.8120E-02	6.1022E-07
104.	RVCS	1.1301E-01	1.0148E-01		1.9944E+00	8.9852E-01	9.2600E-02	6.0599E-07
105.	RLF	1.1252E-01			1.0000E+00		1.0000E+00	6.0334E-07
106.	RKF	1.1252E-01			1.0000E+00		1.0000E+00	6.0334E-07
107.	SW2DF	1.1238E-01			1.0000E+00		1.0000E+00	6.0259E-07
108.	GA1	1.1184E-01	1.0011E-01		2.0173E+00	8.9989E-01	8.9590E-02	5.9968E-07
109.	SW1BF	1.1025E-01			1.0000E+00		1.0000E+00	5.9116E-07
110.	A3EDF	1.0866E-01			1.0000E+00		1.0000E+00	5.8264E-07
111.	OSP1	1.0863E-01	1.0861E-01		1.3904E+03	8.9139E-01	7.8170E-05	5.8248E-07
112.	DOF	1.0605E-01			1.0000E+00		1.0000E+00	5.6865E-07
113.	RVD45	9.6736E-02			1.0000E+00		1.0000E+00	5.1871E-07
114.	A3EBF	9.6647E-02			1.0000E+00		1.0000E+00	5.1824E-07
115.	OSDF	9.5697E-02			1.0000E+00		1.0000E+00	5.1314E-07
116.	ECF	9.5559E-02			1.0000E+00		1.0000E+00	5.1240E-07
117.	EDF	9.0289E-02			1.0000E+00		1.0000E+00	4.8414E-07
118.	RYF	8.6703E-02			1.0000E+00		1.0000E+00	4.6491E-07
119.	RPF	8.6703E-02			1.0000E+00		1.0000E+00	4.6491E-07
120.	A3ECF	8.6684E-02			1.0000E+00		1.0000E+00	4.6481E-07
121.	GB4	8.2113E-02	8.1604E-02		1.4166E+00	9.1840E-01	1.6380E-01	4.4030E-07
122.	RVC1	8.1004E-02	7.5692E-02		2.1543E+00	9.2431E-01	6.1540E-02	4.3435E-07
123.	R480F	7.9728E-02			1.0000E+00		1.0000E+00	4.2751E-07
124.	CSF	7.9589E-02			1.0000E+00		1.0000E+00	4.2677E-07
125.	OBCF	7.9282E-02			1.0000E+00		1.0000E+00	4.2512E-07
126.	SPF	7.6493E-02			1.0000E+00		1.0000E+00	4.1016E-07
127.	DNF	7.5316E-02			1.0000E+00		1.0000E+00	4.0385E-07
128.	LECF	7.4918E-02			1.0000E+00		1.0000E+00	4.0172E-07
129.	GD2	7.4502E-02	7.1498E-02		1.7263E+00	9.2850E-01	8.9620E-02	3.9949E-07
130.	EPR304	7.3429E-02	7.3420E-02		1.2002E+00	9.2658E-01	2.6830E-01	3.9374E-07
131.	SL1	7.2476E-02	7.1097E-02		1.3274E+01	9.2890E-01	5.7591E-03	3.8863E-07
132.	RBISOF	7.1768E-02			1.0000E+00		1.0000E+00	3.8483E-07
133.	RBI2	7.1768E-02	-3.2308E-02		7.1453E-01	1.0323E+00	1.0167E-01	3.8483E-07
134.	OSVF	7.1460E-02			1.0000E+00		1.0000E+00	3.8318E-07
135.	EPR64	7.0056E-02	7.0048E-02		1.5186E+00	9.2995E-01	1.1900E-01	3.7565E-07
136.	GE1	6.9091E-02	5.6567E-02		1.3843E+00	9.4343E-01	1.2830E-01	3.7047E-07
137.	AIF	6.7480E-02			1.0000E+00		1.0000E+00	3.6184E-07
138.	VNTF	6.7480E-02			1.0000E+00		1.0000E+00	3.6184E-07
139.	RPA1	6.5115E-02	5.5221E-02		4.7983E+00	9.4478E-01	1.4330E-02	3.4916E-07
140.	CRD4	6.4821E-02	5.9881E-02		2.4751E+00	9.4012E-01	3.9011E-02	3.4758E-07
141.	RPC2	6.1680E-02	5.9963E-02		1.0874E+00	9.4004E-01	4.0700E-01	3.3074E-07
142.	EPR303	6.1541E-02	6.1497E-02		1.2416E+00	9.3850E-01	2.0290E-01	3.2999E-07
143.	EPR63	6.0592E-02	6.0592E-02		1.4469E+00	9.3941E-01	1.1940E-01	3.2490E-07
144.	BVRF	5.9101E-02			1.0000E+00		1.0000E+00	3.1691E-07
145.	RCIF	5.9099E-02			1.0000E+00		1.0000E+00	3.1689E-07
146.	HPIF	5.7394E-02			1.0000E+00		1.0000E+00	3.0776E-07
147.	SPRF	5.6774E-02			1.0000E+00		1.0000E+00	3.0443E-07
148.	GHF	5.5809E-02			1.0000E+00		1.0000E+00	2.9926E-07
149.	OSL1	5.5676E-02	5.4418E-02		1.1134E+01	9.4558E-01	5.3410E-03	2.9854E-07
150.	OBDF	5.3388E-02			1.0000E+00		1.0000E+00	2.8628E-07
151.	GC4	5.1013E-02	3.9727E-02		1.0590E+00	9.6027E-01	4.0240E-01	2.7354E-07
152.	CADF	5.0087E-02			1.0000E+00		1.0000E+00	2.6858E-07
153.	GEF	4.9204E-02			1.0000E+00		1.0000E+00	2.6384E-07
154.	GFF	4.7075E-02			1.0000E+00		1.0000E+00	2.5243E-07
155.	EPR302	4.5367E-02	4.4914E-02		1.1835E+00	9.5509E-01	1.9660E-01	2.4326E-07
156.	GGF	4.5350E-02			1.0000E+00		1.0000E+00	2.4317E-07

PLG

MODEL Name: BFNU2M
Split Fraction Importance for Group : ALL
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.....	SF Name...	Fraction... Importance	Fussel-Vesely. Importance	Birnbaum... Importance	Achievement. Worth	Reduction... Worth	SF Value.....	Frequency.
157.	NPIIF	4.3803E-02			1.0000E+00		1.0000E+00	2.3488E-07
158.	NH2F	4.3803E-02			1.0000E+00		1.0000E+00	2.3488E-07
159.	EPR62	4.3218E-02	4.3204E-02		1.3180E+00	9.5680E-01	1.1960E-01	2.3174E-07
160.	RPB1	4.2995E-02	3.4635E-02		3.4518E+00	9.6536E-01	1.3930E-02	2.3054E-07
161.	NH1F	4.2535E-02			1.0000E+00		1.0000E+00	2.2808E-07
162.	NPIF	4.2535E-02			1.0000E+00		1.0000E+00	2.2808E-07
163.	RPD2	4.1382E-02	3.6989E-02		1.0531E+00	9.6301E-01	4.1070E-01	2.2190E-07
164.	LVF	4.0876E-02			1.0000E+00		1.0000E+00	2.1918E-07
165.	PX1F	3.9119E-02			1.0000E+00		1.0000E+00	2.0976E-07
166.	RVC9	3.7783E-02			9.6222E-01		1.0000E+00	2.0260E-07
167.	OSL2	3.7227E-02	3.6288E-02		4.0004E+00	9.6371E-01	1.1950E-02	1.9962E-07
168.	RCF	3.7050E-02			1.0000E+00		1.0000E+00	1.9867E-07
169.	GD1	3.6332E-02	2.8609E-02		1.2907E+00	9.7139E-01	8.9590E-02	1.9482E-07
170.	OIVF	3.5500E-02			1.0000E+00		1.0000E+00	1.9036E-07
171.	GB2	3.4715E-02	3.2112E-02		1.3580E+00	9.6789E-01	8.2320E-02	1.8615E-07
172.	PX2F	3.3424E-02			1.0000E+00		1.0000E+00	1.7922E-07
173.	RBF	3.1637E-02			1.0000E+00		1.0000E+00	1.6964E-07
174.	DGC1	3.1582E-02	1.8647E-02		1.0604E+00	9.8135E-01	2.3600E-01	1.6935E-07
175.	DH3	3.0744E-02	2.9994E-02		3.2566E+01	9.7001E-01	9.4930E-04	1.6485E-07
176.	GC2	2.9862E-02	2.9003E-02		1.3372E+00	9.7100E-01	7.9200E-02	1.6012E-07
177.	GF2	2.9071E-02	2.4417E-02		1.2643E+00	9.7558E-01	8.4570E-02	1.5588E-07
178.	RVC3	2.8183E-02	2.8171E-02		6.4968E+01	9.7183E-01	4.4020E-04	1.5112E-07
179.	GC3	2.7921E-02	2.7024E-02		1.2039E+00	9.7298E-01	1.1700E-01	1.4971E-07
180.	GG1	2.7670E-02	1.9150E-02		1.1239E+00	9.8085E-01	1.3390E-01	1.4837E-07
181.	DGK	2.7251E-02	2.7246E-02		1.7445E+01	9.7275E-01	1.6540E-03	1.4613E-07
182.	SW1C1	2.6464E-02	1.3326E-02		1.1739E+00	9.8667E-01	7.1180E-02	1.4190E-07
183.	GH1	2.6221E-02	2.2963E-02		1.1287E+00	9.7704E-01	1.5140E-01	1.4060E-07
184.	NIEF	2.5961E-02			1.0000E+00		1.0000E+00	1.3921E-07
185.	GCF	2.5159E-02			1.0000E+00		1.0000E+00	1.3491E-07
186.	GDF	2.4879E-02			1.0000E+00		1.0000E+00	1.3340E-07
187.	SW2B1	2.3587E-02	-1.1023E-02		7.4694E-01	1.0110E+00	4.1740E-02	1.2648E-07
188.	FA1	2.3487E-02	1.9677E-02		2.1927E+00	9.8032E-01	1.6230E-02	1.2594E-07
189.	GAF	2.3487E-02			1.0000E+00		1.0000E+00	1.2594E-07
190.	EPR301	2.3046E-02	2.0387E-02		1.0686E+00	9.7961E-01	2.2910E-01	1.2357E-07
191.	OLPF	2.2862E-02			1.0000E+00		1.0000E+00	1.2259E-07
192.	HPI2	2.2561E-02	-1.2183E-02		8.6889E-01	1.0122E+00	8.5020E-02	1.2097E-07
193.	GBF	2.2396E-02			1.0000E+00		1.0000E+00	1.2009E-07
194.	SW2D1	2.0130E-02	-1.3938E-02		7.0862E-01	1.0139E+00	4.5650E-02	1.0794E-07
195.	NRUF	1.9976E-02			1.0000E+00		1.0000E+00	1.0712E-07
196.	GC1	1.9068E-02	1.5046E-02		1.1496E+00	9.8495E-01	9.1410E-02	1.0225E-07
197.	RPB3	1.8482E-02	1.7227E-02		1.5557E+00	9.8277E-01	3.0070E-02	9.9105E-08
198.	RPD4	1.8460E-02	1.8253E-02		1.0112E+00	9.8175E-01	6.1900E-01	9.8983E-08
199.	GH2	1.7923E-02	1.4526E-02		1.1632E+00	9.8547E-01	8.1740E-02	9.6107E-08
200.	OXF	1.7578E-02			1.0000E+00		1.0000E+00	9.4253E-08
201.	SW2C1	1.7390E-02	-1.4953E-02		6.3964E-01	1.0150E+00	3.9840E-02	9.3250E-08
202.	SW2A1	1.6803E-02	-1.5184E-02		6.0347E-01	1.0152E+00	3.6880E-02	9.0099E-08
203.	EPR61	1.6401E-02	1.5605E-02		1.1154E+00	9.8440E-01	1.1910E-01	8.7944E-08
204.	HPI6	1.5864E-02	1.3069E-02		1.1377E+00	9.8693E-01	8.6670E-02	8.5063E-08
205.	U12	1.5638E-02	1.4071E-02		1.4774E+00	9.8593E-01	2.8628E-02	8.3851E-08
206.	GB1	1.5401E-02	9.3269E-03		1.0939E+00	9.9067E-01	9.0310E-02	8.2585E-08
207.	MCD1	1.5027E-02	3.9050E-03		1.1197E+00	9.9610E-01	3.1590E-02	8.0577E-08
208.	RVC2	1.4360E-02	1.4298E-02		4.3469E+00	9.8570E-01	4.2540E-03	7.6999E-08
209.	FD2	1.3836E-02	1.3635E-02		1.6574E+00	9.8636E-01	2.0320E-02	7.4188E-08
210.	FB3	1.3623E-02	1.3563E-02		1.0479E+00	9.8644E-01	2.2050E-01	7.3050E-08
211.	FEF	1.3598E-02			1.0000E+00		1.0000E+00	7.2916E-08
212.	FGF	1.3598E-02			1.0000E+00		1.0000E+00	7.2916E-08
213.	FHF	1.3598E-02			1.0000E+00		1.0000E+00	7.2916E-08
214.	FFF	1.3598E-02			1.0000E+00		1.0000E+00	7.2916E-08
215.	FC4	1.3598E-02	1.3186E-02		1.0008E+00	9.8681E-01	9.4280E-01	7.2916E-08
216.	SW1B3	1.2958E-02	6.9628E-03		1.0944E+00	9.9304E-01	6.8680E-02	6.9481E-08
217.	GG2	1.2647E-02	7.1084E-03		1.0714E+00	9.9289E-01	9.0550E-02	6.7816E-08
218.	OAD1	1.2463E-02	1.2132E-02		9.1247E+00	9.8787E-01	1.4910E-03	6.6829E-08
219.	SW1D7	1.2348E-02	9.1889E-03		1.1122E+00	9.9081E-01	7.5690E-02	6.6212E-08
220.	SDC2	1.2033E-02	1.0634E-02		1.3159E+00	9.8937E-01	3.2569E-02	6.4524E-08
221.	TB1	1.1096E-02	1.7526E-03		1.1063E+00	9.9825E-01	1.6216E-02	5.9500E-08
222.	FD1	1.1043E-02	7.4283E-03		1.4520E+00	9.9257E-01	1.6170E-02	5.9214E-08
223.	CRD1	1.0785E-02	1.0636E-02		9.0514E+00	9.8936E-01	1.3193E-03	5.7830E-08
224.	CS4	1.0479E-02	1.0166E-02		1.2751E+00	9.8983E-01	3.5639E-02	5.6190E-08
225.	FC1	1.0317E-02	7.0071E-03		1.4263E+00	9.9299E-01	1.6170E-02	5.5324E-08
226.	NPI1	1.0073E-02	9.8045E-03		3.5344E+01	9.9020E-01	2.8540E-04	5.4010E-08
227.	NPII2	9.8947E-03	9.8947E-03		1.1509E+00	9.9011E-01	6.1540E-02	5.3057E-08
228.	OG52	9.5096E-03	-2.8105E-03		9.7604E-01	1.0028E+00	1.0500E-01	5.0992E-08
229.	RVC6	8.9890E-03	8.9017E-03		1.9167E+00	9.9110E-01	9.6170E-03	4.8200E-08
230.	DGJ	8.9828E-03	8.2793E-03		9.6602E+00	9.9172E-01	9.5510E-04	4.8167E-08
231.	RPD10	8.7182E-03	7.8663E-03		1.0122E+00	9.9213E-01	3.9220E-01	4.6748E-08
232.	CRD5	8.6950E-03	8.6746E-03		1.1346E+00	9.9133E-01	6.0532E-02	4.6624E-08
233.	TOR2	8.4541E-03	8.4529E-03		6.5182E+03	9.9155E-01	1.2970E-06	4.5332E-08
234.	RPD3	8.3792E-03	-1.0115E-03		9.9690E-01	1.0010E+00	2.4590E-01	4.4930E-08
235.	SW1A1	8.2889E-03	-7.4810E-03		8.9235E-01	1.0075E+00	6.4980E-02	4.4446E-08
236.	OLP1	8.1637E-03	8.1610E-03		4.5088E+02	9.9184E-01	1.8140E-05	4.3775E-08
237.	FB1	8.0989E-03	4.6173E-03		1.2809E+00	9.9538E-01	1.6170E-02	4.3428E-08

MODEL Name: BFNU2M
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.....	SF Name...	Fraction... Importance	Fussel-Vesely. Importance	Birnbaum... Importance	Achievement. Worth	Reduction... Worth	SF Value.....	Frequency.
238.	GF1	8.0839E-03	4.1232E-04		1.0025E+00	9.9959E-01	1.4150E-01	4.3347E-08
239.	ORP2	7.9812E-03	-4.2132E-03		8.3508E-01	1.0042E+00	2.4910E-02	4.2796E-08
240.	RDF	7.8817E-03			1.0000E+00		1.0000E+00	4.2263E-08
241.	RPD9	7.8552E-03	7.7403E-03		1.0113E+00	9.9226E-01	4.0750E-01	4.2121E-08
242.	GF4	7.6552E-03	6.8336E-03		1.0385E+00	9.9317E-01	1.5070E-01	4.1048E-08
243.	DE1	7.6552E-03	3.4176E-03		1.6860E+00	9.9658E-01	4.9570E-03	4.1048E-08
244.	SW1B1	7.6184E-03	-4.5775E-03		9.4009E-01	1.0046E+00	7.0980E-02	4.0851E-08
245.	TBF	7.4735E-03			1.0000E+00		1.0000E+00	4.0074E-08
246.	FE1	7.3903E-03	4.3812E-03		1.2656E+00	9.9562E-01	1.6230E-02	3.9628E-08
247.	RPB6	7.3359E-03	5.0009E-03		1.0073E+00	9.9500E-01	4.0700E-01	3.9336E-08
248.	PX23	7.1352E-03	7.1340E-03		9.9721E+00	9.9287E-01	7.9450E-04	3.8260E-08
249.	DJF	7.0020E-03			1.0000E+00		1.0000E+00	3.7546E-08
250.	GC7	7.0007E-03	5.3080E-03		1.0271E+00	9.9469E-01	1.6380E-01	3.7539E-08
251.	SW1D1	6.9491E-03	-3.6553E-03		9.5723E-01	1.0037E+00	7.8740E-02	3.7262E-08
252.	GD3	6.8088E-03	6.5290E-03		1.0663E+00	9.9347E-01	8.9590E-02	3.6510E-08
253.	BVR1	6.5294E-03	2.6853E-03		1.1923E+00	9.9731E-01	1.3770E-02	3.5012E-08
254.	TORF	6.4428E-03			1.0000E+00		1.0000E+00	3.4547E-08
255.	RBCQ	6.4257E-03	-1.1089E-03		9.1376E-01	1.0011E+00	1.2695E-02	3.4456E-08
256.	HRC1	5.8093E-03	5.5963E-03		1.0669E+01	9.9440E-01	5.7846E-04	3.1150E-08
257.	HXA1	5.7069E-03	1.9957E-03		1.3617E+00	9.9800E-01	5.4880E-03	3.0601E-08
258.	ODWS2	5.6613E-03	-5.4472E-03		8.0295E-01	1.0054E+00	2.6900E-02	3.0357E-08
259.	GH4	5.5316E-03	1.9081E-03		1.0147E+00	9.9809E-01	1.1520E-01	2.9661E-08
260.	OAL1	5.1367E-03	1.5191E-03		1.0940E+00	9.9848E-01	1.5910E-02	2.7544E-08
261.	FH1	5.0638E-03	2.2871E-03		1.1392E+00	9.9771E-01	1.6170E-02	2.7153E-08
262.	FF1	4.9843E-03	2.1244E-03		1.1293E+00	9.9788E-01	1.6170E-02	2.6726E-08
263.	GC6	4.8328E-03	4.7246E-03		1.0527E+00	9.9528E-01	8.2320E-02	2.5914E-08
264.	HXC2	4.4992E-03	4.4620E-03		1.1450E+00	9.9554E-01	2.9850E-02	2.4125E-08
265.	GC5	4.4692E-03	4.3897E-03		1.0442E+00	9.9561E-01	9.0310E-02	2.3964E-08
266.	HPI1	4.3350E-03	3.0198E-03		1.0323E+00	9.9698E-01	8.5600E-02	2.3245E-08
267.	HXD7	4.2918E-03	4.2918E-03		1.0030E+00	9.9571E-01	5.8920E-01	2.3013E-08
268.	HXB5	4.2918E-03	4.1936E-03		1.0089E+00	9.9581E-01	3.2150E-01	2.3013E-08
269.	RPB5	4.2202E-03	3.7806E-03		1.2645E+00	9.9622E-01	1.4090E-02	2.2630E-08
270.	LPC2	4.0604E-03	3.6542E-03		1.4478E+00	9.9635E-01	8.0944E-03	2.1772E-08
271.	DA1	4.0071E-03	2.2204E-03		2.0616E+00	9.9778E-01	2.0872E-03	2.1487E-08
272.	RPD1	4.0034E-03	-9.2292E-04		8.9006E-01	1.0009E+00	8.3250E-03	2.1467E-08
273.	GF3	3.8498E-03	3.1592E-03		1.0204E+00	9.9684E-01	1.3390E-01	2.0643E-08
274.	AB1	3.8185E-03	3.7146E-03		2.7230E+01	9.9629E-01	1.4160E-04	2.0475E-08
275.	DL1	3.7787E-03	-6.4132E-03		5.4865E-01	1.0064E+00	1.4010E-02	2.0262E-08
276.	DK1	3.7780E-03	-6.3673E-03		5.4630E-01	1.0064E+00	1.3840E-02	2.0258E-08
277.	RH1	3.7173E-03	3.5844E-03		2.3200E+01	9.9642E-01	1.6143E-04	1.9933E-08
278.	LC1	3.6623E-03	2.2434E-03		1.3779E+00	9.9776E-01	5.9020E-03	1.9638E-08
279.	RVD14	3.5416E-03	3.5391E-03		5.3315E+00	9.9646E-01	8.1640E-04	1.8991E-08
280.	U32	3.5183E-03	1.6763E-03		1.0571E+00	9.9832E-01	2.8537E-02	1.8866E-08
281.	OHS3	3.4284E-03	2.5420E-03		1.4810E+00	9.9746E-01	5.2570E-03	1.8384E-08
282.	HXDF	3.4218E-03			1.0000E+00		1.0000E+00	1.8348E-08
283.	PX11	3.4163E-03	2.6618E-03		4.3477E+00	9.9734E-01	7.9450E-04	1.8319E-08
284.	FG1	3.4080E-03	4.6626E-04		1.0284E+00	9.9953E-01	1.6170E-02	1.8274E-08
285.	DB1	3.3306E-03	1.6506E-03		1.8038E+00	9.9835E-01	2.0492E-03	1.7859E-08
286.	CS2	3.2291E-03	3.1516E-03		2.4798E+00	9.9685E-01	2.1252E-03	1.7315E-08
287.	CS5	3.1946E-03	3.0561E-03		4.3904E+00	9.9694E-01	9.0058E-04	1.7130E-08
288.	HXBF	3.1653E-03			1.0000E+00		1.0000E+00	1.6973E-08
289.	GB3	3.1220E-03	2.7576E-03		1.0280E+00	9.9724E-01	8.9590E-02	1.6740E-08
290.	OAD2	3.0062E-03	2.8964E-03		2.9674E+00	9.9710E-01	1.4700E-03	1.6120E-08
291.	RS1	2.9263E-03	2.8311E-03		2.5594E+01	9.9717E-01	1.1510E-04	1.5691E-08
292.	PX22	2.8601E-03	2.8595E-03		1.7339E+00	9.9714E-01	3.8810E-03	1.5336E-08
293.	SP21	2.7769E-03	-2.4599E-03		8.5383E-01	1.0025E+00	1.6550E-02	1.4890E-08
294.	CS7	2.7204E-03	2.6032E-03		1.0952E+00	9.9740E-01	2.6615E-02	1.4587E-08
295.	OHRF	2.6670E-03			1.0000E+00		1.0000E+00	1.4301E-08
296.	HS7	2.6489E-03	2.6489E-03		1.0268E+00	9.9735E-01	9.0000E-02	1.4204E-08
297.	RPC1	2.4904E-03	-3.1222E-03		6.4101E-01	1.0031E+00	8.6220E-03	1.3354E-08
298.	HXCF	2.3742E-03			1.0000E+00		1.0000E+00	1.2731E-08
299.	GH3	2.3727E-03	1.9583E-03		1.0119E+00	9.9804E-01	1.4150E-01	1.2723E-08
300.	OUB2	2.3441E-03	2.2422E-03		1.4444E+00	9.9776E-01	5.0200E-03	1.2569E-08
301.	HXAF	2.3436E-03			1.0000E+00		1.0000E+00	1.2567E-08
302.	FWH1	2.1824E-03	1.8552E-03		1.5886E+00	9.9814E-01	3.1422E-03	1.1702E-08
303.	HXB1	2.1519E-03	-9.2246E-04		8.2588E-01	1.0009E+00	5.2700E-03	1.1539E-08
304.	OBD1	2.1044E-03	1.1256E-03		1.0075E+00	9.9887E-01	1.3120E-01	1.1284E-08
305.	JC1	2.0717E-03	2.0549E-03		1.0409E+00	9.9795E-01	4.7790E-02	1.1109E-08
306.	TB2	2.0694E-03	1.0346E-03		1.0162E+00	9.9897E-01	6.0058E-02	1.1096E-08
307.	RC1	2.0684E-03	1.9311E-03		1.4390E+01	9.9807E-01	1.4420E-04	1.1091E-08
308.	LCF	2.0682E-03			1.0000E+00		1.0000E+00	1.1090E-08
309.	HXD1	1.8943E-03	-1.1113E-03		7.8769E-01	1.0011E+00	5.2070E-03	1.0158E-08
310.	RPC3	1.8830E-03	1.7573E-03		1.1209E+00	9.9824E-01	1.4330E-02	1.0097E-08
311.	SW1B2	1.8218E-03	1.5000E-03		1.0928E+00	9.9850E-01	1.5910E-02	9.7686E-09
312.	OLC1	1.8176E-03	1.7874E-03		4.3479E+00	9.9821E-01	5.3360E-04	9.7464E-09
313.	RB1	1.7869E-03	1.6488E-03		1.2432E+01	9.9835E-01	1.4420E-04	9.5817E-09
314.	SW2D4	1.7779E-03	1.7671E-03		1.0072E+00	9.9823E-01	1.9800E-01	9.5336E-09
315.	SW1D6	1.7779E-03	1.7779E-03		1.0010E+00	9.9822E-01	6.3610E-01	9.5336E-09
316.	DCA1	1.7061E-03	-1.7671E-03		6.2505E-01	1.0018E+00	4.6908E-03	9.1481E-09
317.	U14	1.6404E-03	5.6839E-04		1.0112E+00	9.9943E-01	4.8175E-02	8.7959E-09
318.	OAL2	1.6036E-03	4.5561E-04		1.0237E+00	9.9954E-01	1.8850E-02	8.5988E-09

MODEL Name: BFNU2M
Split Fraction Importance for Group : ALL
Sorted by Fraction Importance
Group Frequency = 5.3621E-06

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.....	SF Name...	Fraction... Importance	Fussel-Vesely. Importance	Birnbaum... Importance	Achievement. Worth	Reduction... Worth	SF Value.....	Frequency.
319.	RCL1	1.6014E-03	-6.9795E-04		9.6239E-01	1.0007E+00	1.8220E-02	8.5871E-09
320.	DC1	1.5994E-03	-8.5142E-05		9.5849E-01	1.0001E+00	2.0467E-03	8.5765E-09
321.	RPD5	1.5837E-03	9.7785E-04		1.0673E+00	9.9902E-01	1.4330E-02	8.4922E-09
322.	SW2D6	1.5493E-03	-8.3396E-04		9.8192E-01	1.0008E+00	4.4100E-02	8.3074E-09
323.	U11	1.4642E-03	1.1765E-03		1.0207E+00	9.9882E-01	5.3889E-02	7.8510E-09
324.	RVC7	1.4584E-03	1.4550E-03		1.6219E+00	9.9855E-01	2.3340E-03	7.8201E-09
325.	OJC1	1.4322E-03	1.2867E-03		1.0389E+00	9.9871E-01	3.2040E-02	7.6796E-09
326.	U31	1.4305E-03	1.1013E-03		1.0195E+00	9.9890E-01	5.3539E-02	7.6706E-09
327.	ODWS1	1.3840E-03	-4.4513E-03		5.5568E-01	1.0045E+00	9.9190E-03	7.4214E-09
328.	EA2	1.3784E-03	7.9347E-04		1.2051E+00	9.9921E-01	3.8540E-03	7.3914E-09
329.	SW1D14	1.3139E-03	-6.2223E-04		9.9186E-01	1.0006E+00	7.0980E-02	7.0454E-09
330.	HXC1	1.2026E-03	-2.2231E-03		5.8693E-01	1.0022E+00	5.3530E-03	6.4485E-09
331.	FC2	1.1691E-03	7.2640E-04		1.0442E+00	9.9927E-01	1.6160E-02	6.2688E-09
332.	DD1	1.1064E-03	-6.0225E-04		7.0158E-01	1.0006E+00	2.0141E-03	5.9327E-09
333.	AD1	1.0498E-03	9.4614E-04		7.6808E+00	9.9905E-01	1.4160E-04	5.6291E-09
334.	OHR1	1.0009E-03	9.5691E-04		1.0286E+00	9.9904E-01	3.2400E-02	5.3668E-09
335.	SW1C7	9.8109E-04	5.9051E-04		1.0085E+00	9.9941E-01	6.4980E-02	5.2607E-09
336.	RPD7	9.5999E-04	9.5999E-04		1.0014E+00	9.9904E-01	4.0700E-01	5.1476E-09
337.	PCAA	9.0557E-04	-1.3317E-03		5.4655E-01	1.0013E+00	2.9283E-03	4.8558E-09
338.	HS6	8.5945E-04	8.5945E-04		1.0052E+00	9.9914E-01	1.4200E-01	4.6085E-09
339.	RXS2	8.5366E-04	8.5359E-04		4.0887E+01	9.9915E-01	2.1400E-05	4.5774E-09
340.	HXB6	8.4032E-04	5.8941E-04		1.1068E+00	9.9941E-01	5.4880E-03	4.5059E-09
341.	HS4	8.2599E-04	8.2599E-04		1.0019E+00	9.9917E-01	3.0000E-01	4.4291E-09
342.	GG3	8.1322E-04	-9.3519E-05		9.9936E-01	1.0001E+00	1.2830E-01	4.3606E-09
343.	DH1	7.9672E-04	7.6347E-04		1.1496E+00	9.9924E-01	5.0780E-03	4.2721E-09
344.	RBCT	7.8314E-04	-1.0897E-03		9.4458E-01	1.0011E+00	1.9284E-02	4.1993E-09
345.	SL2	7.6839E-04	7.5709E-04		1.0268E+00	9.9924E-01	2.7449E-02	4.1202E-09
346.	RBCN	7.4489E-04	-6.5874E-04		9.8810E-01	1.0007E+00	5.2470E-02	3.9942E-09
347.	GF5	7.2326E-04	6.3330E-04		1.0064E+00	9.9937E-01	9.0550E-02	3.8782E-09
348.	EB6	7.0939E-04	6.6121E-04		1.1726E+00	9.9934E-01	3.8170E-03	3.8039E-09
349.	UB42C1	6.9647E-04	6.0166E-04		5.6838E+00	9.9940E-01	1.2844E-04	3.7346E-09
350.	EB5	6.9235E-04	6.9130E-04		1.0212E+00	9.9931E-01	3.1580E-02	3.7125E-09
351.	VNT1	6.9186E-04	-5.2956E-05		9.8869E-01	1.0001E+00	4.6587E-03	3.7099E-09
352.	SW2D7	6.8216E-04	-5.9693E-04		9.8630E-01	1.0006E+00	4.1740E-02	3.6579E-09
353.	HS2	6.8176E-04	6.8176E-04		1.0073E+00	9.9932E-01	8.5000E-02	3.6557E-09
354.	CIS1	6.7773E-04	-3.5155E-03		1.6944E-01	1.0035E+00	4.2148E-03	3.6341E-09
355.	GH5	6.7755E-04	-5.4675E-05		9.9941E-01	1.0001E+00	8.4570E-02	3.6331E-09
356.	FB2	6.7368E-04	3.4482E-04		1.0210E+00	9.9966E-01	1.6160E-02	3.6124E-09
357.	HPL1	6.4813E-04	-1.3206E-03		9.2271E-01	1.0013E+00	1.6800E-02	3.4754E-09
358.	EA1	6.4645E-04	-3.1659E-05		9.6666E-01	1.0000E+00	9.4870E-04	3.4664E-09
359.	OF4	6.3063E-04	-2.6202E-04		9.6657E-01	1.0003E+00	7.7770E-03	3.3815E-09
360.	EC10	6.2043E-04	5.9601E-04		1.0006E+00	9.9940E-01	5.0110E-01	3.3268E-09
361.	OSP2	6.1956E-04	-1.2038E-03		7.9272E-01	1.0012E+00	5.7740E-03	3.3222E-09
362.	DV2F	5.9665E-04			1.0000E+00		1.0000E+00	3.1993E-09
363.	SW1D17	5.7405E-04	4.0453E-04		1.0051E+00	9.9960E-01	7.2920E-02	3.0781E-09
364.	RT1	5.7318E-04	4.8154E-04		5.1832E+00	9.9952E-01	1.1510E-04	3.0735E-09
365.	HS3	5.7186E-04	5.7186E-04		1.0095E+00	9.9943E-01	5.7000E-02	3.0664E-09
366.	RXS10	5.6947E-04	5.6881E-04		1.8610E+02	9.9943E-01	3.0730E-06	3.0536E-09
367.	ED29	5.6730E-04	4.6191E-04		1.0001E+00	9.9954E-01	7.8590E-01	3.0419E-09
368.	HPL3	5.3575E-04	4.7408E-04		1.0052E+00	9.9953E-01	8.3410E-02	2.8728E-09
369.	SW1D16	5.2373E-04	3.5829E-04		1.0049E+00	9.9964E-01	6.8680E-02	2.8083E-09
370.	RI1	5.1909E-04	3.8221E-04		3.3673E+00	9.9962E-01	1.6143E-04	2.7834E-09
371.	DJ1	4.9371E-04	-3.3279E-06		9.9341E-01	1.0000E+00	5.0510E-04	2.6473E-09
372.	ED34	4.9234E-04	4.8312E-04		1.1290E+00	9.9952E-01	3.7310E-03	2.6400E-09
373.	SP11	4.7964E-04	3.4617E-04		1.3941E+00	9.9965E-01	8.7750E-04	2.5719E-09
374.	SW2D5	4.6123E-04	-5.1631E-04		9.8850E-01	1.0005E+00	4.2970E-02	2.4732E-09
375.	RT3	4.5414E-04	4.4841E-04		4.8954E+00	9.9955E-01	1.1510E-04	2.4352E-09
376.	DGB	4.4386E-04	4.4323E-04		1.2480E+00	9.9956E-01	1.7840E-03	2.3800E-09
377.	RK3	4.4216E-04	-8.4462E-04		9.6607E-01	1.0008E+00	2.4290E-02	2.3709E-09
378.	HPL5	4.2277E-04	4.9732E-05		1.0027E+00	9.9995E-01	1.8020E-02	2.2670E-09
379.	SDCF	4.1815E-04			1.0000E+00		1.0000E+00	2.2422E-09
380.	PX21	3.8385E-04	-3.6589E-04		5.3838E-01	1.0004E+00	7.9200E-04	2.0583E-09
381.	FWH2	3.8025E-04	3.4176E-05		1.0014E+00	9.9997E-01	2.4612E-02	2.0390E-09
382.	CD1	3.7633E-04	-2.3289E-04		8.1466E-01	1.0002E+00	1.2550E-03	2.0179E-09
383.	EC12	3.7381E-04	2.5725E-04		1.0668E+00	9.9974E-01	3.8390E-03	2.0044E-09
384.	CRD3	3.7113E-04	-3.5649E-04		9.9114E-01	1.0004E+00	3.8661E-02	1.9901E-09
385.	OHC4	3.7078E-04	-1.3092E-03		8.7482E-01	1.0013E+00	1.0350E-02	1.9882E-09
386.	EB2	3.7027E-04	3.6677E-04		1.0289E+00	9.9963E-01	1.2530E-02	1.9854E-09
387.	CRD2	3.6898E-04	3.6779E-04		1.0434E+00	9.9963E-01	8.3944E-03	1.9785E-09
388.	PCAB	3.6539E-04	-4.8561E-04		9.9125E-01	1.0005E+00	5.2577E-02	1.9592E-09
389.	HXD10	3.6393E-04	1.3260E-04		1.0240E+00	9.9987E-01	5.4880E-03	1.9515E-09
390.	OHL1	3.6386E-04	1.5049E-04		1.1019E+00	9.9985E-01	1.4740E-03	1.9511E-09
391.	DV21	3.6062E-04	3.4669E-04		1.0764E+00	9.9965E-01	4.5200E-03	1.9337E-09
392.	NH11	3.3817E-04	-2.5283E-03		1.6341E-01	1.0025E+00	3.0130E-03	1.8133E-09
393.	NH21	3.3810E-04	-2.4833E-03		1.6805E-01	1.0025E+00	2.9760E-03	1.8129E-09
394.	ED5	3.3553E-04	3.3553E-04		1.0008E+00	9.9966E-01	2.9250E-01	1.7992E-09
395.	EC2	3.3553E-04	3.3553E-04		1.0287E+00	9.9966E-01	1.1550E-02	1.7992E-09
396.	DF1	3.2246E-04	-2.4721E-03		2.2905E-01	1.0025E+00	3.1963E-03	1.7291E-09
397.	RPD8	3.1744E-04	1.6818E-04		1.0119E+00	9.9983E-01	1.3930E-02	1.7021E-09
398.	AD32	2.9958E-04	2.8719E-04		1.4112E+00	9.9971E-01	6.9790E-04	1.6064E-09
399.	EB1	2.9225E-04	-3.9922E-04		5.8794E-01	1.0004E+00	9.6790E-04	1.5671E-09

PLG

.....	SF Name...	Fraction... Importance	Fussel-Vesely. Importance	Birnbaum... Importance	Achievement. Worth	Reduction... Worth	SF Value.....	Frequency.
400.	SW1D11	2.6864E-04	-2.9022E-04		9.9635E-01	1.0003E+00	7.3590E-02	1.4405E-09
401.	RT2	2.6619E-04	2.6590E-04		3.1598E+00	9.9973E-01	1.2310E-04	1.4274E-09
402.	NBOCF	2.6529E-04			1.0000E+00		1.0000E+00	1.4225E-09
403.	RVL3	2.5859E-04	2.5859E-04		1.3211E+00	9.9974E-01	8.0480E-04	1.3866E-09
404.	RPT1	2.5818E-04	2.1200E-04		2.8342E+00	9.9979E-01	1.1557E-04	1.3844E-09
405.	SGT2	2.4595E-04	-1.0669E-03		9.5942E-01	1.0011E+00	2.5619E-02	1.3188E-09
406.	DE2	2.2643E-04	-3.9420E-04		9.1562E-01	1.0004E+00	4.6501E-03	1.2141E-09
407.	DF2	2.2201E-04	-9.0373E-05		9.6549E-01	1.0001E+00	2.6116E-03	1.1904E-09
408.	LPC1	2.1506E-04	1.8331E-04		1.5794E+00	9.9982E-01	3.1630E-04	1.1532E-09
409.	GB6	2.1220E-04	2.1220E-04		1.0022E+00	9.9979E-01	8.9590E-02	1.1378E-09
410.	DK2	2.1029E-04	-8.5572E-04		9.2285E-01	1.0009E+00	1.0970E-02	1.1276E-09
411.	HXD3	2.0737E-04	1.3294E-04		1.0076E+00	9.9987E-01	1.7170E-02	1.1120E-09
412.	DGL	2.0203E-04	1.1660E-04		1.1219E+00	9.9988E-01	9.5550E-04	1.0833E-09
413.	GC8	2.0124E-04	1.9878E-04		1.0020E+00	9.9980E-01	8.9590E-02	1.0791E-09
414.	EC4	1.9819E-04	1.1204E-04		1.0002E+00	9.9989E-01	3.3360E-01	1.0627E-09
415.	OLP3	1.8976E-04	-8.4544E-04		8.6375E-01	1.0008E+00	6.1670E-03	1.0175E-09
416.	SW2C4	1.8651E-04	1.8651E-04		1.0007E+00	9.9981E-01	2.1690E-01	1.0001E-09
417.	SW1A2	1.8651E-04	-7.8015E-05		9.9510E-01	1.0001E+00	1.5670E-02	1.0001E-09
418.	SW1C6	1.8651E-04	1.8651E-04		1.0001E+00	9.9981E-01	6.5990E-01	1.0001E-09
419.	VNT2	1.8463E-04	-8.2761E-04		8.6375E-01	1.0008E+00	6.0377E-03	9.9004E-10
420.	RXS4	1.8220E-04	1.8197E-04		9.7823E+00	9.9982E-01	2.0720E-05	9.7696E-10
421.	SDREC2	1.7636E-04	1.1114E-04		1.0360E+00	9.9989E-01	3.0760E-03	9.4566E-10
422.	ED10	1.7208E-04	1.7208E-04		1.0003E+00	9.9983E-01	3.4560E-01	9.2273E-10
423.	DWS2	1.6387E-04	-7.7862E-04		9.5954E-01	1.0008E+00	1.8883E-02	8.7867E-10
424.	RPB2	1.5928E-04	5.6996E-05		1.0029E+00	9.9994E-01	1.9580E-02	8.5411E-10
425.	GC9	1.5612E-04	1.0883E-04		1.0011E+00	9.9989E-01	8.9620E-02	8.3714E-10
426.	DL4	1.5592E-04	-5.8850E-04		9.4723E-01	1.0006E+00	1.1030E-02	8.3607E-10
427.	HS5	1.5125E-04	1.5125E-04		1.0010E+00	9.9985E-01	1.2600E-01	8.1101E-10
428.	FF2	1.4971E-04	-2.3099E-05		9.9859E-01	1.0000E+00	1.6160E-02	8.0277E-10
429.	NPII3	1.4732E-04	1.4689E-04		1.5145E+00	9.9985E-01	2.8540E-04	7.8994E-10
430.	AD5	1.3899E-04	1.3877E-04		3.4577E+00	9.9986E-01	5.6460E-05	7.4527E-10
431.	SP13	1.2803E-04	-8.8205E-05		9.9346E-01	1.0001E+00	1.3300E-02	6.8653E-10
432.	FH4	1.2783E-04	1.2783E-04		1.0000E+00	9.9987E-01	9.4280E-01	6.8545E-10
433.	FF3	1.2783E-04	1.2783E-04		1.0005E+00	9.9987E-01	2.2050E-01	6.8545E-10
434.	FG2	1.2783E-04	-2.2804E-05		9.9890E-01	1.0000E+00	2.0320E-02	6.8545E-10
435.	OSP3	1.2379E-04	1.1541E-04		2.5999E+00	9.9988E-01	7.2130E-05	6.6377E-10
436.	RL6	1.2213E-04	-6.3597E-04		9.7445E-01	1.0006E+00	2.4290E-02	6.5490E-10
437.	HR1	1.2078E-04	1.0996E-04		1.0121E+00	9.9989E-01	9.0000E-03	6.4766E-10
438.	CSTF	1.1941E-04			1.0000E+00		1.0000E+00	6.4028E-10
439.	OSV1	1.1905E-04	-3.6452E-04		8.4412E-01	1.0004E+00	2.3330E-03	6.3835E-10
440.	SW2D9	1.1170E-04	8.1307E-05		1.0043E+00	9.9992E-01	1.8570E-02	5.9895E-10
441.	HRC3	1.0983E-04	1.0126E-04		1.3545E+00	9.9990E-01	2.8558E-04	5.8891E-10
442.	CD5	1.0569E-04	6.8567E-05		1.0245E+00	9.9993E-01	2.7922E-03	5.6671E-10
443.	DL6	1.0115E-04	-4.1301E-04		9.6276E-01	1.0004E+00	1.0970E-02	5.4236E-10
444.	SHUT11	9.8995E-05	1.0903E-05		1.0887E+00	9.9999E-01	1.2290E-04	5.3083E-10
445.	DGM	9.6635E-05	9.6635E-05		1.0690E+00	9.9990E-01	1.3990E-03	5.1817E-10
446.	DH4	9.6635E-05	6.1982E-06		1.0112E+00	9.9999E-01	5.5120E-04	5.1817E-10
447.	AC1	9.6084E-05	-7.7137E-06		9.4553E-01	1.0000E+00	1.4160E-04	5.1522E-10
448.	DV11	9.0562E-05	8.6596E-05		1.0177E+00	9.9991E-01	4.8650E-03	4.8561E-10
449.	RBCU	8.9225E-05	-1.5414E-04		9.9316E-01	1.0002E+00	2.2039E-02	4.7844E-10
450.	DD2	8.7910E-05	-1.3382E-04		9.1338E-01	1.0001E+00	1.5425E-03	4.7139E-10
451.	RBCA	8.4886E-05	-1.9941E-04		9.9799E-01	1.0002E+00	9.0372E-02	4.5517E-10
452.	IVC1	8.3660E-05	8.2592E-05		2.0719E+00	9.9992E-01	7.7044E-05	4.4860E-10
453.	RJ1	7.9735E-05	-5.7210E-05		6.4566E-01	1.0001E+00	1.6143E-04	4.2755E-10
454.	HRC5	7.6476E-05	6.5514E-05		1.1979E+00	9.9993E-01	3.3091E-04	4.1007E-10
455.	SW2C5	7.3768E-05	-3.2780E-04		9.9144E-01	1.0003E+00	3.6880E-02	3.9555E-10
456.	DGA	7.3574E-05	4.4790E-05		1.0089E+00	9.9996E-01	5.0000E-03	3.9451E-10
457.	EC11	7.2054E-05	5.1448E-05		1.0016E+00	9.9995E-01	3.1690E-02	3.8637E-10
458.	SGT1	7.1600E-05	-1.1839E-03		2.3387E-01	1.0012E+00	1.5429E-03	3.8393E-10
459.	OX1	7.0657E-05	-8.4791E-05		9.4696E-01	1.0001E+00	1.5960E-03	3.7887E-10
460.	OG161	7.0067E-05	-3.6787E-04		3.7895E-01	1.0004E+00	5.9198E-04	3.7571E-10
461.	A3EA2	6.9841E-05	-3.1563E-06		9.9637E-01	1.0000E+00	8.6970E-04	3.7450E-10
462.	U13	6.7421E-05	-2.4234E-04		9.9551E-01	1.0002E+00	5.1228E-02	3.6152E-10
463.	FH2	6.3801E-05	-1.8983E-04		9.8844E-01	1.0002E+00	1.6160E-02	3.4211E-10
464.	OSD1	5.7924E-05	6.2850E-06		1.0059E+00	9.9999E-01	1.0630E-03	3.1060E-10
465.	RPB4	5.4642E-05	1.2802E-05		1.0009E+00	9.9999E-01	1.4330E-02	2.9300E-10
466.	SPR11	5.1146E-05	5.0921E-05		1.0969E+00	9.9995E-01	5.2530E-04	2.7425E-10
467.	ODSB1	5.0925E-05	-8.4660E-05		9.4750E-01	1.0001E+00	1.6100E-03	2.7306E-10
468.	ORP3	5.0501E-05	-1.7881E-04		9.9600E-01	1.0002E+00	4.2740E-02	2.7080E-10
469.	CD6	5.0335E-05	-8.5410E-05		9.9036E-01	1.0001E+00	8.7847E-03	2.6990E-10
470.	AA1	5.0268E-05	-5.4411E-05		6.1580E-01	1.0001E+00	1.4160E-04	2.6954E-10
471.	HXD2	5.0242E-05	-4.1150E-05		9.9223E-01	1.0000E+00	5.2700E-03	2.6941E-10
472.	ED32	4.8924E-05	2.4608E-05		1.0000E+00	9.9998E-01	5.1250E-01	2.6234E-10
473.	A3EB21	4.6012E-05	2.3251E-05		1.0289E+00	9.9998E-01	8.0440E-04	2.4673E-10
474.	AD23	4.4397E-05	2.6501E-05		1.0397E+00	9.9997E-01	6.6700E-04	2.3806E-10
475.	AC4	4.4149E-05	1.3951E-05		1.0209E+00	9.9999E-01	6.6700E-04	2.3673E-10
476.	SW1D2	4.3815E-05	-2.3121E-04		9.8070E-01	1.0002E+00	1.1840E-02	2.3494E-10
477.	SW2D8	4.3369E-05	-1.4449E-04		9.9106E-01	1.0001E+00	1.5910E-02	2.3255E-10
478.	SP2	4.2761E-05	-1.8167E-04		9.7937E-01	1.0002E+00	8.7310E-03	2.2929E-10
479.	OSW1	4.2486E-05	-5.8509E-04		2.2284E-01	1.0006E+00	7.5230E-04	2.2781E-10
480.	RBCV	4.0782E-05	-1.5170E-04		9.6751E-01	1.0002E+00	4.6474E-03	2.1868E-10

MODEL Name: BFNU2M
Split Fraction Importance for Group : ALL
Sorted by Fraction Importance
Group Frequency = 5.3621E-06

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.....	SF Name...	Fraction... Importance	Fussel-Vesely. Importance	Birnbaum... Importance	Achievement. Worth	Reduction... Worth	SF Value.....	Frequency.
481.	RL1	4.0671E-05	-6.6731E-05		5.0540E-01	1.0001E+00	1.3490E-04	2.1808E-10
482.	RK1	4.0670E-05	-6.6737E-05		5.0535E-01	1.0001E+00	1.3490E-04	2.1808E-10
483.	RVO2	3.4513E-05	2.8960E-05		3.1108E+00	9.9997E-01	1.3720E-05	1.8506E-10
484.	EB4	3.1844E-05	-3.0524E-04		9.1803E-01	1.0003E+00	3.7100E-03	1.7075E-10
485.	ED27	2.9981E-05	2.2373E-05		1.0060E+00	9.9998E-01	3.7290E-03	1.6076E-10
486.	ED36	2.9339E-05	-8.7647E-05		9.7724E-01	1.0001E+00	3.8370E-03	1.5732E-10
487.	SPR18	2.8332E-05	2.3588E-05		1.0505E+00	9.9998E-01	4.6650E-04	1.5192E-10
488.	LV1	2.5117E-05	-4.0901E-05		4.1400E-01	1.0000E+00	6.9791E-05	1.3468E-10
489.	DWS1	2.4727E-05	-8.5645E-04		3.4892E-01	1.0009E+00	1.3137E-03	1.3259E-10
490.	AB2	2.4569E-05	-3.8291E-05		9.4517E-01	1.0000E+00	6.9790E-04	1.3174E-10
491.	AC14	2.4410E-05	1.6678E-05		1.0239E+00	9.9998E-01	6.9790E-04	1.3089E-10
492.	SW1C3	2.4304E-05	-4.7589E-05		9.9500E-01	1.0000E+00	9.4230E-03	1.3032E-10
493.	ED30	2.3887E-05	0.0000E+00		1.0000E+00	1.0000E+00	5.0180E-01	1.2809E-10
494.	A3ED23	2.3805E-05	-6.9545E-06		9.9103E-01	1.0000E+00	7.7500E-04	1.2765E-10
495.	ED31	2.3328E-05	2.3328E-05		1.0014E+00	9.9998E-01	1.5900E-02	1.2509E-10
496.	UBREC2	2.3123E-05	-9.9158E-05		9.8827E-01	1.0001E+00	8.3859E-03	1.2399E-10
497.	FC3	2.3112E-05	8.9318E-06		1.0005E+00	9.9999E-01	1.6170E-02	1.2393E-10
498.	AC18	2.2984E-05	1.3952E-06		1.0018E+00	1.0000E+00	7.6310E-04	1.2324E-10
499.	SPR1	2.1572E-05	2.1572E-05		1.0496E+00	9.9998E-01	4.3480E-04	1.1567E-10
500.	SP1	2.1572E-05	1.4242E-05		1.0308E+00	9.9999E-01	4.6180E-04	1.1567E-10
501.	AD35	2.1550E-05	8.6595E-07		1.0011E+00	1.0000E+00	7.6310E-04	1.1555E-10
502.	L8H1	2.1092E-05	-1.5395E-04		9.9463E-01	1.0002E+00	2.7872E-02	1.1310E-10
503.	A3ED4	2.0519E-05	6.9308E-06		1.0092E+00	9.9999E-01	7.5350E-04	1.1003E-10
504.	SW1D8	2.0507E-05	-8.1329E-05		9.9144E-01	1.0001E+00	9.4140E-03	1.0996E-10
505.	RR1	2.0263E-05	-2.5838E-04		2.6498E-01	1.0003E+00	3.5140E-04	1.0865E-10
506.	DA2	1.9721E-05	-1.8676E-04		8.7966E-01	1.0002E+00	1.5495E-03	1.0575E-10
507.	DB2	1.9333E-05	-2.3911E-04		8.4284E-01	1.0002E+00	1.5191E-03	1.0367E-10
508.	LV2	1.9215E-05	1.2212E-05		1.0029E+00	9.9999E-01	4.2520E-03	1.0303E-10
509.	DC2	1.9182E-05	-2.3493E-04		8.4436E-01	1.0002E+00	1.5072E-03	1.0285E-10
510.	RD1	1.9139E-05	-1.2270E-04		1.4925E-01	1.0001E+00	1.4420E-04	1.0263E-10
511.	A3EC8	1.8992E-05	-2.4265E-05		9.6986E-01	1.0000E+00	8.0440E-04	1.0184E-10
512.	HXB3	4.9797E-06	-1.8661E-04		9.6533E-01	1.0002E+00	5.3530E-03	2.6702E-11
513.	RCW1A	8.1924E-07	-2.6170E-06		5.1884E-01	1.0000E+00	5.4390E-06	4.3929E-12
514.	OG51	4.6380E-07	-2.3963E-04		3.8941E-01	1.0002E+00	3.9230E-04	2.4870E-12
515.	ED9	2.6463E-07	-1.8593E-09		1.0000E+00	1.0000E+00	3.7100E-03	1.4190E-12
516.	RPT8	0.0000E+00	-1.2118E-06		9.9614E-01	1.0000E+00	3.1400E-04	0.0000E+00
517.	RQ1	0.0000E+00	-2.9458E-04		1.4171E-01	1.0003E+00	3.4310E-04	0.0000E+00
518.	RPT2	0.0000E+00	-1.4327E-07		9.9877E-01	1.0000E+00	1.1631E-04	0.0000E+00
519.	RPT5	0.0000E+00	-1.4950E-06		9.9982E-01	1.0000E+00	8.1386E-03	0.0000E+00
520.	RR3	0.0000E+00	-1.0126E-05		9.7119E-01	1.0000E+00	3.5140E-04	0.0000E+00
521.	RPD6	0.0000E+00	-3.5718E-05		9.9750E-01	1.0000E+00	1.4090E-02	0.0000E+00
522.	SW2C3	0.0000E+00	-1.9266E-04		9.8366E-01	1.0002E+00	1.1650E-02	0.0000E+00
523.	SW2D2	0.0000E+00	-5.2043E-05		9.9341E-01	1.0001E+00	7.8300E-03	0.0000E+00
524.	SW2C2	0.0000E+00	-5.5224E-05		9.9242E-01	1.0001E+00	7.2310E-03	0.0000E+00
525.	SW1DNN	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
526.	TBB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
527.	SW2D3	0.0000E+00	-2.0622E-04		9.8064E-01	1.0002E+00	1.0540E-02	0.0000E+00
528.	TB0	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
529.	U1NN	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
530.	SW1D12	0.0000E+00	-1.1147E-05		9.9915E-01	1.0000E+00	1.2940E-02	0.0000E+00
531.	SW1D15	0.0000E+00	-1.0111E-05		9.9937E-01	1.0000E+00	1.5910E-02	0.0000E+00
532.	SW1D10	0.0000E+00	-1.1053E-05		9.9996E-01	1.0000E+00	2.0310E-01	0.0000E+00
533.	SW1D9	0.0000E+00	-1.4650E-05		9.9888E-01	1.0000E+00	1.2880E-02	0.0000E+00
534.	SW1D4	0.0000E+00	-4.6669E-06		9.9996E-01	1.0000E+00	9.6230E-02	0.0000E+00
535.	SW1D18	0.0000E+00	-9.7581E-07		9.9991E-01	1.0000E+00	1.1290E-02	0.0000E+00
536.	SW1D3	0.0000E+00	-5.7871E-05		9.9343E-01	1.0001E+00	8.7290E-03	0.0000E+00
537.	SW1CNN	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
538.	UB43A1	0.0000E+00	-1.7588E-04		2.1203E-01	1.0002E+00	2.2316E-04	0.0000E+00
539.	UB43B1	0.0000E+00	-1.8373E-04		2.1203E-01	1.0002E+00	2.3311E-04	0.0000E+00
540.	UB42B4	0.0000E+00	-4.5292E-06		9.7979E-01	1.0000E+00	2.2410E-04	0.0000E+00
541.	UB42B1	0.0000E+00	-1.6727E-04		2.8321E-01	1.0002E+00	2.3330E-04	0.0000E+00
542.	WETS	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
543.	UBREC1	0.0000E+00	-1.9195E-05		9.9766E-01	1.0000E+00	8.1422E-03	0.0000E+00
544.	UBREC3	0.0000E+00	-5.1020E-06		9.9922E-01	1.0000E+00	6.4999E-03	0.0000E+00
545.	U3NN	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
546.	UB41A2	0.0000E+00	-4.5252E-06		9.7979E-01	1.0000E+00	2.2390E-04	0.0000E+00
547.	UB41B1	0.0000E+00	-1.6727E-04		2.8321E-01	1.0002E+00	2.3330E-04	0.0000E+00
548.	UB41A1	0.0000E+00	-1.6727E-04		2.8321E-01	1.0002E+00	2.3330E-04	0.0000E+00
549.	UB42A3	0.0000E+00	-4.5272E-06		9.7979E-01	1.0000E+00	2.2400E-04	0.0000E+00
550.	UB42A1	0.0000E+00	-1.6727E-04		2.8321E-01	1.0002E+00	2.3330E-04	0.0000E+00
551.	UB41B3	0.0000E+00	-7.1452E-07		9.7979E-01	1.0000E+00	3.5360E-05	0.0000E+00
552.	RVD13	0.0000E+00	-6.3919E-08		9.9992E-01	1.0000E+00	8.0480E-04	0.0000E+00
553.	RXS0	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
554.	RXS5	0.0000E+00	-1.2253E-09		9.9994E-01	1.0000E+00	2.1000E-05	0.0000E+00
555.	RX1	0.0000E+00	-5.4847E-04		1.2816E-01	1.0005E+00	6.2870E-04	0.0000E+00
556.	RVOB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
557.	RY3	0.0000E+00	-4.0230E-05		9.3705E-01	1.0000E+00	6.3870E-04	0.0000E+00
558.	RXS7	0.0000E+00	-5.7379E-07		9.7160E-01	1.0000E+00	2.0200E-05	0.0000E+00
559.	RY1	0.0000E+00	-5.3819E-04		1.5829E-01	1.0005E+00	6.3900E-04	0.0000E+00
560.	SDREC1	0.0000E+00	-2.4177E-04		9.2382E-01	1.0002E+00	3.1638E-03	0.0000E+00
561.	RVD18	0.0000E+00	-9.9164E-06		9.8690E-01	1.0000E+00	7.5630E-04	0.0000E+00

MODEL Name: BFNU2M
Split Fraction Importance for Group : ALL
Sorted by Fraction Importance
Group Frequency = 5.3621E-06

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.....	SF Name...	Fraction... Importance	Fussel-Vesely. Importance	Birnbaum... Importance	Achievement. Worth	Reduction... Worth	SF Value.....	Frequency.
562.	RVD21	0.0000E+00	-1.0510E-04		9.7166E-01	1.0001E+00	3.6950E-03	0.0000E+00
563.	RVD17	0.0000E+00	-1.9654E-06		9.9831E-01	1.0000E+00	1.1640E-03	0.0000E+00
564.	RVO1	0.0000E+00	-6.1532E-06		5.3456E-01	1.0000E+00	1.3220E-05	0.0000E+00
565.	RVL1	0.0000E+00	-4.5391E-11		9.9777E-01	1.0000E+00	2.0340E-08	0.0000E+00
566.	RVD38	0.0000E+00	-4.4158E-08		9.9995E-01	1.0000E+00	8.1640E-04	0.0000E+00
567.	RVL0	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
568.	SW1C8	0.0000E+00	-1.1135E-06		9.9993E-01	1.0000E+00	1.4870E-02	0.0000E+00
569.	SPR2	0.0000E+00	-3.2001E-08		9.9996E-01	1.0000E+00	7.4780E-04	0.0000E+00
570.	SPR8	0.0000E+00	-2.1725E-06		9.9566E-01	1.0000E+00	5.0020E-04	0.0000E+00
571.	SPR17	0.0000E+00	-8.6879E-06		9.9204E-01	1.0000E+00	1.0900E-03	0.0000E+00
572.	SPR15	0.0000E+00	-6.8188E-08		9.9987E-01	1.0000E+00	5.3230E-04	0.0000E+00
573.	SW1C2	0.0000E+00	-2.4241E-04		9.7877E-01	1.0002E+00	1.1290E-02	0.0000E+00
574.	SW1ANN	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
575.	SW1BNN	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
576.	SGTOPS	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
577.	SHT22	0.0000E+00	-2.4836E-06		9.7979E-01	1.0000E+00	1.2290E-04	0.0000E+00
578.	SHT27	0.0000E+00	-1.9859E-09		9.9990E-01	1.0000E+00	2.0060E-05	0.0000E+00
579.	SHT21	0.0000E+00	-8.8092E-05		2.8331E-01	1.0001E+00	1.2290E-04	0.0000E+00
580.	SP3	0.0000E+00	-3.9001E-05		9.9549E-01	1.0000E+00	8.5690E-03	0.0000E+00
581.	SP12	0.0000E+00	-1.0509E-04		9.9214E-01	1.0001E+00	1.3190E-02	0.0000E+00
582.	SHUT12	0.0000E+00	-4.9119E-05		9.7979E-01	1.0000E+00	2.4250E-03	0.0000E+00
583.	A3EA1	0.0000E+00	-2.1360E-04		2.1203E-01	1.0002E+00	2.7100E-04	0.0000E+00
584.	DV2B	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
585.	DV29	0.0000E+00	-3.9958E-06		9.9928E-01	1.0000E+00	5.5550E-03	0.0000E+00
586.	DW1	0.0000E+00	-5.1077E-06		9.0907E-01	1.0000E+00	5.6170E-05	0.0000E+00
587.	DV22	0.0000E+00	-6.4068E-06		9.9991E-01	1.0000E+00	6.6070E-02	0.0000E+00
588.	DV27	0.0000E+00	-9.0463E-06		9.9833E-01	1.0000E+00	5.3820E-03	0.0000E+00
589.	DV1B	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
590.	EC8	0.0000E+00	-1.0658E-06		9.9994E-01	1.0000E+00	1.6380E-02	0.0000E+00
591.	EC3	0.0000E+00	-5.4222E-06		9.9857E-01	1.0000E+00	3.7670E-03	0.0000E+00
592.	DW2	0.0000E+00	-9.2096E-06		9.9817E-01	1.0000E+00	5.0086E-03	0.0000E+00
593.	DWP1	0.0000E+00	-2.7891E-05		8.6424E-03	1.0000E+00	2.8133E-05	0.0000E+00
594.	EB3	0.0000E+00	-2.0047E-06		9.9795E-01	1.0000E+00	9.7890E-04	0.0000E+00
595.	EC9	0.0000E+00	-2.1496E-04		9.4260E-01	1.0002E+00	3.7310E-03	0.0000E+00
596.	DN2	0.0000E+00	-2.0525E-05		9.1034E-01	1.0000E+00	2.2887E-04	0.0000E+00
597.	DN1	0.0000E+00	-9.4983E-05		2.1815E-01	1.0001E+00	1.2147E-04	0.0000E+00
598.	DN3	0.0000E+00	-4.9393E-05		9.5547E-01	1.0000E+00	1.1079E-03	0.0000E+00
599.	DL3	0.0000E+00	-1.3181E-04		9.9061E-01	1.0001E+00	1.3840E-02	0.0000E+00
600.	DL5	0.0000E+00	-9.1724E-07		9.9984E-01	1.0000E+00	5.8500E-03	0.0000E+00
601.	DV12	0.0000E+00	-1.0150E-06		9.9988E-01	1.0000E+00	8.4020E-03	0.0000E+00
602.	DT21	0.0000E+00	-3.9972E-06		8.6424E-03	1.0000E+00	4.0320E-06	0.0000E+00
603.	DT11	0.0000E+00	-4.0279E-06		8.6424E-03	1.0000E+00	4.0630E-06	0.0000E+00
604.	DO1	0.0000E+00	-9.5216E-05		2.1623E-01	1.0001E+00	1.2147E-04	0.0000E+00
605.	DO2	0.0000E+00	-1.4690E-05		9.3583E-01	1.0000E+00	2.2887E-04	0.0000E+00
606.	DO3	0.0000E+00	-4.1450E-05		9.6263E-01	1.0000E+00	1.1079E-03	0.0000E+00
607.	DL2	0.0000E+00	-7.2639E-06		9.9622E-01	1.0000E+00	1.9190E-03	0.0000E+00
608.	FWA1	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
609.	FHB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
610.	FWC1	0.0000E+00	-2.5875E-07		9.9701E-01	1.0000E+00	8.6480E-05	0.0000E+00
611.	FGB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
612.	FH3	0.0000E+00	-2.4606E-06		9.9985E-01	1.0000E+00	1.6170E-02	0.0000E+00
613.	FFB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
614.	GDB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
615.	GCB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
616.	GAB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
617.	GBB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
618.	GC10	0.0000E+00	-2.4591E-06		9.9998E-01	1.0000E+00	8.9590E-02	0.0000E+00
619.	ECNN	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
620.	EDNN	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
621.	ED35	0.0000E+00	-1.2102E-05		9.9963E-01	1.0000E+00	3.1360E-02	0.0000E+00
622.	EPR30B	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
623.	ED11	0.0000E+00	-4.8468E-05		9.9980E-01	1.0000E+00	1.9650E-01	0.0000E+00
624.	ED33	0.0000E+00	-2.0655E-05		9.9937E-01	1.0000E+00	3.1640E-02	0.0000E+00
625.	FEB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
626.	FDB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
627.	FCB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
628.	EPR6B	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
629.	FAB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
630.	FBB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
631.	GEB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
632.	AB5	0.0000E+00	-5.0003E-06		9.9345E-01	1.0000E+00	7.6310E-04	0.0000E+00
633.	AB3	0.0000E+00	-2.8383E-09		9.9995E-01	1.0000E+00	5.6460E-05	0.0000E+00
634.	AC13	0.0000E+00	-1.4020E-08		9.9990E-01	1.0000E+00	1.4160E-04	0.0000E+00
635.	A3ED32	0.0000E+00	-2.9697E-05		9.6311E-01	1.0000E+00	8.0440E-04	0.0000E+00
636.	AA2	0.0000E+00	-9.0983E-05		8.8086E-01	1.0001E+00	7.6310E-04	0.0000E+00
637.	A3ED27	0.0000E+00	-3.5689E-06		9.9991E-01	1.0000E+00	3.7330E-02	0.0000E+00
638.	AD22	0.0000E+00	-1.4020E-08		9.9990E-01	1.0000E+00	1.4160E-04	0.0000E+00
639.	ACM3	0.0000E+00	-1.0864E-06		4.5680E-01	1.0000E+00	2.0000E-06	0.0000E+00
640.	AC5	0.0000E+00	-2.1844E-07		9.9613E-01	1.0000E+00	5.6460E-05	0.0000E+00
641.	ACM1	0.0000E+00	-4.6142E-05		7.6933E-01	1.0000E+00	2.0000E-04	0.0000E+00
642.	ACM2	0.0000E+00	-5.1199E-06		8.9761E-01	1.0000E+00	5.0000E-05	0.0000E+00

.....	SF Name...	Fraction... Importance	Fussel-Vesely. Importance	Birnbaum... Importance	Achievement. Worth	Reduction... Worth	SF Value.....	Frequency.
643.	AD27	0.0000E+00	-2.3004E-06		9.9995E-01	1.0000E+00	4.4860E-02	0.0000E+00
644.	A3EB19	0.0000E+00	-7.3647E-07		9.9998E-01	1.0000E+00	3.7330E-02	0.0000E+00
645.	A3EB18	0.0000E+00	-9.2363E-07		9.9998E-01	1.0000E+00	3.7330E-02	0.0000E+00
646.	A3EB23	0.0000E+00	-2.1603E-05		9.7317E-01	1.0000E+00	8.0440E-04	0.0000E+00
647.	A3EB1	0.0000E+00	-1.9830E-04		2.1203E-01	1.0002E+00	2.5160E-04	0.0000E+00
648.	A3EB17	0.0000E+00	-3.5627E-05		9.5407E-01	1.0000E+00	7.7500E-04	0.0000E+00
649.	A3ED10	0.0000E+00	-5.5776E-07		9.9998E-01	1.0000E+00	2.8530E-02	0.0000E+00
650.	A3ED1	0.0000E+00	-1.6764E-04		2.1203E-01	1.0002E+00	2.1270E-04	0.0000E+00
651.	A3EC9	0.0000E+00	-5.7290E-06		9.9993E-01	1.0000E+00	7.5810E-02	0.0000E+00
652.	A3EB25	0.0000E+00	-4.8778E-06		9.9440E-01	1.0000E+00	8.6970E-04	0.0000E+00
653.	A3EC1	0.0000E+00	-2.1368E-04		2.1203E-01	1.0002E+00	2.7110E-04	0.0000E+00
654.	A3EC10	0.0000E+00	-5.4732E-05		9.3712E-01	1.0001E+00	8.6970E-04	0.0000E+00
655.	DJ3	0.0000E+00	-1.4497E-06		9.9990E-01	1.0000E+00	1.4780E-02	0.0000E+00
656.	DGO	0.0000E+00	-2.5982E-08		9.9997E-01	1.0000E+00	8.0670E-04	0.0000E+00
657.	DGN	0.0000E+00	-2.4101E-05		9.5621E-01	1.0000E+00	5.5010E-04	0.0000E+00
658.	DGP	0.0000E+00	-4.0980E-05		9.2555E-01	1.0000E+00	5.5010E-04	0.0000E+00
659.	DGE	0.0000E+00	-3.2025E-06		9.9929E-01	1.0000E+00	4.4730E-03	0.0000E+00
660.	DGH	0.0000E+00	-2.4011E-06		9.9947E-01	1.0000E+00	4.4720E-03	0.0000E+00
661.	DGCS	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
662.	DJ2	0.0000E+00	-3.3805E-06		9.9977E-01	1.0000E+00	1.4710E-02	0.0000E+00
663.	DI3	0.0000E+00	-2.1395E-06		9.9990E-01	1.0000E+00	2.1660E-02	0.0000E+00
664.	DH2	0.0000E+00	-2.5291E-06		9.9943E-01	1.0000E+00	4.4120E-03	0.0000E+00
665.	DI1	0.0000E+00	-5.0142E-04		8.9655E-03	1.0005E+00	5.0570E-04	0.0000E+00
666.	DI2	0.0000E+00	-3.3385E-06		9.9977E-01	1.0000E+00	1.4530E-02	0.0000E+00
667.	AD34	0.0000E+00	-2.1689E-06		9.9998E-01	1.0000E+00	8.6230E-02	0.0000E+00
668.	CD2	0.0000E+00	-8.7580E-07		9.9930E-01	1.0000E+00	1.2559E-03	0.0000E+00
669.	CAD2	0.0000E+00	-2.0875E-04		9.1881E-01	1.0002E+00	2.5645E-03	0.0000E+00
670.	CDA1	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
671.	AD4	0.0000E+00	-2.7076E-05		9.5796E-01	1.0000E+00	6.4360E-04	0.0000E+00
672.	CAD1	0.0000E+00	-4.4551E-06		8.8275E-01	1.0000E+00	3.7995E-05	0.0000E+00
673.	DGC	0.0000E+00	-1.8184E-07		9.9996E-01	1.0000E+00	4.9990E-03	0.0000E+00
674.	DCA2	0.0000E+00	-1.3687E-04		9.9411E-01	1.0001E+00	2.2722E-02	0.0000E+00
675.	CST1	0.0000E+00	-2.9359E-06		8.7618E-03	1.0000E+00	2.9618E-06	0.0000E+00
676.	CIL1	0.0000E+00	-2.8529E-06		2.2071E-01	1.0000E+00	3.6609E-06	0.0000E+00
677.	CIL2	0.0000E+00	-1.1872E-04		7.8793E-01	1.0001E+00	5.5952E-04	0.0000E+00
678.	CS6	0.0000E+00	-1.5219E-06		9.9847E-01	1.0000E+00	9.9380E-04	0.0000E+00
679.	RP1	0.0000E+00	-2.3221E-04		9.5345E-02	1.0002E+00	2.5662E-04	0.0000E+00
680.	OHL2	0.0000E+00	-1.6734E-06		9.9963E-01	1.0000E+00	4.4930E-03	0.0000E+00
681.	OHC3	0.0000E+00	-1.6309E-05		9.7785E-01	1.0000E+00	7.3590E-04	0.0000E+00
682.	OHS1	0.0000E+00	-1.2260E-04		9.8558E-01	1.0001E+00	8.4290E-03	0.0000E+00
683.	OHC1	0.0000E+00	-2.5102E-04		7.6366E-01	1.0003E+00	1.0610E-03	0.0000E+00
684.	OHC2	0.0000E+00	-2.1320E-05		9.7678E-01	1.0000E+00	9.1750E-04	0.0000E+00
685.	OFT1	0.0000E+00	-5.4460E-06		9.9701E-01	1.0000E+00	1.8170E-03	0.0000E+00
686.	OPTR1	0.0000E+00	-3.7927E-05		9.8002E-01	1.0000E+00	1.8950E-03	0.0000E+00
687.	OLP2	0.0000E+00	-5.9521E-06		8.4018E-01	1.0000E+00	3.7240E-05	0.0000E+00
688.	OHS2	0.0000E+00	-3.6463E-04		5.3717E-01	1.0004E+00	7.8720E-04	0.0000E+00
689.	OIV1	0.0000E+00	-1.3957E-04		9.3819E-01	1.0001E+00	2.2530E-03	0.0000E+00
690.	OLC2	0.0000E+00	-1.2112E-04		8.1190E-01	1.0001E+00	6.4350E-04	0.0000E+00
691.	ORF1	0.0000E+00	-3.1761E-05		6.8102E-01	1.0000E+00	9.9560E-05	0.0000E+00
692.	NRUB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
693.	NPII1	0.0000E+00	-2.5082E-04		6.3999E-02	1.0003E+00	2.6790E-04	0.0000E+00
694.	NRV0	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
695.	NH23	0.0000E+00	-5.0145E-06		9.9834E-01	1.0000E+00	3.0130E-03	0.0000E+00
696.	NIEB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
697.	OF1	0.0000E+00	-1.1240E-06		9.9707E-01	1.0000E+00	3.8410E-04	0.0000E+00
698.	OEEB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
699.	OEE1	0.0000E+00	-3.8377E-06		9.9263E-01	1.0000E+00	5.2010E-04	0.0000E+00
700.	OBC1	0.0000E+00	-2.4176E-05		9.6955E-01	1.0000E+00	7.9338E-04	0.0000E+00
701.	OBD2	0.0000E+00	-2.0628E-08		9.9997E-01	1.0000E+00	7.9588E-04	0.0000E+00
702.	ODSBB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
703.	NH22	0.0000E+00	-5.1672E-06		9.9966E-01	1.0000E+00	1.5050E-02	0.0000E+00
704.	RK2	0.0000E+00	-3.1095E-05		9.6943E-01	1.0000E+00	1.0160E-03	0.0000E+00
705.	RF1	0.0000E+00	-2.2270E-04		1.7853E-01	1.0002E+00	2.7103E-04	0.0000E+00
706.	RL2	0.0000E+00	-6.1950E-09		9.9996E-01	1.0000E+00	1.5230E-04	0.0000E+00
707.	RCW9	0.0000E+00	-1.2898E-09		9.9995E-01	1.0000E+00	2.5658E-05	0.0000E+00
708.	RE1	0.0000E+00	-2.3268E-04		1.4171E-01	1.0002E+00	2.7103E-04	0.0000E+00
709.	RCW2A	0.0000E+00	-1.7561E-08		9.9930E-01	1.0000E+00	2.5213E-05	0.0000E+00
710.	RO1	0.0000E+00	-2.3636E-04		1.2816E-01	1.0002E+00	2.7103E-04	0.0000E+00
711.	RN1	0.0000E+00	-2.9154E-04		1.5044E-01	1.0003E+00	3.4305E-04	0.0000E+00
712.	RL4	0.0000E+00	-5.2621E-05		9.4831E-01	1.0001E+00	1.0170E-03	0.0000E+00
713.	RL5	0.0000E+00	-4.3286E-07		9.9956E-01	1.0000E+00	9.7800E-04	0.0000E+00
714.	RM1	0.0000E+00	-2.9454E-04		1.4171E-01	1.0003E+00	3.4305E-04	0.0000E+00
715.	OSD2	0.0000E+00	-7.7803E-06		9.9450E-01	1.0000E+00	1.4130E-03	0.0000E+00
716.	R4801	0.0000E+00	-1.1790E-04		8.9095E-01	1.0001E+00	1.0800E-03	0.0000E+00
717.	PCA4	0.0000E+00	-1.1226E-04		9.9751E-01	1.0001E+00	4.3080E-02	0.0000E+00
718.	R480B	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
719.	OSWNN	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
720.	OUBNN	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
721.	RCL2	0.0000E+00	-3.7960E-05		9.9968E-01	1.0000E+00	1.0700E-01	0.0000E+00
722.	RBISOS	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
723.	RBCS	0.0000E+00	-5.5886E-05		9.8784E-01	1.0001E+00	4.5736E-03	0.0000E+00

APPENDIX D. ϕ-M MATRIX

Table D-1 presents the ϕ-M matrix for the Browns Ferry Unit 2 PSA.

MODEL Name: BFNU2M
Split Fraction Importance for Group : ALL
Sorted by Fraction Importance
Group Frequency = 5.3621E-06

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.....	SF Name...	Fraction... Importance	Fussel-Vesely. Importance	Birnbaum... Importance	Achievement. Worth	Reduction... Worth	SF Value.....	Frequency.
724.	RBCI	0.0000E+00	-2.5674E-05		9.9973E-01	1.0000E+00	8.6537E-02	0.0000E+00
725.	RBCK	0.0000E+00	-2.7288E-05		9.9442E-01	1.0000E+00	4.8676E-03	0.0000E+00
726.	RBCL	0.0000E+00	-5.5967E-05		9.9592E-01	1.0001E+00	1.3528E-02	0.0000E+00
727.	GFB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
728.	HXD5	0.0000E+00	-5.0133E-05		9.9979E-01	1.0001E+00	1.9470E-01	0.0000E+00
729.	HXD4	0.0000E+00	-1.0614E-07		1.0000E+00	1.0000E+00	2.0870E-02	0.0000E+00
730.	HXD8	0.0000E+00	-1.6835E-04		9.6872E-01	1.0002E+00	5.3530E-03	0.0000E+00
731.	HXB2	0.0000E+00	-5.0545E-05		9.9763E-01	1.0001E+00	2.0870E-02	0.0000E+00
732.	HXC3	0.0000E+00	-7.1407E-05		9.8706E-01	1.0001E+00	5.4880E-03	0.0000E+00
733.	HUM3	0.0000E+00	-4.6424E-05		9.0356E-01	1.0000E+00	4.8115E-04	0.0000E+00
734.	INES	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
735.	INDS	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
736.	HXD9	0.0000E+00	-1.8679E-05		9.9939E-01	1.0000E+00	2.9850E-02	0.0000E+00
737.	INAS	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
738.	INBS	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
739.	INFS	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
740.	HPL2	0.0000E+00	-2.8385E-05		9.9968E-01	1.0000E+00	8.2230E-02	0.0000E+00
741.	GHB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
742.	HPL6	0.0000E+00	-5.2102E-06		9.9995E-01	1.0000E+00	8.8030E-02	0.0000E+00
743.	GGB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
744.	GH6	0.0000E+00	-2.3145E-05		9.9985E-01	1.0000E+00	1.3390E-01	0.0000E+00
745.	HUM2	0.0000E+00	-4.8071E-08		9.9988E-01	1.0000E+00	4.1140E-04	0.0000E+00
746.	HUM1	0.0000E+00	-5.2142E-04		2.7910E-01	1.0005E+00	7.2277E-04	0.0000E+00
747.	HS0	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
748.	HR60	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
749.	HRC6	0.0000E+00	-1.3590E-06		9.9983E-01	1.0000E+00	8.1246E-03	0.0000E+00
750.	HRL0	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
751.	NBOCB	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
752.	LFS	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
753.	LECS	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
754.	LM1	0.0000E+00	-4.6797E-05		8.6424E-03	1.0000E+00	4.7203E-05	0.0000E+00
755.	L8H3	0.0000E+00	-1.8722E-06		9.9989E-01	1.0000E+00	1.6761E-02	0.0000E+00
756.	L8TR1	0.0000E+00	-3.9305E-05		9.9428E-01	1.0000E+00	6.8250E-03	0.0000E+00
757.	L8H2	0.0000E+00	-1.5084E-06		9.9987E-01	1.0000E+00	1.1431E-02	0.0000E+00
758.	NA0	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
759.	MSVC1	0.0000E+00	-4.4068E-07		9.9428E-01	1.0000E+00	7.7040E-05	0.0000E+00
760.	LPRESS	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
761.	LV3	0.0000E+00	-1.2357E-05		9.9707E-01	1.0000E+00	4.2033E-03	0.0000E+00
762.	LVP1	0.0000E+00	-2.8248E-05		8.6424E-03	1.0000E+00	2.8493E-05	0.0000E+00
763.	INGS	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
764.	IVC3	0.0000E+00	-6.6980E-08		9.9868E-01	1.0000E+00	5.0853E-05	0.0000E+00
765.	IVC2	0.0000E+00	-2.9574E-07		9.9462E-01	1.0000E+00	5.4966E-05	0.0000E+00
766.	IVO1	0.0000E+00	-3.4521E-15		4.7100E-01	1.0000E+00	6.5257E-15	0.0000E+00
767.	INHS	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
768.	ISO1	0.0000E+00	-5.8955E-08		9.9973E-01	1.0000E+00	2.2218E-04	0.0000E+00
769.	KHS	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
770.	KFS	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
771.	KCS	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
772.	JAS	0.0000E+00				1.0000E+00	0.0000E+00	0.0000E+00
773.	JC2	0.0000E+00	-5.3954E-07		9.9801E-01	1.0000E+00	2.7120E-04	0.0000E+00

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4. MODIFICATIONS MADE TO PREVIOUS PRA MODELS

The modifications made to the PSA models are presented in this section. Changes made to the initiating event analysis (incorporating new initiating events or refining the frequency of selected initiators) are presented in Section 4.1. Changes made to systems analyses or the event models are presented in Section 4.2. The assessment of new operator actions is summarized in Section 4.3.

4.1 INITIATING EVENTS

4.1.1 REFINEMENT OF MODEL FOR FLOODS IN THE TURBINE BUILDING

In the previous PRA models, a single initiator was used to represent all potential flooding events in the turbine building. In the current model, two initiators are developed to represent the spectrum of potential flooding events, resulting in a more realistic representation.

The turbine building flood initiating event frequency used in the IPE, Rev. 1 I.O. #2 PRA, and Multi-Unit PRA was developed from industry flooding experience. The associated flooding events database (Reference 5) covers a total of 740 years of reactor power operation, which is approximately 1,081 calendar years. The flooding events were screened to include only large flooding incidents in the turbine building. Of the 28 flooding events in the database, 11 events were found to be applicable to the original analyses.

In the current evaluation of risk for the plant configuration in which Units 2 and 3 are returned to service and Unit 1 is in extended layup, the 11 applicable turbine building flooding events were reexamined together with the BFN turbine building layout in order to determine the more realistic flooding scenario(s) that can occur in the turbine building. The following items summarize the findings of the reexamination of the BFN turbine building layout and the applicable flooding events:

- The raw cooling water (RCW) pumps for Units 1 and 2 are installed in one room and the Unit 3 RCW pumps are installed in a separate room about 50 ft away. These rooms are isolated from the general condenser area by a solid wall to the south and walls with doors to the east and west. The walls are about 8-ft high. The RCW pumps are mounted approximately 18 (bottom) to 48 (top) inches above the floor.

- The compressors for the plant control air system are located at Elevation 565'. Equipment associated with the feedwater and condensate systems are located on the basement floor of the turbine building at Elevation 557'.

- The general floor area in the turbine building for the condenser areas at Elevation 557' are estimated as approximately 40,000 ft^2 for the Units 1 and 2 areas and 28,000 ft^2 for the Unit 3 area, or about 68,000 ft^2 total floor area. No significant holdup that would contain a flood to one condenser area or another was identified. At 7.8 gallons per cubic foot of water and assuming an available volume of 50% (i.e., equipment and

foundations occupy half the volumetric space) in the condenser areas of the turbine building, an estimated 265,000 gallons of water are required to cover the area up to 12 inches deep.

- If it is assumed that the RCW pumps are not impacted by a flood in the general area of the turbine building until the water level in the area is at least 18 inches high and there is in-leakage into the RCW pump room through the normally closed doors, it would require a flood involving at least 400,000 gallons of water to fail the RCW pumps.

- Most of the applicable turbine flooding events do not involve a flood of this magnitude (400,000 gallons) or have the potential to cause a flood of this magnitude.

Based on the above findings, two turbine building flood initiating events were defined and analyzed. The first initiating event FLTB involved a very large flood that is severe enough to fail the feedwater system, condensate system, RCW system, and plant control air system. The second turbine building flood initiating event FLTB2 is less severe and fails only the feedwater and condensate systems.

Table 4-1 shows the 11 flooding events applicable to the BFN turbine building flooding analysis. The events were rescreened for the calculation of the frequencies for the two initiating events defined for this study. A two-stage Bayesian method was used to construct the prior distribution for the two turbine flooding frequencies and then updated with plant-specific experience of zero events in 1.69 years of operation. The updated mean turbine building flood frequency for initiating event FLTB is 1.10E-03 per year, and 7.20E-03 per year for initiating event FLTB2. These initiating event frequencies are for a single unit.

The BFN turbine building is common to all three units, and, therefore, events at one unit during shutdown or at power could impact the other unit. For this study, Unit 1 is in extended layup and the Unit 1 systems that are potential flood sources in the turbine building, such as the circulating water system, are idle. Only the operating equipment and systems associated with Units 2 and 3 could cause a flooding event in the turbine building. The frequency of the initiating event is, therefore, estimated as two times the frequency for a single unit; that is, 2.20E-03 per year for FLTB, and 1.44E-02 per year for FLTB2.

4.1.2 LOSS OF OFFSITE POWER

Loss of offsite power as an initiator is represented by two distinct initiators: total loss of offsite power, meaning loss of all of the 500-kV and 161-kV supplies; and loss of only the 500-kV supply. In turn, two classes of loss of 500-kV power were identified: loss of 500-kV to a single unit (L500U2) and loss of 500-kV to the plant (L500PA). The frequency for the loss of all offsite power remains at 3.39E-02 per year. The frequencies for the initiators L500U2 and L500PA are 4.47E-02 and 3.59E-02 per year, respectively.

The conditional likelihood of losing the grid following a multiple unit initiator was taken from the Multi-Unit PRA.

4.1.3 LOSS OF REACTOR BUILDING CLOSED COOLING WATER SYSTEM

The frequency for the loss of the reactor building closed cooling water was included in the updated systems analysis that reflects the plant configuration being modeled. That analysis concluded the frequency of this initiator is 8.87E-02 per year. The plant response logic model for the loss of the reactor building closed cooling water system developed in the Multi-Unit PRA is applicable and was adopted.

4.1.4 LOSS OF PLANT AIR

A reexamination of the frequency for the Loss of Plant Air initiating event resulted in a value of 5.30E-02 per year. The reexamination of this frequency assumed an 80% availability factor. As part of the reexamination of the initiating event frequency, a review of a recent plant modification was made. That modification involves the ability to isolate the air header on a unit if a header break were to occur so that the other unit would be unaffected. The evidence that was used to determine the initiating event frequency was taken from industry experience. That experience indicates that the dominate causes of system failure are failures of compressor or dryer units. While the plant modification does result in a lower incidence of loss of plant air, the reduction is not quantitatively significant. This finding is supported by the plant air systems analysis.

4.1.5 FLOODS IN THE INTAKE PUMPING STATION

A review of the analysis of the frequency of floods in the intake pumping station for the plant configuration of interest resulted in the determination that the frequency used in the previous PRAs is applicable.

4.2 SYSTEMS ANALYSES AND EVENT MODEL

4.2.1 MODIFICATIONS IN MODELING OF BATTERY BOARD AVAILABILITY

The model was changed to reflect the transfer of loads when a battery board is removed for maintenance. In addition, the model was changed to restrict maintenance to a single battery board as reflected by actual plant practices; the earlier models contained terms that corresponded to simultaneous maintenance on battery boards 2 and 3 that did not correspond to actual plant practices.

The availability of battery boards 1, 2, and 3 is represented in the event model by Top Events DE, DH, and DG, respectively, found in the electric power support event trees (ELECT12 and ELECT3).

To ensure a contribution from simultaneous maintenance of battery boards 2 and 3 to the unavailability of both the battery boards does not occur, an intermediate top event fault tree model representing of the two battery boards was constructed using the existing individual battery board fault tree models. Only top event alignments for the removal of one of the battery boards for maintenance were defined. This top event model, therefore, determines the

unavailability of the two battery boards due to hardware failure of both battery boards; hardware failure of battery board 2 and maintenance of battery board 3; and hardware failure of battery board 3 and maintenance of battery board 2. In addition, the intermediate top event also calculates the unavailability of an individual battery board due to all causes. The conditional split fractions for Top Events DH and DG are defined in terms of the unavailabilities or split fractions for battery boards 2 and 3 evaluated from the intermediate top event model. These split fractions are used in the plant model quantification for event sequences in which battery board 1 (Top Event DE) is unavailable.

To model the shifting of the loads from battery board 2 or 3 to battery board 1 when the battery board 2 or 3 is taken out of service for maintenance purpose, a new set of intermediate and conditional split fractions for Top Events DH and DG were defined. The new split fractions or unavailabilities do not contain any contributions from maintenance activities for battery boards 2 and 3. Only contributions from hardware failures are included in these new split fractions. The split fractions are used in the plant model quantification for event sequences in which battery board 1 is available. This implies that when battery board 1 is available, battery boards 2 and 3 can only be unavailable due to hardware failures. Maintenance of battery board 2 or 3 does not contribute to the unavailability of Top Event DH or DG for event sequences in which battery board 1 (Top Event DE) is available due to the shifting of the loads from the battery board 2 or 3 to battery board 1. However, for event sequences in which battery board 1 is not available, then maintenance contribution to the unavailability of battery boards 2 and/or 3 will be included.

4.2.2 CHANGES IN THE MODEL FOR RAW COOLING WATER

The success criteria for RCW has been changed to reflect that two pumps are sufficient to support one unit and that any four pumps are sufficient to support Units 2 and 3.

A new split fraction, R3CW1, was developed using the RCW pumps from all three units. The top event name used in the System Analysis Module of RISKMAN® for the three unit RCW model is R3CW. The success criteria used for Top Event R3CW is that 4 of 10 pumps are required to operate for 24 hours. (As discussed below, one of the seven Unit 1/Unit 2 RCW pumps and one of the five Unit 3 RCW pumps are assumed to be in standby and used for maintenance replacement of normally running pumps.) The actual system model requires that at least two of the four Unit 3 pumps modeled and at least two of the six Units 1 and 2 pumps are available.

The combinations of failures in the fault tree are limited to failure of all four Unit 3 pumps with coincident failure of three Units 1 and 2 pumps or failure of all six Units 1 and 2 pumps combined with failure of any one Unit 3 pump. The combinations of global common cause failure of one group of pumps with coincident failure of pumps in the other group dominate the contribution from pump failures. Even so, the overall contribution of pump failures to split fraction R3CW1 is relatively small. The six Units 1 and 2 pumps are grouped into one common cause group and the four Unit 3 pumps are grouped into another common cause group.

The R3CW model assumes that the flow paths for Units 2 and 3 are both required to be available for the mission time. This assumption leads to several single order cutsets for manual valves transferring closed. These cutsets are the major contributors to failure of split fraction R3CW1.

Pumps 1D and 3E were assumed to be spares used only for maintenance alignments and do not appear in the three unit fault tree for RCW. Therefore, no maintenance alignments were modeled for the RCW pumps, only for the strainers. The other 10 pumps from the 3 units are included in the fault tree used to develop split fraction R3CW1. Split fraction R3CW1 is only used when the support for all of the 10 pumps modeled in the fault tree is available.

Four RCW pumps are required to support both Units 2 and 3. A modeling assumption is made in order to avoid an unnecessarily complex model. The four required pumps can be all from Units 1 and 2, all from Unit 3, or from a combination of both sets. The model, however, only takes credit for Unit 3 pumps if three of the six running Unit 1/Unit 2 pumps fail. This assumption greatly simplifies the RCW model and is shown (by the low RCW importance) to not affect the quantitative results.

4.2.3 CONSIDERATION OF THE DIESEL-DRIVEN FIRE PUMP TO PROVIDE VESSEL LEVEL CONTROL

Currently, the diesel-driven fire pump is not credited for providing sufficient makeup to the vessel.

4.2.4 CONTROL ROD DRIVE HYDRAULIC SYSTEM

In the current model, CRD pump 1B, nominally shared between Units 1 and 2, is assumed to be permanently assigned to support Unit 2. CRD pump 1B would, therefore, be available to replace pump 2A when the latter is in maintenance, and is potentially available to work with pump 2A to provide enhanced CRD flow per EOI Appendix 5B. Also, an additional split fraction was developed to represent the local recovery of enhanced flow from the CRD hydraulic system following failure of unit preferred power and loss of plant air.

In a related activity, a review of the model developed for the CRD pump unavailability revealed that the generic maintenance distributions used in the analysis were overly conservative when compared to actual maintenance unavailabilities experienced for pumps 1B and 2A since the restart of Unit 2. More appropriate generic distributions were adopted resulting in a more realistic CRD model.

4.2.5 ROLE OF RBCCW PUMP AND HEAT EXCHANGER 1C

RBCCW pump and heat exchanger 1C can be utilized by either Unit 2 or 3. The model has been updated to reflect the shared nature of these components and to take credit for them during pump or heat exchanger maintenance.

4.2.6 USE OF UNIT 3 DIESEL GENERATORS TO SUPPORT UNIT 2

Credit is taken for the Unit 3 diesel generator 3ED to support Unit 2 only in selected scenarios. Specifically, the possibility of utilizing diesel generator 3ED to support Unit 2 is considered if at least two other Unit 3 diesel generators are available to support Unit 3.

4.2.7 LONG-TERM OPERATION OF HPCI OR RCIC

If high pressure coolant injection (HPCI) or reactor core isolation cooling (RCIC) are taking suction from the suppression pool, then suppression pool cooling is required to ensure their long-term operation. The event model structure developed for the IPE included logic representing actions to ensure long-term operation of HPCI or RCIC given suppression pool cooling failure. The specific actions involve transferring the suction of these pumps back to the condensate storage tank (CST) (or ensuring that RCIC remains aligned from the CST) and providing makeup to the CST. The associated hardware and operator actions are represented in the low pressure general transient event tree (LPGTET) as Top Events HR and OHR, respectively. In previous models, no credit was taken for these actions; in the current model, the possibility of recovery is considered for non-ATWS cases in which either HPCI or RCIC hardware availability has been ensured for 24 hours.

4.2.8 USE OF UNIT 1 DIVISION II RHR PUMPS TO SUPPORT UNIT 2 AND USE OF UNIT 3 DIVISION I PUMPS TO SUPPORT UNIT 2

The current model includes consideration of the Unit 1 division II RHR pumps as being dedicated to support Unit 2. This feature is represented in the low pressure general transient event tree (LPGTET) as Top Event U1.

For selected scenarios (specifically, for events involving only Unit 2), Unit 3 division I pumps can support Unit 2. Likewise, division II pumps from Unit 2 can support Unit 3 in selected scenarios.

4.2.9 TRANSFER OF POWER AT THE 480V SHUTDOWN BOARDS 2A AND 2B; 250V RMOV BOARDS 2A AND 2B

Transfer of power for selected boards is represented by Top Event R480 in the low pressure general transient event tree (LPGTET). The modeling of this top event refines the approach taken earlier.

4.2.10 RHRSW AND EECW REQUIREMENTS FOR TWO-UNIT OPERATION

The current model requires one RHRSW pump per unit for successful heat removal. For two-unit events, two RHRSW or swing pumps not in the same room can be used to support both units. For ATWS conditions, four RHRSW pumps (and four RHR pumps/heat exchangers) are required. Two EECW pumps are required with the restriction that both cannot be in the same room. Details are provided in Table 3-4.

4.2.11 RECOVERY OF BOP EQUIPMENT FOLLOWING SELECTED INITIATING EVENTS

For selected scenarios that initially involve isolation of the reactor vessel, the possibility is considered that the main condenser can be recovered. This recovery is reflected in the event model via split fractions developed for Top Event HS in the low pressure general transient event tree (LPGTET).

The information used to develop a basis for the recovery models came from two sources. The first source was a review of pre-1985 operating experience at BFN. The plant response as reported in the operator's logs following selected initiators was reviewed to determine whether an attempt to restart the plant occurred within approximately 4 hours of the original initiator. The choice of 4 hours is consistent with the 6-hour mission time for the initial phase of HPCI/RCIC operation. If restart is not successful, the additional 2 hours of HPCI/RCIC operation would support cooldown activities. Such actions were interpreted as evidence that the balance-of-plant (BOP) equipment had been recovered. Data of this form were available for MSIV Closure, Loss of Condenser Vacuum, Turbine Trip without Bypass, Loss of Feedwater, and Loss of Plant Air initiators. Events from the operating log that resulted in an unrelated shutdown were excluded from consideration.

A second source of data was required to support the recovery of BOP following loss of offsite power. This information was adopted from the Peach Bottom analysis of NUREG/CR-4550 (Reference 6).

For loss of offsite power scenarios, recovery is considered if scram was successful, HPCI or RCIC was determined to be available, and if power was restored within 30 minutes. For the transient initiators Loss of Condenser Vacuum, Partial Loss of Condensate, Loss of Condensate, Partial Loss of Feedwater, Loss of Feedwater, MSIV Closure, Loss of Plant Air, Pressure Regulator Failure, and Turbine Trip without Bypass, the possibility of recovery is considered given successful scram and the availability of HPCI or RCIC.

In summary, the likelihood of successful recovery of BOP under the conditions described above was determined to be characterized by the following mean values:

Initiator	Mean Value
MSIV Closure	0.943
Loss of Condenser Vacuum	0.915
Turbine Trip without Bypass	0.858
Loss of Feedwater	0.700
Loss of Plant Air	0.874
Loss of Offsite Power	0.910

Additional details on these likelihoods are reported in Table A-2 of Appendix A.

4.2.12 LOCAL OPERATION OF THE HARDENED WETWELL VENT

For selected scenarios, which include station blackout conditions, local operation of the wetwell vent is considered.

4.2.13 OPERATION OF 2-INCH PRIMARY CONTAINMENT VENT LINES IN ACCORDANCE WITH EMERGENCY OPERATING INSTRUCTIONS

The valves in question were previously included in the event tree Top Event CIS (found in the containment interface event tree CNTMT). In previous models, these vent lines were assumed to initially be open and were required to close on receipt of an isolation signal. The current model augments this requirement by recognizing that, per procedure, the isolation signals might be bypassed, and therefore the valves will require manual action to close.

4.2.14 OTHER MODEL MODIFICATIONS

Other modifications made to the models include the consideration of recovery of support for diesel generator C given failure of diesel generators A, B, and D, and the addition of two top events that designate whether a core damage event has occurred on the adjacent unit and whether Unit 3 is at power, respectively.

The diesel generator auxiliary board, required for local ventilation/cooling of the diesel generator rooms, can be powered from diesel generator A, B, or D. Without the consideration of recovery, diesel generator C would have to be assumed to fail if diesel generators A, B, and D were determined to be unavailable. The potential for recovery is rather modest due to the common cause model linking the four diesel generators; however, recovery is possible by local actions to provide power to the necessary auxiliary board. The possibility for recovery was added to the event model by the addition of a new top event (ODSB) in the electric power support event tree (ELECT12).

A similar dependency exists for diesel generator 3ED on diesel generators 3EA, 3EB, and 3EC. Recovery of diesel generator 3ED has not yet been considered. (Recovery of diesel generator 3ED is considered in the Unit 3 PSA).

Two new top events were added to the signal event tree (SIGL). The first top event (ACM) represents the likelihood that a core damage event is occurring on the adjacent unit; a similar top event was used in the Multi-Unit PRA. This top event acts as a flag that signals when access to the reactor building is not possible. The second top event (U3AP) determines the status (at power/shutdown) of Unit 3 and is used to flag different sets of conditional availability of Unit 3 equipment to support Unit 2.

Other modeling changes were incorporated to enhance the efficiency of the quantification process. These changes included the elimination of the three top events (MT1, MT2, and MT3) in the ELECT12 tree that represented the three main transformers, respectively.

These top events were replaced by macros, thereby decreasing the quantification time with no significant impact on the fidelity of the model. Likewise, in the SIGL tree, the four ECCS vessel level top events (LT1, LT2, LT3, and LT4) were eliminated by incorporating their underlying logic into the existing Top Event LV. In addition, the four PCIS vessel level top events (LM1, LM2, LM3, and LM4) were combined into a single new Top Event LM.

The rules for the selection of Top Event NCD in the CNTMT event tree reflect the logic that specifies whether core damage is averted in a particular sequence. For this model, the rules for NCD that evolved through the previous PRAs were reviewed and simplified.

4.3 OPERATOR ACTIONS

The actions described below were incorporated into the plant model to address various issues. They have either been quantified utilizing input from operators in the past or are sufficiently similar to other actions in terms of influences on performance-shaping factors to justify assignment of a surrogate distribution for this quantification. This section discusses the context in which each action was evaluated and presents the resultant human error rates.

- **Operator Action HOCIS2 — Close Containment Vent System Valves, Given Radiation Indications Exceed Allowable Limits.** Action HOCIS2 has been established in recognition that when a transient occurs, the operators are directed by EOI-2 PC/P-1 to monitor and control pressure below 2.4 psig using the vent system. The vent is established by manipulating keylock switch 2-HS-84-20(19), which overrides the Group 6 isolation signal. Therefore, if EOI PC/P-1 is being executed when core damage occurs, the vent path must be manually closed to avoid a bypass of containment, resulting in failure of Top Event CIS, "Containment Penetration 3 Inches or Less in Diameter."

  Action HOCIS2 involves the termination of an active process directed by the emergency operating instructions (EOI) when the conditions that permit the process are violated.

- **Operator Action HOCRD3 — Establish CRD Enhanced Flow Injection to RPV Locally, Given Loss of UPS or Loss of Plant Air.** Action HOCRD3 has been established to take credit for the fact that operators can manually align CRD to provide enhanced flow injection to the RPV if the capability to accomplish this action from the control room is lost due to loss unit preferred 120V AC. The split fraction CRD5 has been added to Top Event CRD in the low pressure general transient event tree (LPGTET) to represent the early establishment of enhanced CRD flow given failure of UPS.

  The local manual steps required to align and adjust 2-FCV-85-11A(B) using 2-PCV-85-11 are clearly delineated in 2-OI-85, Section 8.24.3. Moreover, the operator has easy access to the controls and, in the absence of a LOCA or ATWS, ample time to perform the actions due to the inventory of water available in the RPV to remove decay heat.

The same action was determined to be applicable to Loss of Plant Air scenarios.

- **Operator Action HOHR1 — Transfer HPCI/RCIC Suction to CST and Maintain CST Level, Given Suppression Pool Cooling Lost.** Action HOHR1 has been established to take credit for the capability of the operating crew to switch HPCI/RCIC suction back to the CST when the suppression pool water temperature becomes hot enough to potentially damage the HPCI/RCIC pumps. This will occur when suppression pool cooling has been lost and remains unavailable despite the best efforts of the plant staff to restore it.

  To be successful, the action includes the requirement that the operators provide makeup to the CST to maintain a sufficient inventory of water for the HPCI/RCIC suction. As there are multiple water storage tanks onsite and adequate resources to accomplish these actions, it is assumed that alternate sources of water are available if the operator action is successful.

- **Operator Action HOLP3 — Open the Hardened Wetwell Vent, Given AC Power is Not Available.** Action HOLP3 evaluates the human actions required to locally open the hardened wetwell vent. This action involves only those actions needed to actuate the valves locally, and adequate guidance for accomplishing the action is contained in EOI Appendix 13. The action was evaluated by operators for various transient conditions during the preparation of the Rev. 1 I.O. #2 PRA.

- **Operator Action HOXD — Crosstie De-Energized 4-kV Shutdown Board to Energized 4-kV Shutdown Board.** Action HOXD is used to recover power for the diesel generator auxiliary board supplying HVAC support for diesel generator C in the event that diesel generators A, B, and D are unavailable. The 4-kV shutdown board C does not directly feed an diesel generator auxiliary board, so this manual action is necessary to provide the necessary crosstie. Top Event ODSB has been established to incorporate this action into the plant model.

  Discussion with operations personnel indicates that, if diesel generator C is the only Units 1 and 2 diesel generator available, the operator would most likely reenergize the auxiliary diesel generator board using a Unit 3 diesel generator or another Units 1 and 2 4-kV shutdown board by using 4-kV shutdown bus 1 or 2 as a crosstie. Procedural guidance for this is provided in 0-AOI-57-1A (Loss of Offsite Power), Attachments 1 and 8. A note in Attachment 8 specifies that, during accident conditions, diesel generator C is limited to supplying 4-kV shutdown board D (not A or B).

  Action HOXD was evaluated for the case in which the time constraints for crosstieing the 4-kV shutdown boards is not time sensitive. When applied to the restoration of a failed diesel generator auxiliary board, the action becomes more time sensitive. However, as discussed below, plant procedures key the operators to recognize the situation early, thus providing adequate time for the operators to accomplish the action.

In the event that only diesel generator C starts and operates, it is highly likely that the operators will identify that room HVAC is not available and will act to restore the auxiliary diesel generator board before the diesel generator is overheated by high room temperature. First, Procedure 0-AOI-57-1A provides guidance for verifying that the appropriate support buses are energized within the first eight instructions, and states that steps may be performed out of order, depending on plant conditions. The necessary realignment can be done from Panel 9-23 in the control room. With only one diesel generator to provide all essential AC power, operators state that they will give high priority to verifying that it is functioning properly. Second, the diesel generator procedure (0-OI-82) states, "WHEN conditions allow, THEN MONITOR and RECORD diesel generator operating parameters using illustration 2." Illustration 2 requires that operating parameters be checked every 15 minutes during the first hour of operation. Finally, height of the ceilings in the diesel generator rooms are on the order of 20 ft, so it is highly unlikely that the diesel generator that has just started up can heat a room enough to fail the diesel generator in 15 minutes. This is supported by operator experience working in a diesel generator room with an operating diesel generator and a failed HVAC fan. Over the course of 15 minutes the room heated noticeably, but only to the degree of becoming uncomfortable for the operators, not inhabitable. Therefore, an operator checking the diesel generator would be keyed restoring HVAC and the operator team will have sufficient resources and time to accomplish the necessary actions to restore it.

Table 4-1 (Page 1 of 2). Screening of Turbine Building Flooding Events							
Event	Plant	System/Component	Plant Status	Size	Included in Initiating Event FLTB2	Applicable to Initiating Event FLTB	Comment
1	Quad Cities 2	Feedwater - Feedwater Flow Regulating Valve	At Power	70,000 Gallons	Yes	No	Insufficient flood water and inventory to impact RCW.
2	Duane Arnold	Condensate - Backwash Valve Would Not Close	At Power	123,000 Gallons	Yes	No	Insufficient flood water and inventory to impact RCW.
4	Quad Cities	Circulating Water - Water Box Expansion Joint	Before Commercial Operations	15 Feet of Water	Yes	Yes	Has potential to cause severe flooding.
5	Monticello	Circulating Water - Cooling Tower Expansion Joint Failed	Shutdown	Flooded Discharge Structure	No	No	Event will not cause a flood in the BFN turbine building and impact RCW.
22	Crystal River 3	Circulating Water - Secondary Services Heat Exchanger Block Valve	At Power	Medium - 65,000 gpm	Yes	No	Insufficient flood water to impact RCW.
23	Three Mile Island 1	Circulating Water - Pump Casing	Refueling	Large - Pumphouse Flooded	No	No	Event will not cause a flood in the BFN turbine building and impact RCW.
53	Browns Ferry 1	Condensate - Blank Flange Loosened	Before Commercial Operations	Large (85,000 Gallons)	Yes	No	Insufficient flood water and inventory to impact RCW.
57	Trojan	Feedwater - Heater Drain Pump Discharge Line Rupture	During Trip	Large	Yes	No	Insufficient inventory to impact RCW.

Initiator			% Cum.	LOSP	TT	LRCW	CIV	LOFW	LOCV	TIWB	PLFW	SCRAMR	LLD	FWRU	MLOCA	PLOC	LRBCCW	ISCRAM	LLC	SLOCA
I.E. Frequency	Total Frequency			3.39E-02	1.41E+00	3.32E-02	4.34E-01	3.59E-01	2.72E-01	2.34E-01	3.31E-01	2.74E-01	3.12E-04	1.49E-01	3.32E-04	1.24E-01	8.87E-02	1.31E+00	8.27E-05	4.61E-03
FDS:																				
OIAV:	1.07E-06	19.9		3.16E-08	2.12E-07	8.48E-08	1.01E-07	7.64E-08	5.82E-08	4.99E-08	4.51E-08	3.69E-08	2.45E-08	2.97E-08	3.09E-08	2.45E-08	1.77E-08	1.52E-09	5.54E-08	6.08E-08
MIAV:	9.12E-07	36.8		1.39E-07	1.57E-07	1.52E-07	9.99E-08	3.33E-08	5.85E-08	4.95E-08	3.36E-08	2.78E-08	0.00E+00	1.14E-08	0.00E+00	2.45E-08	1.73E-08	1.91E-08	0.00E+00	0.00E+00
FIGX:	6.15E-07	48.3		6.14E-07	0.00E+00	8.86E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OLCV:	5.00E-07	57.5		1.94E-08	5.44E-08	1.39E-07	1.59E-08	2.36E-08	9.96E-09	9.83E-09	9.17E-09	8.72E-09	1.82E-08	9.24E-09	1.92E-08	3.83E-09	1.27E-08	5.01E-08	4.03E-09	1.45E-10
MKCV:	4.55E-07	66		4.28E-09	1.37E-07	2.05E-09	9.10E-08	3.21E-08	2.47E-08	4.67E-08	2.95E-08	2.39E-08	0.00E+00	1.25E-08	0.00E+00	1.04E-08	1.64E-08	0.00E+00	0.00E+00	2.12E-10
MIBV:	3.49E-07	72.4		6.66E-09	2.16E-08	1.10E-08	7.81E-08	5.86E-08	4.42E-08	3.74E-08	3.42E-09	2.13E-09	0.00E+00	2.19E-08	0.00E+00	1.75E-08	1.27E-08	0.00E+00	0.00E+00	0.00E+00
PLFV:	1.62E-07	75.4		1.13E-07	3.85E-10	2.70E-08	2.53E-09	1.90E-09	1.19E-09	9.18E-10	0.00E+00	0.00E+00	0.00E+00	6.69E-10	0.00E+00	4.75E-10	4.73E-10	3.55E-10	0.00E+00	0.00E+00
OIAX:	1.41E-07	78.1		1.41E-07	1.56E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIHV:	1.35E-07	80.6		5.27E-08	2.95E-10	7.12E-08	6.32E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.72E-10	0.00E+00	0.00E+00
OLFV:	1.33E-07	83		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.29E-08	0.00E+00	4.06E-08	0.00E+00	0.00E+00	0.00E+00	8.42E-09	0.00E+00
OIAZ:	9.94E-08	84.9		1.13E-08	2.07E-08	5.58E-09	9.97E-09	6.69E-09	5.12E-09	4.38E-09	3.94E-09	3.05E-09	1.67E-09	2.28E-09	2.47E-09	1.74E-09	1.29E-09	0.00E+00	3.55E-09	6.10E-09
OIBV:	9.90E-08	86.7		4.60E-10	3.28E-08	4.72E-10	1.59E-08	9.36E-09	6.43E-09	4.89E-09	5.40E-09	4.19E-09	0.00E+00	2.42E-09	0.00E+00	1.67E-09	1.16E-09	0.00E+00	0.00E+00	2.57E-09
MIAZ:	7.92E-08	88.2		1.13E-08	1.53E-08	1.38E-08	9.74E-09	2.06E-09	5.50E-09	4.65E-09	2.77E-09	2.34E-09	0.00E+00	7.49E-10	0.00E+00	1.90E-09	1.44E-09	1.21E-09	0.00E+00	0.00E+00
PLFX:	7.91E-08	89.7		7.91E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PIFV:	7.18E-08	91		0.00E+00	7.27E-09	0.00E+00	2.13E-08	1.77E-09	1.14E-08	9.97E-09	1.04E-09	8.70E-10	0.00E+00	6.36E-10	0.00E+00	4.40E-09	3.49E-09	4.62E-09	0.00E+00	0.00E+00
PIGZ:	4.78E-08	91.9		4.72E-08	0.00E+00	2.23E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIAZ:	4.63E-08	92.7		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MKCZ:	4.20E-08	93.5		2.42E-10	1.35E-08	1.19E-10	9.23E-09	2.63E-09	2.01E-09	4.59E-09	2.33E-09	1.93E-09	0.00E+00	1.05E-09	0.00E+00	8.86E-10	1.49E-09	0.00E+00	0.00E+00	0.00E+00
MICV:	4.06E-08	94.3		0.00E+00	8.63E-10	1.14E-09	2.52E-10	2.57E-08	2.31E-10	3.27E-10	3.28E-10	0.00E+00	0.00E+00	9.94E-09	0.00E+00	0.00E+00	9.04E-10	7.96E-10	0.00E+00	0.00E+00
OICZ:	4.02E-08	95		8.72E-10	4.82E-09	1.19E-08	1.31E-09	2.03E-09	7.33E-10	7.25E-10	7.50E-10	5.28E-10	1.78E-09	7.45E-10	1.73E-09	2.40E-10	1.03E-09	4.26E-09	3.87E-10	0.00E+00
PIGV:	3.63E-08	95.7		2.30E-08	1.20E-10	4.33E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PIAV:	3.10E-08	96.3		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PIHX:	2.71E-08	96.8		2.71E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MIBZ:	2.52E-08	97.2		2.50E-10	5.28E-10	6.35E-10	7.06E-09	4.40E-09	3.49E-09	2.85E-09	0.00E+00	0.00E+00	0.00E+00	1.60E-09	0.00E+00	1.34E-09	9.28E-10	0.00E+00	0.00E+00	0.00E+00
PLFZ:	1.75E-08	97.6		1.45E-08	0.00E+00	2.17E-09	2.00E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OICV:	1.40E-08	97.8		0.00E+00	5.29E-10	1.90E-10	2.15E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.33E-09	0.00E+00	4.60E-09	0.00E+00	0.00E+00	0.00E+00	9.42E-10	1.54E-10
NKFV:	1.29E-08	98.1		0.00E+00	3.94E-09	0.00E+00	3.26E-09	8.46E-10	6.71E-10	1.41E-09	7.80E-10	6.46E-10	0.00E+00	3.51E-10	0.00E+00	2.96E-10	4.98E-10	0.00E+00	0.00E+00	0.00E+00
PIDV:	1.28E-08	98.3		0.00E+00	4.34E-09	1.08E-10	2.05E-09	1.14E-09	8.24E-10	7.33E-10	7.49E-10	5.38E-10	0.00E+00	4.30E-10	0.00E+00	3.61E-10	2.87E-10	0.00E+00	0.00E+00	0.00E+00
PIHZ:	1.16E-08	98.5		5.50E-09	0.00E+00	5.57E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OLFZ:	9.70E-09	98.7		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.46E-09	0.00E+00	3.09E-09	0.00E+00	0.00E+00	0.00E+00	5.60E-10	0.00E+00
PIEV:	9.24E-09	98.9		0.00E+00	2.86E-09	0.00E+00	1.18E-10	1.73E-10	1.31E-10	0.00E+00	1.60E-10	3.59E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.37E-10	2.23E-09	0.00E+00	0.00E+00
NIDV:	8.78E-09	99		4.68E-10	2.82E-09	7.06E-10	1.23E-09	1.04E-09	5.24E-10	4.52E-10	5.66E-10	3.87E-10	0.00E+00	2.70E-10	0.00E+00	1.31E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIGV:	8.53E-09	99.2		6.61E-09	0.00E+00	1.29E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OIFV:	6.22E-09	99.3		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.25E-10	0.00E+00	8.90E-10	0.00E+00	0.00E+00	0.00E+00	3.79E-09	7.19E-10
PIFZ:	4.38E-09	99.4		0.00E+00	5.10E-10	0.00E+00	1.76E-09	0.00E+00	7.51E-10	5.65E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.80E-10	2.12E-10	1.96E-10	0.00E+00	0.00E+00
OIBZ:	4.25E-09	99.5		0.00E+00	1.82E-09	0.00E+00	6.96E-10	4.13E-10	2.33E-10	1.11E-10	3.17E-10	2.68E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIEV:	4.01E-09	99.5		0.00E+00	0.00E+00	0.00E+00	1.33E-09	8.68E-10	6.05E-10	5.09E-10	0.00E+00	0.00E+00	0.00E+00	3.16E-10	0.00E+00	2.65E-10	1.13E-10	0.00E+00	0.00E+00	0.00E+00
OIFX:	3.47E-09	99.6		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.80E-09	0.00E+00	1.67E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MICZ:	3.15E-09	99.7		0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.35E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.98E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIFV:	2.94E-09	99.7		0.00E+00	1.72E-09	0.00E+00	3.65E-10	0.00E+00	1.64E-10	1.45E-10	2.79E-10	2.36E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OIDV:	2.42E-09	99.8		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.77E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.72E-10	1.18E-09
PIAZ:	2.10E-09	99.8		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIGX:	1.62E-09	99.8		1.25E-10	0.00E+00	2.70E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PIFX:	1.50E-09	99.9		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIAV:	1.44E-09	99.9		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIHV:	1.22E-09	99.9		5.42E-10	0.00E+00	6.76E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OKCZ:	8.62E-10	99.9		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.16E-10	0.00E+00	4.43E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NLFV:	7.55E-10	99.9		0.00E+00	0.00E+00	3.90E-10	0.00E+00	1.45E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NKFZ:	6.55E-10	99.9		0.00E+00	3.79E-10	0.00E+00	2.76E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OKFV:	4.76E-10	100		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.30E-10	0.00E+00	2.46E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PIDZ:	4.75E-10	100		0.00E+00	3.16E-10	0.00E+00	1.59E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PKHX:	4.26E-10	100		4.26E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIGZ:	3.45E-10	100		2.39E-10	0.00E+00	1.06E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MIAX:	2.93E-10	100		1.06E-10	1.12E-10	0.00E+00	7.48E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIDZ:	2.82E-10	100		0.00E+00	2.27E-10	0.00E+00	5.49E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MKCX:	2.01E-10	100		0.00E+00	1.16E-10	0.00E+00	8.46E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MICV:	1.65E-10	100		0.00E+00	0.00E+00	0.00E+00	1.65E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIFZ:	1.38E-10	100		0.00E+00	1.38E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OIDZ:	1.21E-10	100		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-10
OKCX:	1.10E-10	100		1.10E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PIEZ:	1.05E-10	100		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PKFV:	1.02E-10	100		1.02E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIEZ:	6.26E-11	100		0.00E+00	0.00E+00	0.00E+00	6.26E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OIAV:	1.11E-12	100		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total CDF:		5.39E-06		1.35E-06	6.99E-07	5.38E-07	4.75E-07	2.88E-07	2.35E-07	2.31E-07	1.40E-07	1.15E-07	1.12E-07	1.07E-07	1.06E-07	9.48E-08	9.04E-08	8.47E-08	7.77E-08	7.20E-08
Truncation Freq:				1.00E-10	1.00E-10	1.00E-10	5.00E-11	1.00E-10	1.00E-10	1.00E-10	1.00E-10	1.00E-10	2.00E-10	1.00E-10	2.00E-10	1.00E-10	1.00E-10	1.00E-10	2.00E-10	1.00E-10
Unacct Freq:		8.71E-04		1.17E-04	8.26E-05	3.18E-05	2.86E-05	5.38E-05	4.00E-05	3.87E-05	3.97E-05	3.66E-05	6.66E-07	3.59E-05	8.21E-07	3.14E-05	2.19E-05	7.89E-05	3.67E-07	3.87E-06
Unacct Freq Multiplier:		161.5		86.9	118.3	59.1	60.1	187	169.8	167.9	283.5	319.2	6	335.4	7.8	331.9	241.9	931.6	4.7	53.7
%Cumulative				25.1	38	48	56.8	62.1	66.5	70.8	73.4	75.5	77.6	79.6	81.5	83.3	85	86.5	88	89.3

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Initiator	IOOV	IOTM	LOAC	ISLOCA	LUPS	LS00U2	LS00PA	FLRBJS	LLO	PRFO	LLS	LOPA	FLTB	FLTB2	FLPH1	ELOCA	IOTV	VLOCA	FLRB1
I.E. Frequency	3.69E-02	8.66E-04	3.72E-02	4.64E-08	9.03E-03	4.47E-02	3.59E-02	9.53E-05	1.87E-04	4.03E-02	9.17E-05	5.36E-02	2.20E-03	1.44E-02	1.22E-02	9.33E-09	5.66E-03	2.14E-02	1.20E-02
PDS:																			
OIAV	4.66E-08	5.79E-10	2.23E-08	0.00E+00	2.25E-09	7.88E-09	5.17E-09	0.00E+00	6.09E-09	7.37E-09	5.48E-09	5.67E-10	2.10E-09	5.44E-09	0.00E+00	8.37E-09	6.79E-09	2.03E-09	9.34E-10
MIAV	4.35E-10	0.00E+00	6.77E-09	0.00E+00	2.95E-08	8.22E-09	5.84E-09	0.00E+00	0.00E+00	7.48E-09	0.00E+00	1.29E-08	8.07E-09	1.47E-09	1.17E-10	0.00E+00	0.00E+00	1.54E-09	8.04E-10
FIGX	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.36E-10	1.89E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OLCV	5.44E-09	5.11E-08	5.50E-09	0.00E+00	1.08E-09	1.53E-09	8.27E-10	0.00E+00	5.81E-09	1.28E-09	4.62E-09	1.33E-09	6.84E-09	3.81E-09	1.55E-10	0.00E+00	6.95E-10	3.64E-10	1.90E-10
MKCV	2.36E-09	0.00E+00	2.43E-09	0.00E+00	4.92E-10	3.33E-09	2.21E-09	0.00E+00	0.00E+00	7.23E-09	0.00E+00	7.22E-10	0.00E+00	5.31E-10	4.78E-10	0.00E+00	0.00E+00	1.33E-09	6.97E-10
MIBV	0.00E+00	0.00E+00	4.22E-09	0.00E+00	0.00E+00	5.04E-09	1.24E-08	0.00E+00	0.00E+00	4.64E-09	0.00E+00	1.76E-09	0.00E+00	3.82E-09	8.10E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FLFV	0.00E+00	3.36E-10	0.00E+00	0.00E+00	5.54E-10	0.00E+00	1.08E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.64E-09	9.76E-10	1.17E-09	6.67E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OIAX	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E-11	0.00E+00	0.00E+00	0.00E+00
FIHV	0.00E+00	0.00E+00	6.36E-09	0.00E+00	0.00E+00	1.11E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.07E-09	1.30E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OLFV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.67E-08	0.00E+00	1.43E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OIAZ	4.54E-09	0.00E+00	1.66E-09	0.00E+00	0.00E+00	5.51E-10	3.29E-10	0.00E+00	0.00E+00	5.36E-10	0.00E+00	0.00E+00	0.00E+00	1.59E-10	0.00E+00	8.35E-10	4.29E-10	1.72E-10	0.00E+00
OIBV	6.33E-09	0.00E+00	3.99E-10	0.00E+00	8.94E-10	5.78E-10	8.99E-10	0.00E+00	0.00E+00	4.26E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.76E-10	0.00E+00	4.61E-10	1.05E-10	0.00E+00
MIAZ	0.00E+00	0.00E+00	4.62E-10	0.00E+00	2.54E-09	5.51E-10	3.29E-10	0.00E+00	0.00E+00	5.11E-10	0.00E+00	8.04E-10	4.66E-10	1.19E-10	0.00E+00	0.00E+00	0.00E+00	1.24E-10	0.00E+00
FLFX	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIFV	4.77E-10	0.00E+00	9.18E-10	0.00E+00	1.91E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E-09	0.00E+00	2.42E-10	9.68E-10	0.00E+00	0.00E+00	0.00E+00	9.46E-10
FIGZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.26E-10	1.35E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NJAZ	0.00E+00	0.00E+00	0.00E+00	4.63E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MKCZ	2.12E-10	0.00E+00	2.33E-10	0.00E+00	0.00E+00	2.79E-10	1.67E-10	0.00E+00	0.00E+00	6.81E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.28E-10	0.00E+00
MLCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OLCZ	1.51E-10	4.46E-09	1.97E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.19E-10	0.00E+00	4.44E-10	0.00E+00	3.51E-10	1.69E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIGV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.25E-09	3.29E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.93E-10	1.35E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.10E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIHX	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MIBZ	0.00E+00	0.00E+00	3.39E-10	0.00E+00	0.00E+00	4.05E-10	8.96E-10	0.00E+00	0.00E+00	3.72E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FLFZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.22E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.66E-10	0.00E+00	0.00E+00	3.62E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OKCV	1.20E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.48E-09	0.00E+00	1.08E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-11	2.87E-10	0.00E+00	0.00E+00
NKFV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.41E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIDV	9.21E-10	0.00E+00	1.50E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E-10	0.00E+00	0.00E+00
FIHZ	0.00E+00	0.00E+00	4.31E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.48E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OLFZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.55E-10	0.00E+00	6.43E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIEV	9.19E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.20E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.67E-10	0.00E+00	9.92E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIDV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.84E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIGV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.56E-10	2.64E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OIFV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIFZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.02E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OIBZ	3.89E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIEV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OIFX	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MLCZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIFV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OIDV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.26E-11	0.00E+00	0.00E+00	0.00E+00
FIAZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIGX	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.30E-10	4.95E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIFX	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.21E-10	0.00E+00	0.00E+00	0.00E+00	7.76E-10
NJAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.44E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIHV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OKCZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.46E-12	0.00E+00	0.00E+00	0.00E+00
NLFV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.20E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NKFZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OKFV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIDZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FKIX	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIGZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MIAX	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIBZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MKCX	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MICV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIFZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OIDZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.86E-12	0.00E+00	0.00E+00	0.00E+00
OKCX	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIEZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FKFV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIEZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OIAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total CDFs:	6.88E-08	5.65E-08	5.23E-08	4.63E-08	3.75E-08	3.55E-08	3.48E-08	3.45E-08	3.16E-08	1.07E-08	2.66E-08	2.30E-08	2.22E-08	1.93E-08	1.15E-08	9.10E-09	8.77E-09	5.80E-09	4.35E-09
Truncation Freq:	1.00E-10	2.00E-10	1.00E-10	1.00E-10	1.00E-10	1.00E-10	1.00E-10	5.00E-10	2.00E-10	1.00E-10	2.00E-10	1.00E-10	1.00E-10	1.00E-10	1.00E-10	1.00E-12	1.00E-10	1.00E-10	1.00E-10
Uncert Freq:	1.18E-05	1.86E-06	1.65E-05	5.82E-11	6.46E-06	2.32E-05	3.33E-05	7.13E-07	3.87E-07	1.52E-05	3.60E-07	4.05E-05	7.12E-06	2.18E-05	1.33E-05	2.91E-10	4.31E-06	1.00E-05	8.77E-06
Uncert Freq Multiplier:	170.7	33	315.8	0	172	654.2	956.9	20.6	12.2	496.1	13.5	1759.3	321.2	1130	1161.2	0	491.1	1730.9	2016.6
%Cumulative	90.6	91.6	92.6	93.5	94.2	94.8	95.5	96.1	96.7	97.3	97.8	98.2	98.6	99	99.2	99.3	99.5	99.6	99.7

Initiator	LICB	LICA	LIB	LIA	LIIB	LIIA	BOC	FLRB3C	FLRB2	UI	UII
I.E. Frequency	3.52E-03	3.51E-03	5.74E-03	5.74E-03	5.74E-03	5.74E-03	6.67E-04	1.23E-04	2.05E-06	6.51E-04	6.51E-04
FDS:											
OIAV:	6.03E-10	6.01E-10	6.51E-10	6.51E-10	6.51E-10	6.51E-10	0.00E+00	1.37E-11	1.80E-10	7.71E-11	7.72E-11
MIAV:	6.31E-10	6.28E-10	5.87E-10	5.05E-10	5.05E-10	5.05E-10	1.30E-09	5.85E-10	6.57E-11	5.71E-11	5.74E-11
FIGX:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OICV:	4.57E-10	4.56E-10	1.28E-10	1.28E-10	1.28E-10	1.28E-10	0.00E+00	6.35E-12	0.00E+00	1.45E-11	1.45E-11
MICV:	6.19E-10	6.17E-10	4.44E-10	4.44E-10	4.44E-10	4.44E-10	0.00E+00	8.51E-12	0.00E+00	5.33E-11	5.30E-11
MIBV:	3.97E-10	3.95E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FLFV:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.85E-12	0.00E+00	0.00E+00
OIAX:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIHV:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OLFV:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OIAZ:	4.59E-11	4.57E-11	4.61E-11	4.61E-11	4.61E-11	4.61E-11	0.00E+00	9.88E-13	1.43E-11	5.24E-12	5.24E-12
OIBV:	3.73E-11	3.72E-11	4.96E-11	4.96E-11	4.96E-11	4.96E-11	0.00E+00	6.02E-13	1.45E-12	5.63E-12	5.63E-12
MIAZ:	4.38E-11	4.36E-11	3.32E-11	3.32E-11	3.32E-11	3.32E-11	1.25E-10	5.31E-11	4.30E-12	3.77E-12	3.77E-12
FLFX:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIFV:	1.02E-10	1.02E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIGZ:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NJAZ:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MKCZ:	4.95E-11	4.93E-11	3.44E-11	3.44E-11	3.44E-11	3.44E-11	0.00E+00	7.66E-13	0.00E+00	3.91E-12	3.91E-12
MICV:	3.53E-11	3.52E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.65E-11	0.00E+00	0.00E+00	0.00E+00
OICZ:	2.81E-11	2.80E-11	1.11E-11	1.11E-11	1.11E-11	1.11E-11	0.00E+00	0.00E+00	0.00E+00	1.26E-12	1.26E-12
FIGV:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.73E-12	0.00E+00	0.00E+00
FJAV:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIHX:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MIBZ:	3.19E-11	3.18E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FLFZ:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OKCV:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NKFV:	1.21E-11	1.21E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIDV:	0.00E+00	0.00E+00	1.13E-11	1.13E-11	1.13E-11	1.13E-11	0.00E+00	0.00E+00	0.00E+00	1.28E-12	1.28E-12
FIHZ:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OLFZ:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIEV:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.08E-11	0.00E+00	0.00E+00
NIDV:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.06E-12	0.00E+00	0.00E+00	0.00E+00
NIGV:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.98E-12	0.00E+00	0.00E+00
OIFV:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIFZ:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OIBZ:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIEV:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OIFX:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MLCZ:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.43E-12	0.00E+00	0.00E+00	0.00E+00
NIFV:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.06E-11	0.00E+00	0.00E+00
OIDV:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FJAZ:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIGX:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIFX:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NJAV:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIHV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OKCZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NLFV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NKFZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OKFV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIDZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FKHX	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIGZ:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MIAX:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIDZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MKCX	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MICV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIFZ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OIDZ:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OKCX	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FIEZ:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.34E-12	0.00E+00	0.00E+00
FKFV:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NIEZ:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OJAV:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.11E-12	0.00E+00	0.00E+00
Total CDFs:	3.09E-09	3.08E-09	1.99E-09	1.91E-09	1.91E-09	1.91E-09	1.42E-09	6.90E-10	3.86E-10	2.23E-10	2.23E-10
Truncation Freq:	1.00E-11	1.00E-11	1.00E-11	1.00E-11	1.00E-11	1.00E-11	1.00E-10	5.00E-13	1.00E-12	1.00E-12	1.00E-12
Unacct Freq:	1.58E-06	1.57E-06	1.66E-06	1.66E-06	1.66E-06	1.66E-06	1.82E-06	4.55E-08	7.88E-09	1.95E-07	1.95E-07
Unacct Freq Multiplier:	509.5	510.3	833.9	869.5	869.6	869.5	1276	65.9	20.4	872.1	872.2
%Cumulative	99.7	99.8	99.8	99.9	99.9	99.9	100	100	100	100	100

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