[redacted]

ET-NRC-93-3990

OCTOBER 20, 1993

[redacted]

AP600
REACTOR COOLANT SYSTEM LEAK
PRA EVALUATION

October 1993

[redacted]

Table of Contents

1.0 INTRODUCTION

During an NRC/EPRI meeting on the Regulatory Treatment of Non-Safety Systems (RTNSS) held on November 18, 1992, R. Youngblood of Brookhaven National Laboratories presented an evaluation of reliability goals and safety systems performance. This presentation included the identification of 39 reactor coolant system (RCS) leakage events with leak rates between 1 and 100 gallon per minute (gpm) and 48 events with leak rates less than 1 gpm at pressurized water reactors (PWR) during the period from 1987 to 1992 which included approximately 421 reactor years of PWR operation. Apparent concern over such events with respect to the AP600 design is that since the AP600 chemical and volume control system is a nonsafety-related system, these leakage events are not adequately addressed by the AP600 Probabilistic Risk Assessment (PRA). The analysis presented in the AP600 PRA report covers the range of loss of coolant accidents from a 100 gpm leak (very small LOCA category) up through the double-ended severance of the largest pipe in the primary coolant system. This RCS leakage event is now included in the AP600 baseline PRA which improves accuracy of the focused PRA for the regulatory treatment of nonsafety systems.

2.0 PURPOSE

The purpose of this document is to discuss the resolution of the RCS leakage issue identified above. The two ranges of leak rates identified are addressed separately.

For the 0 to 1 gpm leak range, a qualitative evaluation is performed. For a 1 gpm leak, with no makeup flow, it takes more than 60 hours to empty the pressurizer and more than 190 hours to drain the volume of water from a core makeup tank (CMT) to the automatic depressurization system (ADS) actuation water level setpoint. That is, with both CMTs operating, it would take more than 18 days to get to the ADS actuation setpoint. Failure to recognize and identify such a leak and neither correct the situation nor manually bring the plant to a safe shutdown condition is sufficiently unlikely that it is not in the scope of typical risk assessment studies.

For the 1 to 100 gpm leak rate range, a quantitative evaluation of the RCS leakage event is performed. The analysis includes: calculating a leakage initiating event frequency, calculating the probability of repairing the chemical and volume control system (CVCS) makeup system, developing an RCS leak event tree, quantifying the event tree, and finally incorporating the results into the current Baseline PRA results. The release frequency is also reanalyzed due to the additional core damage sequences that propagate through to the containment event trees.

This RCS leakage event is an addition to the other initiating events currently included in the baseline AP600 PRA. The core damage frequency and the release frequency associated with this event are a small addition to those values submitted to the NRC on June 26, 1992 in the AP600 Probabilistic Risk Assessment Report. The AP600 PRA report tables dealing with core damage frequency (i.e., Tables 7-1 and 8-1) change as a result of including the RCS leak event. The revisions to those tables are included in this letter as Tables 1 and 2. The increase in release frequency is sufficiently small that it does not change any reported results.

3.0 ANALYSIS

The analysis of core damage frequency and release frequency for the RCS leakage event is performed in the distinct steps described in Subsections 3.1, 3.2 and 3.3.

3.1 Create the RCS Leak Event Tree

The RCS leak event, defined as an RCS leak rate less than or equal to 100 gpm combined with failure of the CVCS to provide makeup to the RCS, is actually a very small loss of coolant accident with the distinction that the leak is sufficiently small that a "long" period of time is required to deplete the primary coolant system to the extent that the water level in the core makeup tanks will cause actuation of the ADS. The length of this time period is a function of the leak rate but in any case is long enough to permit repair of the CVCS. A new event tree, Reactor Coolant System Leak, was created and is shown in Figure 1. This event tree is based on Figure F-18 of the AP600 PRA report (very small loss of coolant accident event tree). Figure F-18 was modified to account for the possibility of repairing the CVCS if the core makeup tanks operated successfully. The RCS leak initiating event is given the acronym of SL.

This study is done for a breach of the primary coolant system of such size that results in an initial leak flow rate of 50 gpm. For such a leak, successful operation of the CMTs would preclude ADS actuation for more than 5 hours, during which time the CVCS could be repaired. This time is calculated on the basis of the pressurizer emptying to the safety injection signal setpoint and then one CMT injecting to get to the ADS actuation setpoint for CMT water level. By using 1 out of 2 CMTs as the success criterion, fault tree CM2SL from the "June 26, 1992" PRA could be used for this study. The probability of failing to repair the CVCS in 4 to 6 hours was calculated to be 0.50 and this value is used in the core damage frequency analysis. Repair of the CVCS is given the basic event identifier OTH-CVCSFIX.

The initiating event frequency for the RCS leak event (IEV-SL) is based on data reported by EPRI for PWRs operating during the 1987 to 1992 time period. These data include 39 leakage events that had a leak rate in the 1 gpm to 100 gpm range. The these 39 events were evaluated to determine whether or not each event was possible on the AP600 design. As a result, 30 of the events were screened out (for example, RCS pump seal leaks were eliminated because AP600 does not have RCP seals) leaving nine events that are possible on the AP600. Of these 9 RCS leakage events, 5 occurred at-power and 4 occurred during shutdown. The impact of these leaks is different for at-power and shutdown operation; The time available for corrective action at shutdown is significantly longer than at-power and therefore contribute less to any change in core damage frequency. The maximum leak flow rate of the 5 at-power leakage events that could have occurred on the AP600 is 10 gpm. Because of this, using a leak flow rate of 50 gpm in the calculations to represent the 1 to 100 gpm range is reasonable and conservative with respect to historical data.

The RCS leak initiating event is defined as an event having leakage from the RCS less than 100 gpm combined with failure of the chemical and volume control system (CVCS) makeup pumps. The 5 events from the EPRI data base represent 421 reactor years of PWR operation so the frequency of an RCS leak for AP600 is 5/421 = 1.2E-2 events per year.

The unavailability of the makeup system (where success of the system is either of the two makeup pumps starting and running for 24 hours) is simply taken as the failure probability of the CSLOCA fault tree from the June 26, 1992 PRA. This value is 5.4E-3. Therefore, the RCS leak initiating event frequency is

(1.2E-2) (5.4E-3) = 6.5E-5 events per year.

A revised list of AP600 initiating event group frequencies is shown in Table 1.

3.2 Quantify the Core Damage Frequency for the RCS Leak Event

The RCS leak event tree was quantified and the resulting core damage frequency is 1.6E-9 events per year. The core damage frequency associated with the RCS leak initiating event is combined with the other AP600 initiating events and the revised total core damage frequency is 3.4E-7 events per year. Table 2 shows the revised list of initiating events contributing to core damage (Baseline, at-power conditions) and Table 3 shows the revised dominant accident sequence cutsets for this case. An importance analysis is done to rank the revised set of initiating events and the results are shown in Table 4.

3.3 Update the Containment Event Trees (CET)

The revised release frequency is calculated by quantifying the containment event trees with the core damage frequency information that includes the RCS leak event. The only containment event tree release frequency that was changed by the addition of the RCS leak initiating event is impaired containment (CI). The CI release frequency was 2.013E-8 in the June 26, 1992 analysis and increases to 2.017E-8 in this revised analysis due to the addition of the RCS leak event.

4.0 CONCLUSION

The evaluation of relatively small reactor coolant system leaks was performed in a conservative manner with respect to the assumed leak rate and probability of returning the failed primary coolant makeup system back into service. The results of this study show a 0.5 percent increase in core damage frequency and a 0.2 percent increase in the frequency of release from containment. This category of initiating events will be included in future AP600 PRA studies and PRA reports.

TABLE 1
AP600 INITIATING EVENT GROUP FREQUENCIES

EVENT	FREQUENCY (Event/Year)
Manual Shutdown	negligible
Transients	
Turbine trip or spurious reactor trip	1.40
Loss of feedwater flow	0.46
Secondary to primary side power mismatch	0.054
Core power excursion	4.47E-3
Spurious S-signal	0.085
Loss of component cooling system	0.014
Loss of service water system	0.026
Loss of compressed air	0.014
Main steam line break downstream of main steam isol. valves	6.0E-4
Main steam line break upstream of main steam isol. valves	3.7E-4
Main steam line safety valve stuck open	1.2E-3
Loss of Offsite Power	0.086
Loss of Coolant Accidents	
Large loss of coolant accident	9.7E-5
Medium loss of coolant accident	5.6E-4
Core makeup tank line break	1.3E-4
Safety injection line break	1.2E-4
Small loss of coolant accident	5.2E-4
Very small loss of coolant accident	5.5E-4
Reactor coolant system leak	6.5E-5
Passive residual heat removal tube rupture	5.0E-3
Steam generator tube rupture	5.2E-3
Reactor vessel rupture	3.0E-8
Interfacing loss of coolant accidents	negligible
Large break outside containment	negligible
Anticipated Transients Without Scram	0.53

TABLE 2
INITIATING EVENTS CONTRIBUTING TO CORE DAMAGE
(Base Case - At Power)

INITIATING EVENT	CORE DAMAGE FREQUENCY (Events per Year)	PERCENTAGE OF TOTAL
Transients (except LOOP):		
Turbine/reactor trip (TT)	4.3E-8	12.8
Others	2.9E-8	8.9
LOOP (TE)	3.0E-9	0.9
Small LOCA (S2)	2.3E-8	6.9
Very small LOCA (S2S)	1.2E-8	3.5
Reactor coolant system leak (SL)	1.6E-9	0.5
PRHR tube rupture (S2P)	4.2E-8	12.4
Medium LOCA (S1)	1.2E-8	3.5
Safety injection line break (S1S)	7.3E-8	21.6
CMT line break (S1C)	2.7E-9	0.8
Large LOCA (A)	1.6E-8	4.7
SG tube rupture (V2)	2.6E-9	0.8
ATWS (TFA)	4.6E-8	13.8
Vessel rupture (VR)	3.0E-8	8.9
TOTAL	3.4E-7	100.0

TABLE 3
DOMINANT ACCIDENT SEQUENCE CUTSETS - INCLUDES RCS LEAK EVENT

NUMBER	SEQUENCE PROBABILITY	PERCENT CONTRIB	SEQUENCE DESCRIPTION				SEQUENCE IDENTIFIER
1	6.80E-08	18.89	SAFETY INJECTION FAILURE OF	LINE BREAK 1 OF 1 GRAVITY	INITIATING EVENT OCCURS INJECTION LINE		IEV-S1S SYS-IW1A
2	4.62E-08	12.83	LOSS OF FEEDWAT. REACTOR TRIP AMSAC SYSTEM	WITHOUT SCRAM FUNCTION FAILURE FAILS	INITIATING EVENT OCCURS		IEV-TFA SYS-CE SYS-AMSAC
3	3.23E-08	8.97	PASSIVE RHR TUBE CSLOCA AND PRI AUTOMATIC ADS RNS FAILS TO	RUPTURE TOP EVENT NODES ACT. FAILS FULL OPERATE IN	INITIATING EVENT OCCURS FAIL RCS DEPRESSURIZ. INJECTION MODE	(S2 W/PRHR & CMT (LOCA/TRANSIENT)	IEV-S2P SYS-XCSLPRI SYS-ADS SYS-RNR
4	3.06E-08	8.49	TURBINE/REACTOR COND AND SFW FAILURE OF 2/2 MANUAL ADS MANUAL ADS ACTUA	TRIP /L.RCS FLOW AND PRT SYSTEMS CMTS FOR ACT. FAILS FULL FAILS PART'L RCS	INITIATING EVENT OCCURS FAIL TRANSIENTS RCS DEPRESSURIZ. DEPRESSURIZATION	(TRANS W/O CMT) (TRANS W/O CMT)	IEV-TT SYS-XCSP SYS-CM2AB SYS-ADT SYS-AD1
5	3.00E-08	8.33	VESSEL RUPTURE	INITIATING EVENT	OCCURS		IEV-VR
6	2.58E-08	7.15	CLASS 2 EARLY FAILURE TO FAILURE OF IRWST	CONTAINMENT RECOVER CONTAIN. WATER MAKEUP FOR	LEAK OCCURS ISOLATION IN LONG TERM CORE	IEV FREQUENCY THE LONG TERM COOLING	SYS-IEC2E SYS-CIR SYS-IWTM
7	1.51E-08	4.19	LARGE LOCA FAILURE OF	INITIATING EVENT 2 OF 2 GRAVITY	OCCURS INJECTION LINES		IEV-A SYS-IW2AB
8	1.40E-08	3.87	SMALL LOCA AUTOMATIC ADS AUTOMATIC ADS	INITIATING EVENT ACT. FAILS FULL ACT. FAILS PARTL	OCCURS RCS DEPRESSURIZ. RCS DEPRESSURIZ.	(S2 W/PRHR & CMT (S2 W/PRHR & CMT	IEV-S2 SYS-ADS SYS-ADV
9	1.11E-08	3.08	LOSS OF FW TO COND AND SFW FAILURE OF 2/2 MANUAL ADS MANUAL ADS ACTUA	STEAM GENERATOR AND PRT SYSTEMS CMTS FOR ACT. FAILS FULL FAILS PART'L RCS	INITIATING EVENT OCCURS FAIL TRANSIENTS RCS DEPRESSURIZ. DEPRESSURIZATION	(TRANS W/O CMT) (TRANS W/O CMT)	IEV-TF SYS-XCSP SYS-CM2AB SYS-ADT SYS-AD1
10	8.32E-09	2.31	TURBINE/REACTOR COND AND SFW AUTOMATIC ADS RNS FAILS TO	TRIP /L.RCS FLOW AND PRT SYSTEMS ACT. FAILS FULL OPERATE IN	INITIATING EVENT OCCURS FAIL RCS DEPRESSURIZ. INJECTION MODE	(TRANS WITH CMT) (LOCA/TRANSIENT)	IEV-TT SYS-XCSP SYS-ADA SYS-RNR
11	6.62E-09	1.84	CONSEQUENTIAL	SG TUBE RUPTURE	INITIATING EVENT OCCURS		SYS-IECV2

TABLE 3
DOMINANT ACCIDENT SEQUENCE CUTSETS - INCLUDES RCS LEAK EVENT

			DELETE NON-	SENSICAL CUTSETS	FROM V2	SEQUENCES	DEL-V2DEL
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(S2 W/PRHR & CMT	SYS-ADS
			AUTOMATIC ADS	ACT. FAILS PARTL	RCS DEPRESSURIZ.	(S2 W/PRHR & CMT	SYS-ADV
12	6.13E-09	1.70	MEDIUM LOCA	INITIATING EVENT	OCCURS		IEV-S1
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(S1 WITH CMT)	SYS-ADM
13	5.44E-09	1.51	MEDIUM LOCA	INITIATING EVENT	OCCURS		IEV-S1
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
			FAILURE OF	2 OF 2 GRAVITY	INJECTION LINES		SYS-IW2AB
14	5.33E-09	1.48	VERY SMALL LOCA	INITIATING EVENT	OCCURS		IEV-S2S
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
			FAILURE OF	2 OF 2 GRAVITY	INJECTION LINES		SYS-IW2AB
15	5.23E-09	1.45	PASSIVE RHR TUBE	RUPTURE	INITIATING EVENT	OCCURS	IEV-S2P
			ADV EVENT TREE	NODE IS	SUCCESSFUL	(AUTO DEPRESS.)	DEL-ADV

TABLE 3
DOMINANT ACCIDENT SEQUENCE CUTSETS - INCLUDES RCS LEAK EVENT

NUMBER	SEQUENCE PROBABILITY	PERCENT CONTRIB	SEQUENCE DESCRIPTION				SEQUENCE IDENTIFIER
			PRI AND RNR	TOP EVENT NODES	FAIL		SYS-XPRIRNR
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(S2 W/PRHR & CMT	SYS-ADS
16	5.04E-09	1.40	SMALL LOCA	INITIATING EVENT	OCCURS		IEV-S2
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
			FAILURE OF	2 OF 2 GRAVITY	INJECTION LINES		SYS-IW2AB
17	3.55E-09	.98	VERY SMALL LOCA	INITIATING EVENT	OCCURS		IEV-S2S
			CVCS MAKE-UP	FAILS DURING	S2S/S2P (VERY	SMALL LOCA)	SYS-CSLOCA
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(S2 W/PRHR & CMT	SYS-ADS
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
18	3.49E-09	.97	SAFETY INJECTION	LINE BREAK	INITIATING EVENT	OCCURS	IEV-S1S
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(S1 WITH CMT)	SYS-ADM
19	3.01E-09	.84	LOSS OF FW TO	STEAM GENERATOR	INITIATING EVENT	OCCURS	IEV-TF
			COND AND SFW	AND PRT SYSTEMS	FAIL		SYS-XCSP
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS WITH CMT)	SYS-ADA
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
20	2.57E-09	.71	PASSIVE RHR TUBE	RUPTURE	INITIATING EVENT	OCCURS	IEV-S2P
			PRI AND RNR	TOP EVENT NODES	FAIL		SYS-XPRIRNR
			FAILURE OF	2 OF 2 GRAVITY	INJECTION LINES		SYS-IW2AB
21	2.39E-09	.66	STEAM GENERATOR	TUBE RUPTURE	INITIATING EVENT	OCCURS	IEV-V2
			DELETE NON-SGTR CONTINUES	SENSICAL CUTSETS	FROM V2	SEQUENCES	DEL-V2DEL SYS-V2CONT
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(S2 W/PRHR & CMT	SYS-ADS
			AUTOMATIC ADS	ACT. FAILS PARTL	RCS DEPRESSURIZ.	(S2 W/PRHR & CMT	SYS-ADV
22	2.13E-09	.59	CONSEQUENTIAL	MSL SV STUCK	OPEN INITIATING	EVENT OCCURS	SYS-IECTSOV
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT	FROM RPV (TRANS)	SYS-PRT
			FAULURE OF 2/2	CMTS FOR SMALL	LOCAS		SYS-CM2SL
			MANUAL ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS W/O CMT)	SYS-ADT
			MANUAL ADS ACTUA	FAILS PART'L RCS	DEPRESSURIZATION	(TRANS W/O CMT)	SYS-AD1
23	1.73E-09	.48	SMALL LOCA	INITIATING EVENT	OCCURS		IEV-S2
			FAILURE TO	TRIP ALL FOUR	RCS PUMPS		SYS-RCSL
			MANUAL ADS ACTUA	FAILS FULL RCS	DEPRESSUR. SLOCA	W/PRHR, W/O CMT)	SYS-ADN
			MANUAL ADS ACT	FAILS PARTL RCS	DEPRESSUR. (S2	W/PRHR W/O CMT)	SYS-ADZ
24	1.41E-09	.39	CMT LINE BREAK	INITIATING EVENT	OCCURS		IEV-S1C
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(S1 WITH CMT)	SYS-ADM
25	1.25E-09	.35	CMT LINE BREAK	INITIATING EVENT	OCCURS		IEV-S1C

TABLE 3
DOMINANT ACCIDENT SEQUENCE CUTSETS - INCLUDES RCS LEAK EVENT

			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
			FAILURE OF	2 OF 2 GRAVITY	INJECTION LINES		SYS-IW2AB
26	1.19E-09	.33	SMALL LOCA	INITIATING EVENT	OCCURS		IEV-S2
			FAULURE OF 2/2	CMTS FOR SMALL	LOCAS		SYS-CM2SL
			MANUAL ADS ACTUA	FAILS FULL RCS	DEPRESSUR. SLOCA	W/PRHR, W/O CMT)	SYS-ADN
			MANUAL ADS ACT.	FAILS PARTL RCS	DEPRESSUR. (S.	W/PRHR W/O CMT)	SYS-ADZ
27	1.19E-09	.33	SPURIOUS "S"	SIGNAL	INITIATING EVENT	OCCURS	IEV-TS
			SFW AND PRT	SYSTEMS FAIL			SYS-XWP
			FAILURE TO	TRIP ALL FOUR	RCS PUMPS		SYS-RCSL
			MANUAL ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS W/O CMT)	SYS-ADT
			MANUAL ADS ACTUA	FAILS PART'L RCS	DEPRESSURIZATION	(TRANS W/O CMT)	SYS-AD1
28	1.18E-09	.33	SECONDARY TO	PRIMARY SIDE	POWER MISMATCH	IN. EVENT OCCURS	IEV-TM
			COND AND SFW	AND PRT SYSTEMS	FAIL		SYS-XCSP
			FAILURE OF 2/2	CMTS FOR	TRANSIENTS		SYS-CM2AB

TABLE 3
DOMINANT ACCIDENT SEQUENCE CUTSETS - INCLUDES RCS LEAK EVENT

NUMBER	SEQUENCE PROBABILITY	PERCENT CONTRIB	SEQUENCE DESCRIPTION				SEQUENCE IDENTIFIER
			MANUAL ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS W/O CMT)	SYS-ADT
			MANUAL ADS ACTUA	FAILS PART'L RCS	DEPRESSURIZATION	(TRANS W/O CMT)	SYS-AD1
29	1.16E-09	.32	VERY SMALL LOCA	INITIATING EVENT	OCCURS		IEV-S2S
			CVCS MAKE-UP	FAILS DURING	S2S/S2P (VERY	SMALL LOCA)	SYS-CSLOCA
			FAILURE TO	TRIP ALL FOUR	RCS PUMPS		SYS-RCSL
			MANUAL ADS ACTUA	FAILS FULL RCS	DEPRESSUR. SLOCA	W/PRHR, W/O CMT)	SYS-ADN
			MANUAL ADS ACT.	FAILS PARTL RCS	DEPRESSUR. (S2	W/PRHR W/O CMT)	SYS-ADZ
30	1.11E-09	.31	LOSS OF OFFSITE	POWER	INITIATING EVENT	OCCURS	IEV-TE
			GRID IS NOT	RECOVERED WITHIN	30 MINUTES	FOLLOWING LOSP	OTH-R05
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT	FROM RPV (LOSP)	SYS-PRP
			FAILURE OF SFW	TO SUPPLY SG A	FROM CST -	NO DST	SYS-SFWP
			FAULURE OF 2/2	CMTS FOR TE			SYS-CM2P
			MANUAL ADS ACTUA	FAILS FULL RCSL	DEPRESSURIZATION	(TE W/O CMT)	SYS-ADL
			MANUAL ADS	ACT. FAILS PARTL	RCS DEPRESSURIZ.	(TE W/O CMT)	SYS-ADR
31	9.07E-10	.25	LOSS OF COMPRES	AIR SYSTEM	INITIATING EVENT	OCCURS	IEV-TCA
			FAILURE OF 2/2	SFW TRAINS	-NO INSTRUMENT	AIR-	SYS-SFM
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT	FROM RPV (TRANS)	SYS-PRT
			FAILURE OF 2/2	CMTS FOR	TRANSIENTS		SYS-CM2AB
			MANUAL ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS W/O CMT)	SYS-ADT
			MANUAL ADS ACTUA	FAILS PART'L RCS	DEPRESSURIZATION	(TRANS W/O CMT)	SYS-AD1
32	8.34E-10	.23	IEV-SL				IEV-SL
			OTH-CVCSFIX				OTH-CVCSFIX
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(S2 W/PRHR & CMT	SYS-ADS
			AUTOMATIC ADS	ACT. FAILS PARTL	RCS DEPRESSURIZ.	(S2 W/PRHR & CMT	SYS-ADV
33	8.30E-10	.23	SECONDARY TO	PRIMARY SIDE	POWER MISMATCH	IN. EVENT OCCURS	IEV-TM
			STEAM DUMP AND	MAIN CONDENSOR	AVAILABLE		DEL-COND
			FRACTION OF	POWER MISMATCH	EVENTS IN WHICH	SFW IS ALSO LOST	OTH-VAL3
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT	FROM RPV (TRANS)	SYS-PRT
			FAILURE OF 2/2	CMTS FOR	TRANSIENTS		SYS-CM2AB
			MANUAL ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS W/O CMT)	SYS-ADT
			MANUAL ADS ACTUA	FAILS PART'L RCS	DEPRESSURIZATION	(TRANS W/O CMT)	SYS-AD1
34	8.24E-10	.23	SPURIOUS "S"	SIGNAL	INITIATING EVENT	OCCURS	IEV-TS
			FRACTION OF	SPURIOUS S SIGN.	EVENTS IN WHICH	SFW IS ALSO LOST	OTH-VAL4
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT	FROM RPV (TRANS)	SYS-PRT
			FAULURE OF 2/2	CMTS FOR LOCAS			SYS-CM2L
			MANUAL ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS W/O CMT)	SYS-ADT
			MANUAL ADS ACTUA	FAILS PART'L RCS	DEPRESSURIZATION	(TRANS W/O CMT)	SYS-AD1
35	7.14E-10	.20	PASSIVE RHR TUBE	RUPTURE	INITIATING EVENT	OCCURS	IEV-S2P
			ADZ EVENT TREE	NODE IS	SUCCESSFUL	(AUTO DEPRESS.)	DEL-ADZ

TABLE 3
DOMINANT ACCIDENT SEQUENCE CUTSETS - INCLUDES RCS LEAK EVENT

			FAILURE TO	TRIP ALL FOUR	RCS PUMPS		SYS-RCSL
			PRHR ISOLATION	FAILURE FOLLOW.	PRHR TUBE RUPT.	CVS UNAVAILABLE	SYS-PRII
			MANUAL ADS ACTUA	FAILS FULL RCS	DEPRESSUR. SLOCA	W/PRHR, W/O CMT)	SYS-ADN
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
36	6.88E-10	.19	VERY SMALL LOCA	INITIATING EVENT	OCCURS		IEV-S2S
			ADV EVENT TREE	NODE IS	SUCCESSFUL	(AUTO DEPRESS.)	DEL-ADV
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(S2 W/PRHR & CMT	SYS-ADS
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
37	6.64E-10	.18	CONSEQUENTIAL	SG TUBE RUPTURE	INITIATING EVENT	OCCURS	SYS-IECV2
			FAILURE OF	2 OF 2 GRAVITY	INJECTION LINES		SYS-IW2AB
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
38	6.50E-10	.18	SMALL LOCA	INITIATING EVENT	OCCURS		IEV-S2
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(S2 W/PRHR & CMT	SYS-ADS
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR

TABLE 3
DOMINANT ACCIDENT SEQUENCE CUTSETS - INCLUDES RCS LEAK EVENT

NUMBER	SEQUENCE PROBABILITY	PERCENT CONTRIB	SEQUENCE DESCRIPTION				SEQUENCE IDENTIFIER
39	6.43E-10	.18	LOSS OF SERVICE	WATER SYSTEM	INITIATING EVENT	OCCURS	IEV-TSW
			SFW AND PRT	SYSTEMS FAIL			SYS-XWP
			FAILURE OF 2/2	CMTS FOR	TRANSIENTS		SYS-CM2AB
			MANUAL ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS W/O CMT)	SYS-ADT
40	6.18E-10	.17	SPURIOUS "S"	SIGNAL	INITIATING EVENT	OCCURS	IEV-TS
			SFW AND PRT	SYSTEMS FAIL			SYS-XWP
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS WITH CMT)	SYS-ADA
			AUTOMATIC ADS	ACT. FAILS PART'	RCS DEPRESSURIZ.	(TRANS WITH CMT)	SYS-AD1A
41	5.82E-10	.16	VERY SMALL LOCA	INITIATING EVENT	OCCURS		IEV-S2S
			CVCS MAKE-UP	FAILS DURING	S2S/S2P (VERY	SMALL LOCA)	SYS-CSLOCA
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(S2 W/PRHR & CMT	SYS-ADS
			AUTOMATIC ADS	ACT. FAILS PARTL	RCS DEPRESSURIZ.	(S2 W/PRHR & CMT	SYS-ADV
42	5.80E-10	.16	LOSS OF OFFSITE	POWER	INITIATING EVENT	OCCURS	IEV-TE
			GRID IS NOT	RECOVERED WITHIN	30 MINUTES	FOLLOWING LOSP	OTH-R05
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT	FROM RPV (LOSP)	SYS-PRP
			FAILURE OF SFW	TO SUPPLY SG A	FROM CST -	NO DST	SYS-SFWP
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(LOSP WITH CMT)	SYS-ADAL
			AUTOMATIC ADS	ACT. FAILS PARTL	RCS DEPRESSURIZ.	(TE WITH CMT)	SYS-ADRA
43	5.38E-10	.15	TURBINE/REACTOR	TRIP /L.RCS FLOW	INITIATING EVENT	OCCURS	IEV-TT
			STEAM DUMP AND	MAIN CONDENSOR	AVAILABLE		DEL-COND
			FWT AND SFWTD	AND PRT SYSTEMS	FAIL		SYS-XFSP
			FAILURE OF 2/2	CMTS FOR	TRANSIENTS		SYS-CM2AB
			MANUAL ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS W/O CMT)	SYS-ADT
			MANUAL ADS ACTUA	FAILS PART'L RCS	DEPRESSURIZATION	(TRANS W/O CMT)	SYS-AD1
44	5.22E-10	.14	CONSEQUENTIAL	MSL SV STUCK	OPEN INITIATING	EVENT OCCURS	SYS-IECTSOV
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT	FROM RPV (TRANS)	SYS-PRT
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS WITH CMT)	SYS-ADA
			AUTOMATIC ADS	ACT. FAILS PART'	RCS DEPRESSURIZ.	(TRANS WITH CMT)	SYS-AD1A
45	3.54E-10	.10	CONSEQUENTIAL	MEDIUM LOCA	INITIATING EVENT	OCCURS	SYS-IECS1
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(S1 WITH CMT)	SYS-ADM
46	3.53E-10	.10	CONSEQUENTIAL	MEDIUM LOCA	INITIATING EVENT	OCCURS	SYS-IECS1
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
			FAILURE OF	2 OF 2 GRAVITY	INJECTION LINES		SYS-IW2AB
47	3.19E-10	.09	SECONDARY TO	PRIMARY SIDE	POWER MISMATCH	IN. EVENT OCCURS	IEV-TM
			COND AND SFW	AND PRT SYSTEMS	FAIL		SYS-XCSP
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS WITH CMT)	SYS-ADA

TABLE 3
DOMINANT ACCIDENT SEQUENCE CUTSETS - INCLUDES RCS LEAK EVENT

			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
48	3.06E-10	.08	LOSS OF FW TO	STEAM GENERATOR	INITIATING EVENT OCCURS		IEV-TF
			FRACTION OF LOSS	OF FW EVENTS IN	WHICH CONDENSOR	IS ALSO LOST	OTH-VAL2
			SFW AND PRT	SYSTEMS FAIL			SYS-XWP
			FAILURE OF 2/2	CMTS FOR	TRANSIENTS		SYS-CM2AB
			MANUAL ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS W/O CMT)	SYS-ADT
			MANUAL ADS ACTUA	FAILS PART'L RCS	DEPRESSURIZATION	(TRANS W/O CMT)	SYS-AD1
49	2.92E-10	.08	LOSS OF COMPONE.	COOLING SYSTEM	INITIATING EVENT OCCURS		IEV-TCW
			COND AND SFW	AND PRT SYSTEMS	FAIL		SYS-XCSP
			FAILURE OF 2/2	CMTS FOR	TRANSIENTS		SYS-CM2AB
			MANUAL ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS W/O CMT)	SYS-ADT
50	2.91E-10	.08	IEV-SL				IEV-SL
			OTH-CVCSFIX				OTH-CVCSFIX
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
			FAILURE OF	2 OF 2 GRAVITY	INJECTION LINES		SYS-IW2AB

TABLE 3
DOMINANT ACCIDENT SEQUENCE CUTSETS - INCLUDES RCS LEAK EVENT

NUMBER	SEQUENCE PROBABILITY	PERCENT CONTRIB	SEQUENCE DESCRIPTION				SEQUENCE IDENTIFIER
51	2.85E-10	.08	SPURIOUS "S"	SIGNAL	INITIATING EVENT	OCCURS	IEV-TS
			SFW AND PRT	SYSTEMS FAIL			SYS-XWP
			FAULURE OF 2/2	CMTS FOR LOCAS			SYS-CM2L
			MANUAL ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS W/O CMT)	SYS-ADT
			MANUAL ADS ACTUA	FAILS PART'L RCS	DEPRESSURIZATION	(TRANS W/O CMT)	SYS-AD1
52	2.71E-10	.08	PASSIVE RHR TUBE	RUPTURE	INITIATING EVENT	OCCURS	IEV-S2P
			CSLOCA AND PRI1	TOP EVENT NODES	FAIL		SYS-XCSLPRI1
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(S2 W/PRHR & CMT	SYS-ADS
			AUTOMATIC ADS	ACT. FAILS PARTL	RCS DEPRESSURIZ.	(S2 W/PRHR & CMT	SYS-ADV
53	2.59E-10	.07	LOSS OF OFFSITE	POWER	INITIATING EVENT	OCCURS	IEV-TE
			COMMON CAUSE	FAILURE	BATTERY		CCX-BY-PN
			FAILURE OF PRHR	TO REMOVE DECAY	HEAT FROM RPV	(ATWS)	SYS-PRW
54	2.55E-10	.07	IEV-SL				IEV-SL
			FAILURE TO	TRIP ALL FOUR	RCS PUMPS		SYS-RCSL
			MANUAL ADS ACTUA	FAILS FULL RCS	DEPRESSUR. SLOCA	W/PRHR, W/O CMT)	SYS-ADN
			MANUAL ADS ACT.	FAILS PARTL RCS	DEPRESSUR. (S2	W/PRHR W/O CMT)	SYS-ADZ
55	2.52E-10	.07	CONSEQUENTIAL	SG TUBE RUPTURE	INITIATING EVENT	OCCURS	SYS-IECV2
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT	FROM RPV (S2)	SYS-PRL
			FAULURE OF 2/2	CMTS FOR SMALL	LOCAS		SYS-CM2SL
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
56	2.47E-10	.07	MAIN STEAMLINE	SV STUCK OPEN	INITIATING EVENT	OCCURS	IEV-TSOV
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT	FROM RPV (TRANS)	SYS-PRT
			FAULURE OF 2/2	CMTS FOR SMALL	LOCAS		SYS-CM2SL
			MANUAL ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS W/O CMT)	SYS-ADT
			MANUAL ADS ACTUA	FAILS PART'L RCS	DEPRESSURIZATION	(TRANS W/O CMT)	SYS-AD1
57	2.27E-10	.06	LOSS OF COMPRES.	AIR SYSTEM	INITIATING EVENT	OCCURS	IEV-TCA
			FAILURE OF 2/2	SFW TRAINS	-NO INSTRUMENT	AIR-	SYS-SFH
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT	FROM RPV (TRANS)	SYS-PRT
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS WITH CMT)	SYS-ADA
			AUTOMATIC ADS	ACT. FAILS PART'	RCS DEPRESSURIZ.	(TRANS WITH CMT)	SYS-AD1A
58	2.20E-10	.06	CONSEQUENTIAL	SG TUBE RUPTURE	INITIATING EVENT	OCCURS	SYS-IECV2
			DELETE NON-	SENSICAL CUTSETS	FROM V2	SEQUENCES	DEL-V2DEL
			FAILURE TO	TRIP ALL FOUR	RCS PUMPS		SYS-RCSL
			MANUAL ADS ACTUA	FAILS FULL RCS	DEPRESSUR. SLOCA	W/PRHR, W/O CMT)	SYS-ADN
			MANUAL ADS ACT.	FAILS PARTL RCS	DEPRESSUR. (S2	W/PRHR W/O CMT)	SYS-ADZ
59	1.95E-10	.05	SECONDARY TO	PRIMARY SIDE	POWER MISMATCH	IN. EVENT OCCURS	IEV-TM
			STEAM DUMP AND	MAIN CONDENSOR	AVAILABLE		DEL-COND

TABLE 3
DOMINANT ACCIDENT SEQUENCE CUTSETS - INCLUDES RCS LEAK EVENT

			FRACTION OF	POWER MISMATCH	EVENTS IN WHICH SFW IS ALSO LOST	OTH-VAL3
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT FROM RPV (TRANS)	SYS-PRT
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ. (TRANS WITH CMT)	SYS-ADA
			AUTOMATIC ADS	ACT. FAILS PART'	RCS DEPRESSURIZ. (TRANS WITH CMT)	SYS-AD1A
60	1.95E-10	.05	TURBINE/REACTOR	TRIP /L.RCS FLOW	INITIATING EVENT OCCURS	IEV-TT
			COND AND SFW	AND PRT SYSTEMS	FAIL	SYS-XCSP
			AUTOMATIC ADS	ACT FAILS FULL	RCS DEPRESSURIZ. (TRANS WITH CMT)	SYS-ADA
			AUTOMATIC ADS	ACT. FAILS PART'	RCS DEPRESSURIZ. (TRANS WITH CMT)	SYS-AD1A
61	1.95E-10	.05	SPURIOUS "S"	SIGNAL	INITIATING EVENT OCCURS	IEV-TS
			FRACTION OF	SPURIOUS S SIGN.	EVENTS IN WHICH SFW IS ALSO LOST	OTH-VAL4
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT FROM RPV (TRANS)	SYS-PRT
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ. (TRANS WITH CMT)	SYS-ADA
			AUTOMATIC ADS	ACT. FAILS PART'	RCS DEPRESSURIZ. (TRANS WITH CMT)	SYS-AD1A
62	1.90E-10	.05	PASSIVE RHR TUBE	RUPTURE	INITIATING EVENT OCCURS	IEV-S2P
			CSLOCA AND PRI1	TOP EVENT NODES	FAIL	SYS-XCSLPRI1

TABLE 3
DOMINANT ACCIDENT SEQUENCE CUTSETS - INCLUDES RCS LEAK EVENT

NUMBER	SEQUENCE PROBABILITY	PERCENT CONTRIB	SEQUENCE DESCRIPTION					SEQUENCE IDENTIFIER
			FAULURE OF 2/2	CMTS FOR SMALL	LOCAS			SYS-CM2SL
			MANUAL ADS ACTUA	FAILS FULL RCS	DEPRESSUR. SLOCA	W/PRHR,	W/O CMT)	SYS-ADN
			MANUAL ADS ACT.	FAILS PARTL RCS	DEPRESSUR. (S2	W/PRHR	W/O CMT)	SYS-ADZ
63	1.85E-10	.05	STEAM GENERATOR	TUBE RUPTURE	INITIATING EVENT	OCCURS		IEV-V2
			SGTR CONTINUES					SYS-V2CONT
			FAULURE OF 2/2	CMTS FOR SMALL	LOCAS			SYS-CM2SL
			MANUAL ADS ACTUA	FAILS FULL RCS	DEPRESSUR. SLOCA	W/PRHR,	W/O CMT)	SYS-ADN
			MANUAL ADS ACT.	FAILS PARTL RCS	DEPRESSUR. (S2	W/PRHR	W/O CMT)	SYS-ADZ
64	1.76E-10	.05	CONSEQUENTIAL	SG TUBE RUPTURE	INITIATING EVENT	OCCURS		SYS-IECV2
			FAULURE OF 2/2	CMTS FOR SMALL	LOCAS			SYS-CM2SL
			MANUAL ADS ACTUA	FAILS FULL RCS	DEPRESSUR. SLOCA	W/PRHR,	W/O CMT)	SYS-ADN
			MANUAL ADS ACT.	FAILS PARTL RCS	DEPRESSUR. (S2	W/PRHR	W/O CMT)	SYS-ADZ
65	1.73E-10	.05	LOSS OF SERVICE	WATER SYSTEM	INITIATING EVENT	OCCURS		IEV-TSW
			SFW AND PRT	SYSTEMS FAIL				SYS-XWP
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS WITH CMT)		SYS-ADA
66	1.70E-10	.05	LOSS OF FW TO	STEAM GENERATOR	INITIATING EVENT	OCCURS		IEV-TF
			FRACTION OF LOSS	OF FW EVENTS IN	WHICH CONDENSOR	IS AVAILABLE		SUC-VAL2
			STEAM DUMP AND	MAIN CONDENSOR	AVAILABLE			DEL-COND
			FWT AND SFWT	AND PRT SYSTEMS	FAIL			SYS-XWSP
			FAILURE OF 2/2	CMTS FOR	TRANSIENTS			SYS-CM2AB
			MANUAL ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS W/O CMT)		SYS-ADT
			MANUAL ADS ACTUA	FAILS PART'L RCS	DEPRESSURIZATION	(TRANS W/O CMT)		SYS-AD1
67	1.47E-10	.04	IEV-SL					IEV-SL
			FAULURE OF 2/2	CMTS FOR SMALL	LOCAS			SYS-CM2SL
			MANUAL ADS ACTUA	FAILS FULL RCS	DEPRESSUR. SLOCA	W/PRHR,	W/O CMT)	SYS-ADN
			MANUAL ADS ACT.	FAILS PARTL RCS	DEPRESSUR. (S2	W/PRHR	W/O CMT)	SYS-ADZ
68	1.34E-10	.04	PASSIVE RHR TUBE	RUPTURE	INITIATING EVENT	OCCURS		IEV-S2P
			CSLOCA AND PRI1	TOP EVENT NODES	FAIL			SYS-XCSLPRI1
			FAULURE OF 2/2	CMTS FOR SMALL	LOCAS			SYS-CM2SL
			MANUAL ADS ACTUA	FAILS FULL RCS	DEPRESSUR. SLOCA	W/PRHR,	W/O CMT)	SYS-ADN
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)		SYS-RNR
69	1.28E-10	.04	LOSS OF FW TO	STEAM GENERATOR	INITIATING EVENT	OCCURS		IEV-TF
			FRACTION OF LOSS	OF FW EVENTS IN	WHICH CONDENSOR	IS AVAILABLE		SUC-VAL2
			STEAM DUMP AND	MAIN CONDENSOR	AVAILABLE			DEL-COND
			FRACTION OF LOSS	OF FW WITH BOTH	FW PUMPS LOST			OTH-VAL1
			SFWT AND PRT	SYSTEMS FAIL				SYS-XSP
			FAILURE OF 2/2	CMTS FOR	TRANSIENTS			SYS-CM2AB
			MANUAL ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS W/O CMT)		SYS-ADT
			MANUAL ADS ACTUA	FAILS PART'L RCS	DEPRESSURIZATION	(TRANS W/O CMT)		SYS-AD1

TABLE 3
DOMINANT ACCIDENT SEQUENCE CUTSETS - INCLUDES RCS LEAK EVENT

70	1.13E-10	.03	VERY SMALL LOCA	INITIATING EVENT	OCCURS		IEV-S2S
			ADZ EVENT TREE	NODE IS	SUCCESSFUL	(AUTO DEPRESS.)	DEL-ADZ
			FAILURE TO	TRIP ALL FOUR	RCS PUMPS		SYS-RCSL
			MANUAL ADS ACTUA	FAILS FULL RCS	DEPRESSUR. SLOCA W/PRHR, W/O CMT)		SYS-ADN
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
71	1.07E-10	.03	SMALL LOCA	INITIATING EVENT	OCCURS		IEV-S2
			FAILURE TO	TRIP ALL FOUR	RCS PUMPS		SYS-RCSL
			MANUAL ADS ACTUA	FAILS FULL RCS	DEPRESSUR. SLOCA W/PRHR, W/O CMT)		SYS-ADN
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
72	9.86E-11	.03	PASSIVE RHR TUBE	RUPTURE	INITIATING EVENT	OCCURS	IEV-S2P
			CSLOCA AND PRI1	TOP EVENT NODES	FAIL		SYS-XCSLPRI1
			FAILURE TO	TRIP ALL FOUR	RCS PUMPS		SYS-RCSL
			MANUAL ADS ACTUA	FAILS FULL RCS	DEPRESSUR. SLOCA W/PRHR, W/O CMT)		SYS-ADN
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR

TABLE 3
DOMINANT ACCIDENT SEQUENCE CUTSETS - INCLUDES RCS LEAK EVENT

NUMBER	SEQUENCE PROBABILITY	PERCENT CONTRIB	SEQUENCE DESCRIPTION	SEQUENCE IDENTIFIER
73	9.35E-11	.03	TURBINE/REACTOR TRIP /L.RCS FLOW INITIATING EVENT OCCURS STEAM DUMP AND MAIN CONDENSOR AVAILABLE FWT AND SFWTD AND PRT SYSTEMS FAIL AUTOMATIC ADS ACT. FAILS FULL RCS DEPRESSURIZ. (TRANS WITH CMT) AUTOMATIC ADS ACT. FAILS PART' RCS DEPRESSURIZ. (TRANS WITH CMT)	IEV-TT DEL-COND SYS-XFSP SYS-ADA SYS-AD1A
74	9.31E-11	.03	VERY SMALL LOCA INITIATING EVENT OCCURS FAULURE OF 2/2 CMTS FOR SMALL LOCAS FAILURE OF THE PRHR SYSTEM TO REMOVE DEC. HEAT FROM RPV (TRANS) MANUAL ADS ACT. FAILS FULL RCS DEPRESUR. S2 W/O PRHR & CMT) MANUAL ADS ACT. FAILS PARTL RCS DEPRESSURIZ. (S2 W/O PRHR/CMT	IEV-S2S SYS-CM2SL SYS-PRT SYS-ADC SYS-ADY
75	9.17E-11	.03	LOSS OF OFFSITE POWER INITIATING EVENT OCCURS GRID IS NOT RECOVERED WITHIN 30 MINUTES FOLLOWING LOSP GRID IS NOT RECOVERED WITHIN 24 HOURS FOLLOW- ING LOSP FAILURE OF THE PRHR SYSTEM TO REMOVE DEC. HEAT FROM RPV (S.B) FAULURE OF 2/2 CMTS FOR TE MANUAL ADS ACT. FAILS FULL RCS DEPRESSURIZ. (BLKOUT W/O CMT)	IEV-TE OTH-R05 OTH-R24 SYS-PRB SYS-CM2P SYS-ADB
76	8.10E-11	.02	LOSS OF COMPONE. COOLING SYSTEM INITIATING EVENT OCCURS COND AND SFW AND PRT SYSTEMS FAIL AUTOMATIC ADS ACT. FAILS FULL RCS DEPRESSURIZ. (TRANS WITH CMT)	IEV-TCW SYS-XCSP SYS-ADA
77	7.53E-11	.02	LOSS OF FW TO STEAM GENERATOR INITIATING EVENT OCCURS COND AND SFW AND PRT SYSTEMS FAIL AUTOMATIC ADS ACT. FAILS FULL RCS DEPRESSURIZ. (TRANS WITH CMT) AUTOMATIC ADS ACT. FAILS PART' RCS DEPRESSURIZ. (TRANS WITH CMT)	IEV-TF SYS-XCSP SYS-ADA SYS-AD1A
78	7.51E-11	.02	MAIN STEAMLINE BREAK U/MSIV INITIATING EVENT OCCURS FAILURE OF THE PRHR SYSTEM TO REMOVE DEC. HEAT FROM RPV (TRANS) FAULURE OF 2/2 CMTS FOR SMALL LOCAS MANUAL ADS ACT. FAILS FULL RCS DEPRESSURIZ. (TRANS W/O CMT) MANUAL ADS ACTUA FAILS PART'L RCS DEPRESSURIZATION (TRANS W/O CMT)	IEV-TSLU SYS-PRT SYS-CM2SL SYS-ADT SYS-AD1
79	7.11E-11	.02	MEDIUM LOCA INITIATING EVENT OCCURS RNS FAILS TO OPERATE IN INJECTION MODE (LOCA/TRANSIENT) FAILURE OF RECIRCULATION	IEV-S1 SYS-RNR SYS-RECIRC
[illegible]	6.77E-11	.02	SAFETY INJECTION LINE BREAK INITIATING EVENT OCCURS FAILURE OF 1/1 CMTS MANUAL ADS ACT. FAILS FULL RCS DEPRESSURIZATION (S1 W/O CMT)	IEV-S1S SYS-CM1A SYS-ADQ
81	6.77E-11	.02	VERY SMALL LOCA INITIATING EVENT OCCURS RNS FAILS TO OPERATE IN INJECTION MODE (LOCA/TRANSIENT) FAILURE OF RECIRCULATION	IEV-S2S SYS-RNR SYS-RECIRC

TABLE 3
DOMINANT ACCIDENT SEQUENCE CUTSETS - INCLUDES RCS LEAK EVENT

82	6.75E-11	.02	LOSS OF FW TO FRACTION OF LOSS	STEAM GENERATOR OF FW EVENTS IN	INITIATING EVENT OCCURS WHICH CONDENSOR	IS ALSO LOST	IEV-TF OTH-VAL2
			SFW AND PRT AUTOMATIC ADS AUTOMATIC ADS	SYSTEMS FAIL ACT. FAILS FULL ACT. FAILS PART'	RCS DEPRESSURIZ. RCS DEPRESSURIZ.	(TRANS WITH CMT) (TRANS WITH CMT)	SYS-XWP SYS-ADA SYS-ADIA
83	6.40E-11	.02	SMALL LOCA RNS FAILS TO FAILURE OF	INITIATING EVENT OPERATE IN RECIRCULATION	OCCURS INJECTION MODE	(LOCA/TRANSIENT)	IEV-S2 SYS-RNR SYS-RECIRC
84	5.88E-11	.02	MAIN STEAMLINE FAILURE OF THE AUTOMATIC ADS AUTOMATIC ADS	SV STUCK OPEN PRHR SYSTEM TO ACT. FAILS FULL ACT. FAILS PART'	INITIATING EVENT OCCURS REMOVE DEC. HEAT RCS DEPRESSURIZ. RCS DEPRESSURIZ.	FROM RPV (TRANS) (TRANS WITH CMT) (TRANS WITH CMT)	IEV-TSOV SYS-PRT SYS-ADA SYS-ADIA
85	5.12E-11	.01	SECONDARY TO STEAM DUMP AND	PRIMARY SIDE MAIN CONDENSOR	POWER MISMATCH AVAILABLE	IN. EVENT OCCURS	IEV-TM DEL-COND

TABLE 3
DOMINANT ACCIDENT SEQUENCE CUTSETS - INCLUDES RCS LEAK EVENT

NUMBER	SEQUENCE PROBABILITY	PERCENT CONTRIB	SEQUENCE DESCRIPTION				SEQUENCE IDENTIFIER
			SFWT AND PRT	SYSTEMS FAIL			SYS-XSP
			FAILURE OF 2/2	CMTS FOR	TRANSIENTS		SYS-CM2AB
			MANUAL ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS W/O CMT)	SYS-ADT
			MANUAL ADS ACTUA	FAILS PART'L RCS	DEPRESSURIZATION	(TRANS W/O CMT)	SYS-AD1
86	5.05E-11	.01	CONSEQUENTIAL	SG TUBE RUPTURE	INITIATING EVENT	OCCURS	SYS-IECV2
			DELETE NON-	SENSICAL CUTSETS	FROM V2	SEQUENCES	DEL-V2DEL
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(S2 W/PRHR & CMT	SYS-ADS
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
87	4.24E-11	.01	VERY SMALL LOCA	INITIATING EVENT	OCCURS		IEV-S2S
			FAILURE TO	TRIP ALL FOUR	RCS PUMPS		SYS-RCSL
			FAILURE OF 2 OF	2 ACCUMULATORS			AC2AB-FAILS
88	4.02E-11	.01	SMALL LOCA	INITIATING EVENT	OCCURS		IEV-S2
			FAILURE TO	TRIP ALL FOUR	RCS PUMPS		SYS-RCSL
			FAILURE OF 2 OF	2 ACCUMULATORS			AC2AB-FAILS
89	3.82E-11	.01	LOSS OF FEEDWAT.	WITHOUT SCRAM	INITIATING EVENT	OCCURS	IEV-TFA
			SYS-XCM				SYS-XCM
			OTH-M				OTH-M
90	3.78E-11	.01	LARGE LOCA	INITIATING EVENT	OCCURS		IEV-A
			FAILURE OF	RECIRCULATION			SYS-RECIRC
91	3.47E-11	.01	SMALL LOCA	INITIATING EVENT	OCCURS		IEV-S2
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT	FROM RPV (S2)	SYS-PRL
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS WITH CMT)	SYS-ADA
			AUTOMATIC ADS	ACT. FAILS PART'	RCS DEPRESSURIZ.	(TRANS WITH CMT)	SYS-AD1A
92	3.38E-11	.01	LOSS OF FW TO	STEAM GENERATOR	INITIATING EVENT	OCCURS	IEV-TF
			FRACTION OF LOSS	OF FW EVENTS IN	WHICH CONDENSOR	IS AVAILABLE	SUC-VAL2
			STEAM DUMP AND	MAIN CONDENSOR	AVAILABLE		DEL-COND
			FWT AND SFWT	AND PRT SYSTEMS	FAIL		SYS-XWSP
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS WITH CMT)	SYS-ADA
			AUTOMATIC ADS	ACT. FAILS PART'	RCS DEPRESSURIZ.	(TRANS WITH CMT)	SYS-AD1A
93	3.34E-11	.01	SAFETY INJECTION	LINE BREAK	INITIATING EVENT	OCCURS	IEV-S1S
			FAILURE OF 1/1	CMTS			SYS-CM1A
			FAILURE OF 1 OF	1 ACCUMULATORS			AC1A-FAILS
94	3.32E-11	.01	LOSS OF OFFSITE	POWER	INITIATING EVENT	OCCURS	IEV-TE
			GRID IS NOT	RECOVERED WITHIN	30 MINUTES	FOLLOWING LOSP	OTH-R05
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT	FROM RPV (LOSP)	SYS-PRP
			FAILURE OF SFW	TO SUPPLY SG A	FROM CST -	NO DST	SYS-SFWP
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(TE)	SYS-RNP

TABLE 3
DOMINANT ACCIDENT SEQUENCE CUTSETS - INCLUDES RCS LEAK EVENT

			FAILURE OF	2 OF 2 GRAVITY	INJECTION LINES		SYS-IW2AB
95	3.10E-11	.01	IEV-SL				IEV-SL
			OTH-CVCSFIX				OTH-CVCSFIX
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(S2 W/PRHR & CMT	SYS-ADS
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(LOCA/TRANSIENT)	SYS-RNR
96	3.03E-11	.01	CONSEQUENTIAL	MSL SV STUCK	OPEN INITIATING	EVENT OCCURS	SYS-IECTSOV
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT	FROM RPV (TRANS)	SYS-PRT
			FAULURE OF 2/2	CMTS FOR SMALL	LOCAS		SYS-CM2SL
			FAILURE OF 2 OF	2 ACCUMULATORS			AC2AB-FAILS
97	2.63E-11	.01	LOSS OF FW TO	STEAM GENERATOR	INITIATING EVENT	OCCURS	IEV-TF
			FRACTION OF LOSS	OF FW EVENTS IN	WHICH CONDENSOR	IS AVAILABLE	SUC-VAL2
			STEAM DUMP AND	MAIN CONDENSOR	AVAILABLE		DEL-COND
			FRACTION OF LOSS	OF FW WITH BOTH	FW PUMPS LOST		OTH-VAL1
			SFWT AND PRT	SYSTEMS FAIL			SYS-XSP

TABLE 3
DOMINANT ACCIDENT SEQUENCE CUTSETS - INCLUDES RCS LEAK EVENT

NUMBER	SEQUENCE PROBABILITY	PERCENT CONTRIB	SEQUENCE DESCRIPTION				SEQUENCE IDENTIFIER
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS WITH CMT)	SYS-ADA
			AUTOMATIC ADS	ACT. FAILS PART'	RCS DEPRESSURIZ.	(TRANS WITH CMT)	SYS-AD1A
98	2.51E-11	.01	LOSS OF OFFSITE	POWER	INITIATING EVENT	OCCURS	IEV-TE
			GRID IS NOT	RECOVERED WITHIN	30 MINUTES	FOLLOWING LOSP	OTH-R05
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT	FROM RPV (LOSP)	SYS-PRP
			FAILURE OF SFW	TO SUPPLY SG A	FROM CST -	NO DST	SYS-SFWP
			FAULURE OF 2/2	CMTS FOR TE			SYS-CM2P
			MANUAL ADS ACTUA	FAILS FULL RCSL	DEPRESSURIZATION	(TE W/O CMT)	SYS-ADL
			RNS FAILS TO	OPERATE IN	INJECTION MODE	(TE)	SYS-RNP
99	2.40E-11	.01	LOSS OF OFFSITE	POWER	INITIATING EVENT	OCCURS	IEV-TE
			GRID IS NOT	RECOVERED WITHIN	30 MINUTES	FOLLOWING LOSP	OTH-R05
			GRID IS NOT	RECOVERED WITHIN	24 HOURS FOLLOW-	ING LOSP	OTH-R24
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT	FROM RPV (S.B)	SYS-PRB
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(BLKOUT WITH CMT	SYS-ADAB
100	2.36E-11	.01	VERY SMALL LOCA	INITIATING EVENT	OCCURS		IEV-S2S
			FAILURE OF THE	PRHR SYSTEM TO	REMOVE DEC. HEAT	FROM RPV (TRANS)	SYS-PRT
			AUTOMATIC ADS	ACT. FAILS FULL	RCS DEPRESSURIZ.	(TRANS WITH CMT)	SYS-ADA
			AUTOMATIC ADS	ACT. FAILS PART'	RCS DEPRESSURIZ.	(TRANS WITH CMT)	SYS-AD1A

TABLE 4
INITIATING EVENT IMPORTANCES FOR RISK - DECREASE MEASURE

SYSTEM UNAVAILABILITY (Q) = 3.358E-07
NUMBER OF BASIC EVENTS = 23
NUMBER OF CUTSETS = 9900

	BASIC EVENT	IMPORTANCE (%DECREASE)	NUMBER OF CUTSETS	DECREASE IN SYSTEM UNAVAILABILITY	BASIC EVENT PROBABILITY
1	IEV-S1S	21.60	284	7.2533E-08	1.2000E-04
2	IEV-TFA	13.78	378	4.6266E-08	5.3000E-01
3	IEV-TT	12.75	705	4.2808E-08	1.4000E+00
4	IEV-S2P	12.41	1601	4.1669E-08	5.0000E-03
5	IEV-VR	8.93	1	3.0000E-08	3.0000E-08
6	IEV-S2	6.85	877	2.3013E-08	5.2000E-04
7	IEV-TF	5.42	1225	1.8184E-08	5.0570E-01
8	IEV-A	4.73	114	1.5867E-08	9.7000E-05
9	IEV-S2S	3.54	897	1.1882E-08	5.5000E-04
10	IEV-S1	3.53	960	1.1836E-08	5.6000E-04
11	IEV-TS	1.31	399	4.4149E-09	8.5000E-02
12	IEV-TE	.86	956	2.8769E-09	8.6000E-02
13	IEV-TM	.83	242	2.7726E-09	5.4000E-02
14	IEV-S1C	.81	448	2.7079E-09	1.3000E-04
15	IEV-V2	.78	123	2.6053E-09	5.2000E-01
16	IEV-SL	.47	102	1.5733E-09	6.4800E-05
17	IEV-TCA	.40	145	1.3423E-09	1.4400E-02
18	IEV-TSW	.35	176	1.1766E-09	2.6200E-02
19	IEV-TSOV	.26	132	8.6466E-10	1.2000E-03
20	IEV-TP	.21	17	7.0750E-10	4.5000E-03
21	IEV-TCW	.11	44	3.7587E-10	1.3500E-02
22	IEV-TSLU	.06	60	2.1309E-10	3.3000E-04
23	IEV-TSLD	.02	14	8.0270E-11	6.0000E-04

TABLE 4
INITIATING EVENT IMPORTANCES FOR RISK - INCREASE MEASURE

SYSTEM UNAVAILABILITY (Q) = 3.358E-07
NUMBER OF BASIC EVENTS = 23
NUMBER OF CUTSETS = 9900

	BASIC EVENT	IMPORTANCE (%INCREASE)	NUMBER OF CUTSETS	INCREASE IN SYSTEM UNAVAILABILITY	BASIC EVENT PROBABILITY
1	IEV-VR	2.978244E+08	1	1.0000E+00	3.0000E-08
2	IEV-S1S	179996.	284	6.04 7E-04	1.2000E-04
3	IEV-A	48712.4	114	1.63 6E-04	9.7000E-05
4	IEV-S2	13173.7	877	4.4233E-05	5.2000E-04
5	IEV-SL	7230.46	102	2.4278E-05	6.4800E-05
6	IEV-S2S	6430.30	897	2.1591E-05	5.5000E-04
7	IEV-S1	6291.28	960	2.1124E-05	5.6000E-04
8	IEV-S1C	6202.89	448	2.0827E-05	1.3000E-04
9	IEV-S2P	2469.57	1601	8.2920E-06	5.0000E-03
10	IEV-TSOV	214.339	132	7.1968E-07	1.2000E-03
11	IEV-TSLU	190.518	60	6.3970E-07	3.3300E-04
12	IEV-V2	148.439	123	4.9841E-07	5.2000E-03
13	IEV-TP	46.6139	17	1.5651E-07	4.5000E-03
14	IEV-TSLD	39.8200	14	1.3370E-07	6.0000E-04
15	IEV-TCA	27.3614	145	9.1871E-08	1.4400E-02
16	IEV-TM	14.4661	242	4.8573E-08	5.4000E-02
17	IEV-TS	14.1541	399	4.7525E-08	8.5000E-02
18	IEV-TSW	13.0248	176	4.3733E-08	2.6200E-02
19	IEV-TFA	12.2192	378	4.1028E-08	5.3000E-01
20	IEV-TE	9.10615	956	3.0576E-08	8.6000E-02
21	IEV-TCW	8.18007	44	2.7466E-08	1.3500E-02
22	IEV-TF	5.29349	1225	1.7774E-08	5.0570E-01

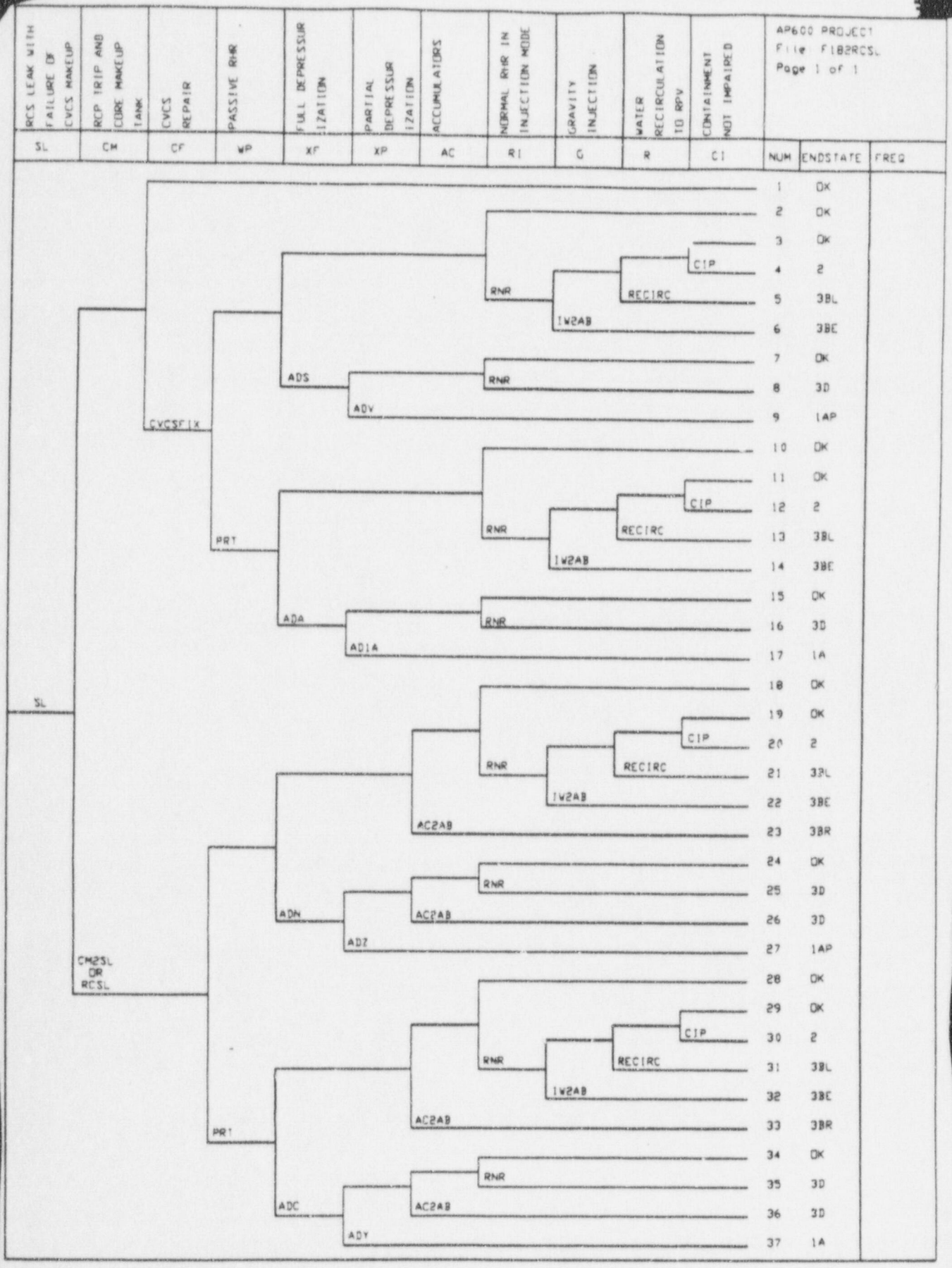

FIGURE 1

REACTOR COOLANT SYSTEM LEAK EVENT TREE

Westinghouse Electric Corporation Energy Systems

Box 355
Pittsburgh Pennsylvania 15230-0355

DCP/NRC1413
NSD-NRC-98-5757
Docket No.: 52-003

August 14, 1998

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: T. R. Quay

SUBJECT: RESPONSE TO NRC LETTERS CONCERNING REQUEST FOR WITHHOLDING INFORMATION

Reference:

1. Letter, Sebrosky to McIntyre, "Request for withholding information from public disclosure for Westinghouse AP600 design letter of October 20, 1993," dated June 18, 1998.

2. Letter, Sebrosky to McIntyre, "Request for withholding information from public disclosure for Westinghouse AP600 design letter of January 17, 1994," dated June 18, 1998.

3. Letter, Sebrosky to McIntyre, "Request for withholding information from public disclosure for Westinghouse AP600 letters of September 20, 1993, January 21, 1994, and February 3, 1994," dated July 10, 1998.

4. Letter, Sebrosky to McIntyre, "Request for withholding proprietary information for Westinghouse letters dated April 18, 1995," dated July 15, 1998.

5. Letter, Huffman to McIntyre, "Request for withholding information from public disclosure of Westinghouse report on AP600 function based task analysis," dated July 17, 1998.

Dear Mr. Quay:

Reference 1 provided the NRC assessment of the Westinghouse claim that proprietary information was provided in a letter dated October 20, 1993, that contained the response to a staff request for additional information regarding the AP600 probabilistic risk assessment. The NRC assessment was that the material was similar to material that exists in the current (1998) nonproprietary version of the AP600 probabilistic risk assessment (PRA) report. In addition, the staff indicated the material was used by the staff in the development of the AP600 draft safety evaluation report and therefore should remain on the docket. At the time this request for additional information response was provided to the

9808200168 Apr

Enclosure 2

NRC technical staff, the information was considered to be proprietary by Westinghouse since it contained information that had commercial value to Westinghouse. If this request for additional information response was indeed used by the staff in development of the AP600 draft final safety evaluation report in November 30, 1994, then at this time, almost five years later this information is no longer considered to be proprietary by Westinghouse.

Reference 2 provided the NRC assessment of the Westinghouse claim that proprietary information was provided in a letter dated January 17, 1994, that contained the response to a staff request for additional information regarding the AP600 instrumentation and control system. The NRC assessment was that the material was similar to material that exists in the current (1998) nonproprietary version of the AP600 standard safety analysis report. In addition, the staff indicated the material was used by the staff in the development of the AP600 draft safety evaluation report and therefore should remain on the docket. At the time this request for additional information response was provided to the NRC technical staff, the information was considered to be proprietary by Westinghouse since it contained information that had commercial value to Westinghouse. If this request for additional information response was indeed used by the staff in development of the AP600 draft final safety evaluation report in November 30, 1994, then at this time, over four years later, this information is no longer considered to be proprietary by Westinghouse.

Reference 3 provided the NRC assessment of the Westinghouse claim that proprietary information was provided in a letter dated September 20, 1993, that contained information related to the AP600 PRA and WCAP-13795, which provided the PRA uncertainty analysis. The NRC assessment was that the material was similar to material that exists in the current (1998) nonproprietary version of the AP600 probabilistic risk assessment (PRA) report. In addition, the staff indicated the material was used by the staff in the development of the AP600 draft safety evaluation report and therefore should remain on the docket. At the time this information was provided to the NRC technical staff, it was considered to be proprietary by Westinghouse since it contained information that had commercial value to Westinghouse. If the information transmitted by the Westinghouse September 20, 1993, letter was indeed used by the staff in development of the AP600 draft final safety evaluation report in November 30, 1994, then at this time, almost five years later, this information is no longer considered to be proprietary by Westinghouse.

Reference 3 also provided the NRC assessment of the Westinghouse claim that proprietary information was provided in a letter dated January 21, 1994, that contained WCAP-13913, "Framework for AP600 Severe Accident Management Guidance" (SAMG). The NRC assessment was that the material was similar to material that exists in current (1998) nonproprietary AP600 documents (e.g., WCAP-13914, "Framework for AP600 Severe Accident Management Guidance"). In addition, the staff indicated the material was used by the staff in the development of the AP600 draft safety evaluation report and therefore should remain on the docket. At the time this Framework for SAMG was provided to the NRC technical staff, the information was considered to be proprietary by Westinghouse since it contained information that had commercial value to Westinghouse. At this time, over four years later, this information is no longer considered to be proprietary by Westinghouse.

1790a.wpf

Reference 3 also provided the NRC assessment of the Westinghouse claim that proprietary information was provided in a letter dated February 3, 1994, that contained additional copies of WCAP-13915, "Framework for AP600 Severe Accident Management Guidance" (SAMG). The NRC assessment was that the material was similar to material that exists in current (1998) non-proprietary AP600 documents (e.g., WCAP-13914, "Framework for AP600 Severe Accident Management Guidance"). In addition, the staff indicated the material was used by the staff in the development of the AP600 draft safety evaluation report and therefore should remain on the docket. At the time this Framework for SAMG was provided to the NRC technical staff, the information was considered to be proprietary by Westinghouse since it contained information that had commercial value to Westinghouse. At this time, over four years later, this information is no longer considered to be proprietary by Westinghouse

Reference 4 provided the NRC assessment of the Westinghouse claim that proprietary information was provided in a letter dated April 18, 1995, that contained information for a MAAP4/RELAP comparison for the AP600 in response to a staff request for additional information. The NRC assessment was that the Westinghouse cover letter indicated that Enclosure 2 is a non-proprietary version of Enclosure 3, however, the staff could not find any portion of the enclosures marked as proprietary. The staff assessment further states the conventional bracketed-superscript notation also appears to be missing. Finally, the NRC assessment states the staff could not determine which part of the material enclosed with the Westinghouse letter was Enclosure 1, 2, or 3. It should be noted that the Westinghouse April 18, 1995, cover letter states "Enclosures 2 (nonproprietary) and 3 (proprietary) provide the requested information." The letter does not indicate that enclosure 2 was a duplicate of enclosure 3 minus the proprietary information. A cover sheet was provided just prior to each of the enclosures to the Westinghouse letter. The enclosures contained the following: Enclosure 1 provided a copy of the NRC's two-page request for information for the MAAP-RELAP comparison. Enclosure 2 provided the requested information, and was titled "Requested Information for AP600 MAAP4/RELAP Comparison." Under section 4, Initial Conditions, of Enclosure 2 it states the initial conditions information (which was proprietary) is provided in Enclosure 3 of the subject Westinghouse letter. Finally, Enclosure 3 contained the list of initial conditions. The information provided in Enclosure 3 was labeled as Westinghouse Proprietary Class 2 at the top of the page, however, the specific proprietary information was not indicated by the bracketed-superscripted notation. In addition to the initial conditions, a mark-up of AP600 PRA Figure K-1 was provided in Enclosure 3. Again, the information was labeled as Westinghouse Proprietary Class 2 at the top of the page, however, the specific proprietary information was not indicated by the bracketed-superscripted notation. At the time the information provided in Enclosure 3 of the subject Westinghouse letter was provided to the NRC technical staff, the information was considered to be proprietary by Westinghouse since it contained information that had commercial value to Westinghouse. At this time, over three years later, this information is no longer considered to be proprietary by Westinghouse.

Reference 5 provided the NRC assessment of the Westinghouse claim that proprietary information was provided in a letter dated February 8, 1994, provided a copy of WCAP-13957, "AP600 Reactor Coolant System Mass Inventory: Function Based Risk Analysis." The NRC assessment was that the material was not "information that the staff customarily accepts as proprietary." In addition, the staff indicated the material was used by the staff in the development of the AP600 final safety evaluation report and therefore should remain on the docket. At the time this report was prepared, the

information was considered to be proprietary by Westinghouse since it contained information that had commercial value to Westinghouse and was of the type of information that was customarily held in confidence by Westinghouse. That the material was not information that the staff customarily accepts as proprietary is not relevant to making the proprietary determination. However, in an effort to expedite the issuance of the AP600 Final Safety Evaluation Report and Final Design Approval, Westinghouse agrees to no longer consider this information to be proprietary.

In a telephone call on July 8, 1998, the staff informed Westinghouse of a concern related to WCAP-13288 and WCAP-13289, which were associated with the AP600 check valve testing specification. The concern was that the proprietary report had no proprietary information identified and the nonproprietary report had been placed in the public document room. Westinghouse has reviewed these reports and, at this time, considers none of the information to be proprietary.

This response addresses the proprietary issues delineated in the references.

Brian A. McIntyre, Manager
Advanced Plant Safety and Licensing

jml

cc: J. W. Roe - NRC/NRR/DRPM
J. M. Sebrosky - NRC/NRR/DRPM
W. C. Huffman - NRC/NRR/DRPM
H. A. Sepp - Westinghouse

1790a.wpf