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# DATABASE FOR PROBABILISTIC RISK ASSESSMENT OF LIGHT WATER NUCLEAR POWER PLANTS

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Maintenance Data

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**PLG**

**Pickard, Lowe and Garrick, Inc.**

Newport Beach • CA  
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ENGINEERS ■ APPLIED SCIENTISTS ■ MANAGEMENT CONSULTANTS

GENERIC DATA FOR MAINTENANCE DURATIONS

Sheet 1 of 4

ZMPLSD

Maintenance Duration: Pumps — 168-Hour Technical Specifications

Discrete Probability Distribution:

Bin	Mean Maintenance Duration	Probability	Cumulative Probability
1	1.7687E + 00	1.6045E-02	1.6045E-02
2	2.6458E + 00	3.6537E-02	5.2582E-02
3	4.1833E + 00	4.8339E-02	1.0092E-01
4	6.1237E + 00	9.0037E-02	1.9096E-01
5	8.6603E + 00	8.9113E-02	2.8007E-01
6	1.1180E + 01	8.1864E-02	3.6193E-01
7	1.3693E + 01	7.2748E-02	4.3468E-01
8	1.7321E + 01	1.1898E-01	5.5366E-01
9	2.2361E + 01	8.9615E-02	6.4328E-01
10	2.7386E + 01	6.7749E-02	7.1102E-01
11	3.4641E + 01	9.1991E-02	8.0302E-01
12	4.8990E + 01	9.3575E-02	8.9659E-01
13	7.3485E + 01	5.5133E-02	9.5172E-01
14	1.0817E + 02	2.6318E-02	9.7804E-01
15	1.4866E + 02	1.0279E-02	9.8832E-01
16	2.0616E + 02	7.3410E-03	9.9566E-01
17	2.7388E + 02	1.7124E-03	9.9737E-01
18	3.2404E + 02	9.3734E-04	9.9831E-01
19	3.7417E + 02	5.5134E-04	9.9886E-01
20	4.5910E + 02	1.1379E-03	1.0000E + 00

Mean	Variance	5th Percentile	50th Percentile	95th Percentile
2.8694E + 01	1.3667E + 03	2.5838E + 00	1.5684E + 01	7.2719E + 01

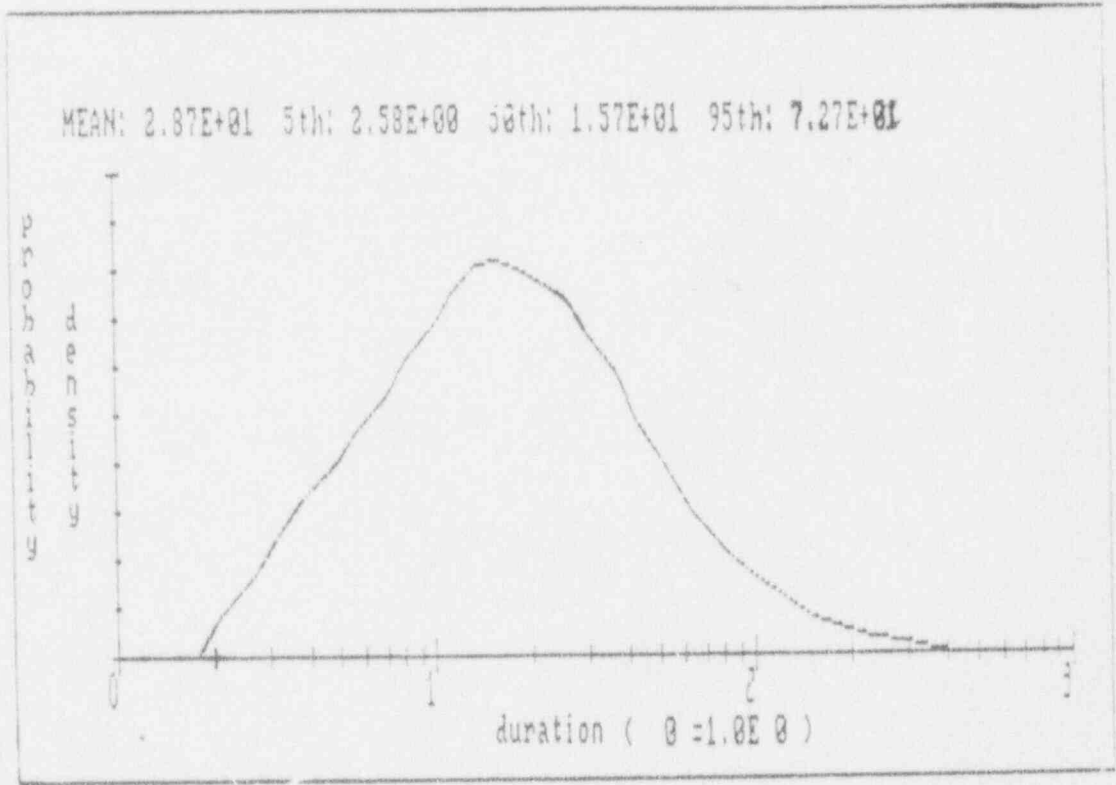
Type: DPD

Reference: PGE.1123 > DATA.PHASE3 > MAINT.REV1 (Diablo)

GENERIC DATA FOR MAINTENANCE DURATIONS

ZMPLSD

Sheet 2 of 4



## GENERIC DATA FOR MAINTENANCE DURATIONS

ZMPLSD

Sheet 3 of 4

Description: This distribution was developed using the following data:

Plant	Component	Tech. Specs.	No. of Events	Duration (hours)	Mean	Std. Dev.	Median	Range Factor
Zion	CS PUMPS	168	7	8 8 4 11 34 19 5	12.71	9.82	12.20	1.60
OCON	RB Spray Pump A or B	168	4	34 5 14 5	14.50	11.84	13.42	1.91
Zion	CS Pumps	168	4	24 24 8 17	18.25	6.57	17.96	1.34
Zion	Centrifugal Chrg Pumps	168	17	48 8 48 96 8 8 8 8 18 8 8 72 8 78 61 15 56 11	34.65	29.35	33.94	1.40
TMI-2	Fuel Oil Transfer	168	2	1.25 3.25	2.25	1.00	2.15	1.56
Zion	SI Pumps	168	1	24	24.00	0.00	24.00	2.00
Zion	RHR Pumps	168	6	72 75 96 72 48 97	77.33	16.61	77.04	1.15

# GENERIC DATA FOR MAINTENANCE DURATIONS

ZMIPLSD

Sheet 4 of 4

Plant	Component	Tech. Specs.	No. of Events	Duration (hours)	Mean	Std. Dev.	Median	Range Factor
Zion	SW Pumps	168	24	8 24 24 8 8 8 8 24 8 8 24 8 8 8 3 19 96 9 6 30 8 9 12 11	15.79	18.23	15.37	1.47

## Attachment C - PCC System Results

This section contains the details of the PCC system quantification for maintenance. Results are presented for the Baseline case, the New TS case, and the Sensitivity case #1, in the following tables:

<p>Table C.1 Maintenance Alignment Definitions - BASE CASE                  Table C.2 Maintenance Alignment Definitions - NEW TS CASE                  Table C.3 Maintenance Alignment Definitions - SENSITIVITY CASE #1</p>	<p>These tables present the equation for the maintenance alignment in terms of data variables. They also show the impact of the maintenance alignment, i.e. what basic event is assumed failed as a result of the maintenance.</p>
<p>Table C.4 Maintenance Alignment Contributions to System Unavailability - BASE CASE                  Table C.5 Maintenance Alignment Contributions to System Unavailability - NEW TS CASE                  Table C.6 Maintenance Alignment Contributions to System Unavailability - SENSITIVITY #1</p>	<p>These tables present the maintenance contribution to system unavailability for the 3 boundary conditions discussed in the evaluation. This shows the conditional failure, the frequency of being in the alignment, the total unavailability contribution, and the importance of that alignment.</p>
<p>Table C.7 Cause Table for PCC1 (Normal Alignment) - BASE CASE                  Table C.8 Cause Table for PCC1 (Normal Alignment) - NEW TS CASE                  Table C.9 Cause Table for PCC1 (Normal Alignment) - SENSITIVITY CASE #1</p>	<p>These tables present the dominant cut sets for PCC1, normal configuration. The cut set basic events are defined in Attachment A. Note that the cutsets in [brackets] are common cause terms.</p>

TABLE C.1

MAINTA Alignment - MAINTENANCE ON PCC PUMP P-11C

Fraction of Time in the Alignment is:  
2\*ZMPOPF\*ZMPLSD = 9.0620E-03

Basic Event Impacts for MAINTA Alignment

Basic Event	State	Description
OE.CCP11C.LT	F	PUMP DISCHARGE VALVE CC-V2 NOT RE-OPENED AFTER PUMP ROTATION

MAINTB Alignment - MAINTENANCE ON PCC PUMP P-11D

Fraction of Time in the Alignment is:  
2\*ZMPOPF\*ZMPLSD = 9.0620E-03

Basic Event Impacts for MAINTB Alignment

Basic Event	State	Description
OE.CCP11D.LT	F	PUMP DISCHARGE VALVE CC-V299 NOT RE-OPENED AFTER PUMP ROTATION

NORMAL Alignment - NORMAL ALIGNMENT

Fraction of Time in the Alignment is:  
1-MAINTA-MAINTB = 9.8190E-01

TABLE C.2

MAINTA Alignment - MAINTENANCE ON PCC PUMP P-11C

Fraction of Time in the Alignment is:  
 $2 * ZMPOPF * ZMPCCD = 3.0760E-02$

Basic Event Impacts for MAINTA Alignment

Basic Event	State	Description
OE.CCP11C.LT	F	PUMP DISCHARGE VALVE CC-V2 NOT RE-OPENED AFTER PUMP ROTATION

MAINTB Alignment - MAINTENANCE ON PCC PUMP P-11D

Fraction of Time in the Alignment is:  
 $2 * ZMPOPF * ZMPCCD = 3.0760E-02$

Basic Event Impacts for MAINTB Alignment

Basic Event	State	Description
OE.CCP11D.LT	F	PUMP DISCHARGE VALVE CC-V299 NOT RE-OPENED AFTER PUMP ROTATION

PLMNTA Alignment - PLANNED MAINTENANCE ON A TRAIN PUMP

Fraction of Time in the Alignment is:  
 $2 * (1 / 4) * (1 / 8760) * 336 = 1.9180E-02$

Basic Event Impacts for PLMNTA Alignment

Basic Event	State	Description
OE.CCP11C.LT	F	PUMP DISCHARGE VALVE CC-V2 NOT RE-OPENED AFTER PUMP ROTATION

PLMNTB Alignment - PLANNED MAINTENANCE ON TRAIN B

Fraction of Time in the Alignment is:  
 $2 * (1 / 4) * (1 / 8760) * 336 = 1.9180E-02$

Basic Event Impacts for PLMNTB Alignment

Basic Event	State	Description
OE.CCP11D.LT	F	PUMP DISCHARGE VALVE CC-V299 NOT RE-OPENED AFTER PUMP ROTATION

NORMAL Alignment - NORMAL ALIGNMENT

Fraction of Time in the Alignment is:  
 $1 - MAINTA - MAINTB - PLMNTA - PLMNTB = 9.0010E-01$



TABLE C.3

NORMAL Alignment - NORMAL ALIGNMENT

Fraction of Time in the Alignment is:  
Constant Value: 1

(no maintenance because standby pumps are assumed to be permanently disabled - the bounding case.)

TABLE C.4

Split Fraction PCC1 - PCC SYSTEM (BOTH TRAINS) - NO LOSP, TRANSIENT OR SMALL LOCA

PE Mean = 7.2107E-07 Date : 08 FEB 1994 14:14

Alignment	Total Prob.	Frequency	Total	Importance
NORMAL	7.1270E-07	9.8190E-01	6.9980E-07	9.7050E-01
MAINTA	1.1730E-06	9.0620E-03	1.0630E-08	1.4750E-02
MAINTB	1.1730E-06	9.0620E-03	1.0630E-08	1.4750E-02

Split Fraction PCC2 - PCC SYSTEM (BOTH TRAINS) - LOSP

PE Mean = 2.7954E-06 Date : 08 FEB 1994 14:14

Alignment	Total Prob.	Frequency	Total	Importance
NORMAL	2.7800E-06	9.8190E-01	2.7290E-06	9.7620E-01
MAINTB	3.6690E-06	9.0620E-03	3.3240E-08	1.1890E-02
MAINTA	3.6690E-06	9.0620E-03	3.3240E-08	1.1890E-02

Split Fraction PCC3 - PCC SYSTEM (BOTH TRAINS) - MEDIUM OR LARGE LOCA

PE Mean = 2.2106E-05 Date : 08 FEB 1994 14:14

Alignment	Total Prob.	Frequency	Total	Importance
NORMAL	2.2090E-05	9.8190E-01	2.1690E-05	9.8150E-01
MAINTB	2.2550E-05	9.0620E-03	2.0440E-07	9.2470E-03
MAINTA	2.2550E-05	9.0620E-03	2.0440E-07	9.2470E-03

TABLE C.5

Split Fraction PCC1 - PCC SYSTEM (BOTH TRAINS) - NO LOSP, TRANSIENT OR SMALL LOCA

PE Mean = 7.5870E-07 Date : 10 FEB 1994 08:16

Alignment	Total Prob.	Frequency	Total	Importance
NORMAL	7.1270E-07	9.0010E-01	6.4150E-07	8.4550E-01
MAINTA	1.1730E-06	3.0760E-02	3.6090E-08	4.7570E-02
MAINTB	1.1730E-06	3.0760E-02	3.6090E-08	4.7570E-02
PLMNTA	1.1730E-06	1.9180E-02	2.2500E-08	2.9660E-02
PLMNTB	1.1730E-06	1.9180E-02	2.2500E-08	2.9660E-02

Split Fraction PCC2 - PCC SYSTEM (BOTH TRAINS) - LOSP

PE Mean = 2.8684E-06 Date : 10 FEB 1994 08:16

Alignment	Total Prob.	Frequency	Total	Importance
NORMAL	2.7800E-06	9.0010E-01	2.5020E-06	8.7230E-01
MAINTB	3.6690E-06	3.0760E-02	1.1290E-07	3.9340E-02
MAINTA	3.6690E-06	3.0760E-02	1.1290E-07	3.9340E-02
PLMNTB	3.6690E-06	1.9180E-02	7.0360E-08	2.4530E-02
PLMNTA	3.6690E-06	1.9180E-02	7.0360E-08	2.4530E-02

Split Fraction PCC3 - PCC SYSTEM (BOTH TRAINS) - MEDIUM OR LARGE LOCA

PE Mean = 2.2134E-05 Date : 10 FEB 1994 08:16

Alignment	Total Prob.	Frequency	Total	Importance
NORMAL	2.2090E-05	9.0010E-01	1.9890E-05	8.9820E-01
MAINTB	2.2550E-05	3.0760E-02	6.9380E-07	3.1340E-02
MAINTA	2.2550E-05	3.0760E-02	6.9380E-07	3.1340E-02
PLMNTA	2.2550E-05	1.9180E-02	4.3250E-07	1.9540E-02
PLMNTB	2.2550E-05	1.9180E-02	4.3250E-07	1.9540E-02

TABLE C.6

Split Fraction PCC1 - PCC SYSTEM (BOTH TRAINS) - NO LOSP, TRANSIENT OR SMALL LOCA

PE Mean : ~~7.1270E-07~~ <sup>6.15E-6 \*</sup> Date : 10 FEB 1994 10:30

Alignment	Total Prob.	Frequency	Total	Importance
NORMAL	<del>7.1270E-07</del> 6.15E-6	1.0000E+00	<del>7.1270E-07</del> 6.15E-6	1.0000E+00

Split Fraction PCC2 - PCC SYSTEM (BOTH TRAINS) - LOSP

PE Mean = ~~2.7000E-06~~ <sup>1.82E-5 \*</sup> Date : 10 FEB 1994 10:30

Alignment	Total Prob.	Frequency	Total	Importance
NORMAL	<del>2.7000E-06</del> 1.82E-5	1.0000E+00	<del>2.7000E-06</del> 1.82E-5	1.0000E+00

Split Fraction PCC3 - PCC SYSTEM (BOTH TRAINS) - MEDIUM OR LARGE LOCA

PE Mean = ~~2.2000E-05~~ <sup>2.75E-5 \*</sup> Date : 10 FEB 1994 10:30

Alignment	Total Prob.	Frequency	Total	Importance
NORMAL	<del>2.2000E-05</del> 2.75E-5	1.0000E+00	<del>2.2000E-05</del> 2.75E-5	1.0000E+00

\* Values are based on hand calculation. See Table C.9 for an example of this calculation.

# TABLE C.7

MODEL Name: PCC BASE

Cause Table for Top Event PCC and Split Fraction PCC1

PE Value of PCC1 = 7.2107E-07 Date : 08 FEB 1994 14:14

14:30:12 09 FEB 1994  
Page 1

No...	Cutsets.....	Value.....	% Importance	% Cumulative	Alignment...
1	[AO.CCV426.FO,AO.C CV427.FO,AO.CCV447 .FO,AO.CCV448.FO]	4.563E-07	63.2806	63.2806	NORMAL
2	[PP.CCP11C.FR,PP.C CP11D.FR,PP.CCP11B .FR,PP.CCP11A.FR]	2.327E-07	32.2713	95.5519	NORMAL
3	[AO.CCV426.FO,AO.C CV427.FO,AO.CCV447 .FO,AO.CCV448.FO]	4.211E-09	.5840	96.1359	MAINTA
4	[AO.CCV426.FO,AO.C CV427.FO,AO.CCV447 .FO,AO.CCV448.FO]	4.211E-09	.5840	96.7199	MAINTB
5	[PP.CCP11D.FR,PP.C CP11B.FR,PP.CCP11A .FR]	4.188E-09	.5808	97.3007	MAINTA
6	[PP.CCP11C.FR,PP.C CP11B.FR,PP.CCP11A .FR]	4.188E-09	.5808	97.8815	MAINTB
7	HX.CCE17A.GL * HX.CCE17B.GL	2.153E-09	.2986	98.1801	NORMAL
8	[PP.CCP11C.FR,PP.C CP11D.FR,PP.CCP11B .FR,PP.CCP11A.FR]	2.148E-09	.2979	98.4780	MAINTB
9	[PP.CCP11C.FR,PP.C CP11D.FR,PP.CCP11B .FR,PP.CCP11A.FR]	2.148E-09	.2979	98.7759	MAINTA
10	TI.CCTE2171.FZ * HX.CCE17B.GL	1.108E-09	.1537	98.9295	NORMAL

# TABLE C.8

MODEL Name: PCC CHNG

Cause Table for Top Event PCC and Split Fraction PCC1

PE Value of PCC1 = 7.5870E-07 Date : 10 FEB 1994 08:16

09:06:17 10 FEB 1994  
Page 1

No...	Cutsets.....	Value.....	% Importance	% Cumulative	Alignment...
1	[AO.CCV426.FO,AO.C CV427.FO,AO.CCV447 .FO,AO.CCV448.FO]	4.183E-07	55.1340	55.1340	NORMAL
2	[PP.CCP11C.FR,PP.C CP11D.FR,PP.CCP11B .FR,PP.CCP11A.FR]	2.133E-07	28.1140	83.2480	NORMAL
3	[AO.CCV426.FO,AO.C CV427.FO,AO.CCV447 .FO,AO.CCV448.FO]	1.429E-08	1.8835	85.1315	MAINTA
4	[AO.CCV426.FO,AO.C CV427.FO,AO.CCV447 .FO,AO.CCV448.FO]	1.429E-08	1.8835	87.0150	MAINTB
5	[PP.CCP11D.FR,PP.C CP11B.FR,PP.CCP11A .FR]	1.422E-08	1.8743	88.8892	MAINTA
6	[PP.CCP11C.FR,PP.C CP11B.FR,PP.CCP11A .FR]	1.422E-08	1.8743	90.7635	MAINTB
7	[AO.CCV426.FO,AO.C CV427.FO,AO.CCV447 .FO,AO.CCV448.FO]	8.911E-09	1.1745	91.9380	PLMNTA
8	[AO.CCV426.FO,AO.C CV427.FO,AO.CCV447 .FO,AO.CCV448.FO]	8.911E-09	1.1745	93.1125	PLMNTB
9	[PP.CCP11D.FR,PP.C CP11B.FR,PP.CCP11A .FR]	8.863E-09	1.1682	94.2807	PLMNTA
10	[PP.CCP11C.FR,PP.C CP11B.FR,PP.CCP11A .FR]	8.863E-09	1.1682	95.4489	PLMNTB

TABLE C.9

MODEL Name: PCC SENS \* 1

Cause Table for Top Event PCC and Split Fraction PCC1

PE Value of PCC1 = ~~7.1274E-07~~ <sup>6.15E-6</sup> Date : 10 FEB 1994 10:30

14:08:56 10 FEB 1994

Page 1

No...	Cutssets.....	Value.....	% Importance	% Cumulative	Alignment...
1	[AO.CCV426.FO,AO.C CV427.FO,AO.CCV447 .FO,AO.CCV448.FO]	4.647E-07	<del>7.5</del> <del>65.2024</del>	65.2024	NORMAL
2	[PP.GCP110.FR,PP.C CP110.FR,PP.CCP11A .FR,PP.CCP11A.FR]	<sup>5.67E-6 *</sup> 2.378E-07	92.2 33.2535	98.4556	NORMAL
3	HX.CCE17A.GL * HX.CCE17B.GL	2.193E-09	.03 .3077	98.7633	NORMAL
4	HX.CCE17A.GL * TI.CCTE2271.FZ	1.128E-09	.1985	98.9216	NORMAL
5	TI.CCTE2171.FZ * HX.CCE17B.GL	1.128E-09	.1563	99.0779	NORMAL
6	[PP.GCP110.FR,PP.C CP110.FR,PP.CCP11A .FR] * <del>[PP.GCP110.FZ]</del>	<del>2.378E-10</del>	.1035	99.1814	NORMAL
7	[PP.GCP110.FR,PP.C CP110.FR,PP.CCP11A .FR] * <del>[PP.GCP110.FZ]</del>	<del>7.378E-10</del>	.1035	99.2849	NORMAL
8	CV.CCV1.GL * HX.CCE17B.GL	6.022E-10	.0845	99.3714	NORMAL
9	CV.CCV298.GL * HX.CCE17A.GL	6.022E-10	.0845	99.4559	NORMAL
10	TI.CCTE2171.FZ * TI.CCTE2271.FZ	5.805E-10	.0845	99.5374	NORMAL

contained in new cutset # 2.

\* Hand calculation

$$[PP.CCP110.FR, PP.CCP11A.FR] = \beta_R \cdot P_R(24hr) = 2.4E-2 * 9.05E-6/hr * 24hr = 5.67E-6$$

## Attachment D - Initiating Event Results - Loss of One Train PCC

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This section contains the dominant cutsets for the initiator loss of one train of PCC, for the following cases:

Table D.1 Cause Table for L1PCC - BASE CASE,

Table D.2 Cause Table for L1PCC - NEW TS CASE, and

Table D.3 Cause Table for L1PCC - SENSITIVITY CASE #1

The Base Case shows that the highest frequency cutset is common cause failure of the temperature transmitters that trip both PCC pumps. This cutset is not impacted by the maintenance changes. The next cutset is failure of the operating PCC pump while the standby pump is in maintenance (MAINTA). Cutsets 3 through 7 are failures of other components that are not impacted by changes to the maintenance model. Cutset 8 is failure of the operating PCC pump with failure of the standby pump to start.

The New TS Case increases the duration of maintenance for the standby pump (MAINTA), which impacts the first cutset. The third cutset is failure of the operating PCC pump while the standby pump is in planned maintenance (PLMNTA).

The Sensitivity Case #1 is dominated by the operating pump failing to continue to run for an operating year.



TABLE D.1

1/1

MODEL Name: PCC BASE  
 Cause Table for Top Event L1CC and Split Fraction L1CC1

PE Value of L1CC1 = 2.4906E-03 Date : 15 FEB 1994 08:01

14:23:15 03 MAR 1994

Page 1

No...	Cutsets.....	Value.....	% Importance	% Cumulative	Alignment...
1	TI.CCTE2171.FZ	6.128E-04	24.6042	24.6042	NORMAL
2	PP.CCP11A.FR	2.737E-04	10.9892	35.5934	MAINTA
3	AO.CCV341.FO	2.648E-04	10.6319	46.2253	NORMAL
4	VL.CCV3.CL	2.562E-04	10.2866	56.5118	NORMAL
5	BV.CCTV21711.CL	2.562E-04	10.2866	66.7984	NORMAL
6	VL.SWV14.CL	2.562E-04	10.2866	77.0849	NORMAL
7	TK.CCTK19A.RT	1.626E-04	6.5285	83.6134	NORMAL
8	PP.CCP11A.FR * PP.CCP11C.FS	9.666E-05	3.8809	87.4944	NORMAL
9	CV.CCV1.GL	5.888E-05	2.3641	89.8584	NORMAL
10	MO.SWV15.CL	5.658E-05	2.2717	92.1301	NORMAL
11	PP.CCP11A.FR * BK.CCA5952.FC	3.905E-05	1.5679	93.6980	NORMAL
12	PP.CCP11A.FR * OE.CCP11C.LT	3.607E-05	1.4482	95.1462	NORMAL
13	BV.CCTV21712.OP	2.562E-05	1.0287	96.1749	NORMAL
14	TI.CCTE2197.FM * TI.CCTE2171.FM	2.159E-05	.8668	97.0417	NORMAL
15	PP.CCP11A.FR * PP.CCP11C.IE	1.699E-05	.6822	97.7239	NORMAL
16	PP.CCP11A.FR * CV.CCV1.IE	1.620E-05	.6504	98.3743	NORMAL
17	PP.CCP11A.FR * RL.CCA5962.FE	1.450E-05	.5822	98.9565	NORMAL
18	PP.CCP11A.FR * CV.CCV4.FO	1.099E-05	.4413	99.3978	NORMAL
19	TI.CCTE2171.FZ	2.789E-06	.1120	99.5098	MAINTA
20	AO.CCV341.FO	1.205E-06	.0484	99.5581	MAINTA
21	VL.SWV14.CL	1.166E-06	.0468	99.6049	MAINTA
22	BV.CCTV21711.CL	1.166E-06	.0468	99.6518	MAINTA
23	VL.CCV7.CL	1.166E-06	.0468	99.6986	MAINTA
24	VL.CCV5.CL	1.166E-06	.0468	99.7454	MAINTA
25	VL.CCV3.CL	1.166E-06	.0468	99.7922	MAINTA

TABLE D.2

MODEL Name: PCC CHNG

Cause Table for Top Event L1CC and Split Fraction L1CC1

PE Value of L1CC1 = 3.7482E-03 Date : 14 FEB 1994 10:50

MG/LH Value of L1CC1 = 0.0000E+00 Date :

15:14:58 14 FEB 1994

Page 1

No...	Cutsets.....	Value.....	% Importance	% Cumulative	Alignment...
1	PP.CCP11A.FR	9.290E-04	24.7855	24.7855	MAINTA
2	TI.CCTE2171.FZ	6.061E-04	16.1706	40.9561	NORMAL
3	PP.CCP11A.FR	5.792E-04	15.4529	56.4090	PLMNTA
4	AO.CCV341.FO	2.619E-04	6.9874	63.3965	NORMAL
5	VL.CCV3.CL	2.534E-04	6.7607	70.1571	NORMAL
6	BV.CCTV21711.CL	2.534E-04	6.7607	76.9178	NORMAL
7	VL.SWV14.CL	2.534E-04	6.7607	83.6784	NORMAL
8	TK.CCTK19A.RT	1.508E-04	4.2901	87.9685	NORMAL
9	PP.CCP11A.FR * PP.CCP11C.FS	9.561E-05	2.5509	90.5194	NORMAL
10	CV.CCV1.GL	5.824E-05	1.5538	92.0732	NORMAL
11	MO.SWV15.CL	5.597E-05	1.4933	93.5665	NORMAL
12	PP.CCP11A.FR * BK.CCA5952.FC	3.862E-05	1.0304	94.5968	NORMAL
13	PP.CCP11A.FR * OE.CCP11C.LT	3.568E-05	.9519	95.5488	NORMAL
14	BV.CCTV21712.OP	2.534E-05	.6761	96.2248	NORMAL
15	TI.CCTE2197.FM * TI.CCTE2171.FM	2.136E-05	.5699	96.7947	NORMAL
16	PP.CCP11A.FR * PP.CCP11C.IE	1.681E-05	.4485	97.2432	NORMAL
17	PP.CCP11A.FR * RL.CCA5962.FE	1.434E-05	.3826	97.6258	NORMAL
18	PP.CCP11A.FR * CV.CCV1.IE	1.088E-05	.2903	97.9161	NORMAL
19	PP.CCP11A.FR * CV.CCV4.FO	1.087E-05	.2900	98.2061	NORMAL
20	TI.CCTE2171.FZ	9.468E-06	.2526	98.4587	MAINTA
21	TI.CCTE2171.FZ	5.903E-06	.1575	98.6162	PLMNTA
22	AO.CCV341.FO	4.091E-06	.1091	98.7253	MAINTA
23	VL.SWV14.CL	3.958E-06	.1056	98.8309	MAINTA
24	BV.CCTV21711.CL	3.958E-06	.1056	98.9365	MAINTA
25	VL.CCV7.CL	3.958E-06	.1056	99.0421	MAINTA

TABLE D.3

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MODEL Name: PCC\_SENS

Cause Table for Top Event L1CC AND Split Fraction L1CC1

PE Value of L1CC1 = 6.2960E-02 Date : 10 FEB 1994 10:50

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No...	Cutsets.....	Value.....	% Importance	% Cumulative	Alignment...
1	PP.CCP11A.FR	6.040E-02	95.9334	95.9334	NORMAL
2	TI.CCTE2171.FZ	6.156E-04	.9778	96.9112	NORMAL
3	AO.CCV341.FO	2.660E-04	.4225	97.3337	NORMAL
4	VL.SWV14.CL	2.574E-04	.4088	97.7425	NORMAL
5	BV.CCTV21711.CL	2.574E-04	.4088	98.1513	NORMAL
6	VL.CCV7.CL	2.574E-04	.4088	98.5602	NORMAL
7	VL.CCV5.CL	2.574E-04	.4088	98.9690	NORMAL
8	VL.CCV3.CL	2.574E-04	.4088	99.3778	NORMAL
9	TK.CCTK19A.RT	1.633E-04	.2594	99.6372	NORMAL
10	CV.CCV4.CL	6.384E-05	.1014	99.7386	NORMAL
11	CV.CCV1.GL	5.915E-05	.0939	99.8326	NORMAL
12	MO.SWV15.CL	5.684E-05	.0903	99.9228	NORMAL
13	BV.CCTV21712.OP	2.574E-05	.0409	99.9637	NORMAL
14	TI.CCTE2197.FM * TI.CCTE2171.FM	2.169E-05	.0345	99.9982	NORMAL
15	AO.CCV57.FO * AO.CCV121.FO * XX.TRAINB.XX	1.157E-06	.0018	100.0000	NORMAL

## Attachment E - Plant Model Results

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This section contains the ranked list of core damage sequences for the four cases:

Table E.1 CD Sequences - BASE CASE,

Table E.2 CD Sequences - NEW TS CASE,

Table E.3 CD Sequences - SENSITIVITY CASE #1, and

Table E.4 CD Sequences - SENSITIVITY CASE #2

Each list contains the top 25 sequences, with the PCC impacted sequences highlighted.

The relationship between split fractions, used in the sequences, and system results, given in Attachment C, is explained in the following tables:

Table E.5 Split Fraction Report - BASE CASE,

Table E.6 Split Fraction Report - NEW TS CASE.

TABLE E.1

MODEL Name: PCC BASE

Total Frequency of Sequences in Group : MELT = 5.94E-05 per year

06:42:55 24 FEB 1994

Rank	Initiating No. Event	Failed or Multi-State Split Fractions (Dependent "Guaranteed" Failures Excluded)	Frequency (per year)	Percent	Percent Cum	End State
1	L1CCB (2.5E-3)	( PAA <sup>1</sup> ) (2.6E-3)	6.55E-06	11.03	11.03	MELT
	LOSS OF TRAIN B PRIMARY COMPONENT COOLING - PCC TRAIN A - GIVEN TRAIN B FAILED (L1CCB)					
2	L1CCA (2.5E-3)	( PB2 <sup>1</sup> ) (2.6E-3)	6.55E-06	11.03	22.06	MELT
	LOSS OF TRAIN A PRIMARY COMPONENT COOLING - PCC TRAIN B - NO LOSP, TRANSIENT, OR SMALL LOCA - PA FAILED					
3	LOSP (7.0E-2)	( WA3 ) ( WBB ) ( ER9 ) (1.1E-2)(6.3E-2)(4.8E-2)	2.07E-06	3.48	25.54	MELT
	LOSS OF OFFSITE POWER - SERVICE WATER SYSTEM - TRAIN A - SERVICE WATER SYSTEM - TRAIN B - OP - RECOVERY OF OFFSITE POWER - EFW					
4	FCRCC (1.7E-5)	( ORS2 ) (1.0E-1 )	1.61E-06	2.71	28.25	MELT
	FIRE IN CONTROL ROOM - PCC LOSS - OP - OPERATOR ACTION - RESTART PCC, SW FOR MCB FIRE					
5	LOSP (7.0E-2)	( GA1 ) ( GBA ) ( ER1 ) (4.1E-2)(5.4E-2)(1.1E-2)	1.55E-06	2.61	30.86	MELT
	LOSS OF OFFSITE POWER - AC POWER - DIESEL GENERATOR A - AC POWER - DIESEL GENERATOR B - OP - RECOVERY OF BOTH D/GS AND OFFSITE POWER - EFW					
6	E7T (1.6E-5)	( QY7 ) ( QK7 ) (9.6E-1)(1.1E-1)	1.31E-06	2.21	33.07	MELT
	SEISMIC 0.7G TRANSIENT EVENT - HAZ - OFFSITE POWER AT SEISMIC LEVEL .7G - HAZ - 4.16KV SWITCHGEAR (RELAY CHATTERING) AT .7G					
7	ALOHF (1.3E+0)	( RT1 ) ( PL1 ) ( AM1 ) (1.4E-4)(6.7E-1)(1.0E-2)	1.02E-06	1.71	34.79	MELT
	ATWS - LOSS OF MAIN FEEDWATER (PLMFW + TLMFW) - SYS - REACTOR TRIP BOTH SSPS TRAINS AVAIL. - ET - PLANT POWER LEVEL > 40% - ATWS - ET - ATWS MITIGATION SYSTEM (GENERIC ESTIMATE)					

<sup>1</sup> - These numbers were hand calculated.

8	FLIP (6.9E-4)	( GA1 )( GBA )( ER5 ) (4.1E-2)(5.4E-2)(7.1E-1)	1.00E-06	1.68	36.47	MELT
FLOOD IN TURBINE BUILDING - LOSP - AC POWER - DIESEL GENERATOR A - AC POWER - DIESEL GENERATOR B - OP - RECOVERY OF BOTH D/GS - NO OFFSITE POWER - EFW						
9	SLOCA (1.8E-2)	( EH1 ) (6.0E-5)	9.93E-07	1.67	38.14	MELT
SMALL LOCA - SYS - EAH - GT OR T SIGNAL						
10	FLSW (1.1E-6)		9.30E-07	1.57	39.71	MELT
EXTERNAL FLOODING - LOSS OF ALL SERVICE WATER						
11	RT (1.4E+0)	( PA1 )( PB2 ) (1.0E-4)(7.0E-3)	9.14E-07	1.54	41.24	MELT
REACTOR TRIP - PCC TRAIN A - NO LOSP, TRANSIENT, OR SMALL LOCA - PCC TRAIN B - NO LOSP, TRANSIENT, OR SMALL LOCA - PA FAILED						
12	FPCC3P (2.0E-4)	( PB10 <sup>1</sup> ) (4.5E-3)	9.66E-07	1.53	41.25	MELT
FIRE IN PAB - LOSS OF TRAIN A PCC AND RUNNING TRAIN B PUMP - PCC TRAIN B - GIVEN FIRE RESULTING IN LOSS OF NORMALLY RUNNING PUMP						
13	L1SWB (3.3E-3)	( WA6 )( WB16 ) (6.4E-3)(4.0E-2)	7.88E-07	1.33	42.58	MELT
LOSS OF TRAIN B SERVICE WATER - SERVICE WATER SYSTEM - TRAIN A - SERVICE WATER SYSTEM - TRAIN B						
14	L1SWA (3.3E-3)	( WA6 )( WB2 ) (3.9E-2)(6.4E-3)	7.75E-07	1.30	43.88	MELT
LOSS OF TRAIN A SERVICE WATER - SERVICE WATER SYSTEM - TRAIN A - SERVICE WATER SYSTEM - TRAIN B						
15	PLMFV (1.1E+0)	( PA1 )( PB2 ) (1.0E-4)(7.0E-3)	7.65E-07	1.29	45.17	MELT
PARTIAL LOSS OF MAIN FEEDWATER - PCC TRAIN A - NO LOSP, TRANSIENT, OR SMALL LOCA - PCC TRAIN B - NO LOSP, TRANSIENT, OR SMALL LOCA - PA FAILED						

<sup>1</sup> - These numbers were hand calculated.

16	TT	( PA1 )( PB2 )	7.25E-07	1.22	46.39	MELT
		(1.1E+0) (1.0E-4)(7.0E-3)				

TURBINE TRIP  
 - PCC TRAIN A - NO LOSP, TRANSIENT, OR SMALL LOCA  
 - PCC TRAIN B - NO LOSP, TRANSIENT, OR SMALL LOCA - PA FAILED

17	SLOCA	( L52 )( L65 )( RMLT1 )	7.10E-07	1.20	47.59	MELT
		(1.8E-2) (5.2E-3)(8.4E-2)( 1.0E-1 )				

SMALL LOCA  
 - RHR INJECTION (WITH HX) - TRAIN A  
 - RHR INJECTION (WITH HX) - TRAIN B  
 - OP - OPERATOR PROVIDES MAKEUP TO RWST FOR LATE RHR FAILURES

18	ALOMF	( RT1 )( PL1 )( RT1 )( PSB3 )	6.69E-07	1.13	48.71	MELT
		(1.3E+0) (1.4E-4)(6.7E-1)(2.0E-2)(3.2E-1 )				

ATWS - LOSS OF MAIN FEEDWATER (PLMPW + TLMFW)  
 - SYS - REACTOR TRIP BOTH SSPS TRAINS AVAIL.  
 - ET - PLANT POWER LEVEL > 40% - ATWS  
 - ET - ROD INSERTION - AUTO OR MANUAL  
 - RCS PRESSURE RELIEF

19	E7T	( QY7 )( QD7 )	6.02E-07	1.01	49.72	MELT
		(1.6E-5) (9.6E-1)(5.2E-2)				

SEISMIC 0.7G TRANSIENT EVENT  
 - HAZ - OFFSITE POWER AT SEISMIC LEVEL .7G  
 - HAZ - DIESEL GENERATOR AT .7G

20	F0WPH	( WA5 )( WB16 )	5.93E-07	1.00	50.72	MELT
		(4.0E-4) (3.9E-2)(4.0E-2 )				

FIRE IN SW PUMPHOUSE - LOSS OF BOTH OCEAN SW TRAINS  
 - SERVICE WATER SYSTEM - TRAIN A  
 - SERVICE WATER SYSTEM - TRAIN B

21	ALOMF	( RT1 )( PL1 )( EFA )	5.71E-07	.96	51.68	MELT
		(1.3E+0) (1.4E-4)(6.7E-1)(5.5E-3)				

ATWS - LOSS OF MAIN FEEDWATER (PLMPW + TLMFW)  
 - SYS - REACTOR TRIP BOTH SSPS TRAINS AVAIL.  
 - ET - PLANT POWER LEVEL > 40% - ATWS  
 - EMERGENCY FEEDWATER - TURBINE DRIVEN AND MOTOR DRIVEN PUMPS

22	FLLP	( WA3 )( WB8 )	4.22E-07	.71	52.39	MELT
		(6.9E-4) (1.1E-2)(6.5E-2)				

FLOOD IN TURBINE BUILDING - LOSP  
 - SERVICE WATER SYSTEM - TRAIN A  
 - SERVICE WATER SYSTEM - TRAIN B

23	RT (1.4E+0)	( WA1 )( WB2 ) (5.2E-5)(6.4E-3)	4.20E-07	.71	53.10	MELT
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## REACTOR TRIP

- SERVICE WATER SYSTEM - TRAIN A
- SERVICE WATER SYSTEM - TRAIN B

24	EST (1.9E-5)	( QY5 )( QK5 ) (8.3E-1)(2.8E-2)	4.00E-07	.67	53.77	MELT
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## SEISMIC 0.5G TRANSIENT EVENT

- HAZ - OFFSITE POWER AT SEISMIC LEVEL .5G
- HAZ - 4.16KV SWITCHGEAR (RELAY CHATTERING) AT .5G

25	LOOP (7.0E-2)	( GA1 )( WB7 )( ER3 ) (4.1E-2)(1.3E-2)(1.2E-2)	3.86E-07	.65	54.42	MELT
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## LOSS OF OFFSITE POWER

- AC POWER - DIESEL GENERATOR A
- SERVICE WATER SYSTEM - TRAIN B
- DP - RECOVERY OF ONE D/G AND OFFSITE POWER - EFW



TABLE E.2

MODEL Name: PCC\_CHNG

Total Frequency of Sequences in Group : MELT = 6.74E-05 per year

06:44:56 24 FEB 1994

Rank	Initiating No.	Event	Failed or Multi-State Split Fractions (Dependent "Guaranteed" Failures Excluded)	Frequency (per year)	Percent	Percent Cum	End State
1	L1CCB (3.7E-3)	( PAA <sup>1</sup> ) (2.7E-3)		1.00E-05	14.84	14.84	MELT
	LOSS OF TRAIN B PRIMARY COMPONENT COOLING - PCC TRAIN A - GIVEN TRAIN B FAILED (L1CCB)						
2	L1CCA (3.7E-3)	( PB2 <sup>1</sup> ) (2.7E-3)		1.00E-05	14.84	29.67	MELT
	LOSS OF TRAIN A PRIMARY COMPONENT COOLING - PCC TRAIN B - NO LOSP, TRANSIENT, OR SMALL LOCA - PA FAILED						
3	LOSP (7.0E-2)	( WA3 ) ( WB8 ) ( ER9 ) (1.1E-2)(6.5E-2)(4.8E-2)		2.07E-06	3.07	32.74	MELT
	LOSS OF OFFSITE POWER - SERVICE WATER SYSTEM - TRAIN A - SERVICE WATER SYSTEM - TRAIN B - DP - RECOVERY OF OFFSITE POWER						
4	FPCC3P (2.0E-4)	( PB10 <sup>1</sup> ) (8.4E-3)		1.68E-06	2.49	35.24	MELT
	FIRE IN PAB - LOSS OF TRAIN A PCC AND RUNNING TRAIN B PUMP - PCC TRAIN B - GIVEN FIRE RESULTING IN LOSS OF NORMALLY RUNNING PUMP						
5	FCRCC (1.7E-5)	( ORS2 ) (1.0E-1 )		1.61E-06	2.38	37.63	MELT
	FIRE IN CONTROL ROOM - PCC LOSS - OP - OPERATOR ACTION - RESTART PCC, SW FOR MCB FIRE						
6	LOSP (7.0E-2)	( GA1 ) ( GB8 ) ( ER1 ) (4.1E-2)(5.4E-2)(1.1E-2)		1.55E-06	2.30	39.93	MELT
	LOSS OF OFFSITE POWER - AC POWER - DIESEL GENERATOR A - AC POWER - DIESEL GENERATOR B - OP - RECOVERY OF BOTH D/GS AND OFFSITE POWER - EFW						
7	E7T (1.6E-5)	( QY7 ) ( QK7 ) (9.6E-1)(1.1E-1)		1.31E-06	1.94	41.87	MELT
	SEISMIC 0.7G TRANSIENT EVENT - HAZ - OFFSITE POWER AT SEISMIC LEVEL .7G - HAZ - 4.16KV SWITCHGEAR (RELAY CHATTERING) AT .7G						

<sup>1</sup> - These numbers were hand calculated.

8	ALOHF (1.3E+0)	{ RT1 } { PL1 } { AM1 } (1.4E-4)(6.7E-1)(1.0E-2)	1.02E-06	1.51	43.38	MELT
ATWS - LOSS OF MAIN FEEDWATER (PLMFW + TLMFW) - SYS - REACTOR TRIP BOTH BSPS TRAINS AVAIL. - ET - PLANT POWER LEVEL > 40% - ATWS - ET - ATWS MITIGATION SYSTEM (GENERIC ESTIMATE)						
9	FLIP (6.9E-4)	{ GA1 } { GA2 } { ER5 } (4.1E-2)(5.4E-2)(7.1E-1)	1.00E-06	1.48	44.87	MELT
FLOOD IN TURBINE BUILDING - LOSP - AC POWER - DIESEL GENERATOR A - AC POWER - DIESEL GENERATOR B - DP - RECOVERY OF BOTH D/GS - NO OFFSITE POWER - EFW						
10	SLOCA (1.8E-2)	{ EH1 } (6.0E-5)	9.93E-07	1.47	46.34	MELT
SMALL LOCA - SYS - EAH - GT OR T SIGNAL						
11	RT (1.4E+0)	{ PA1 } { PB2 } (1.1E-4)(6.7E-3)	9.62E-07	1.43	47.77	MELT
REACTOR TRIP - PCC TRAIN A - NO LOSP, TRANSIENT, OR SMALL LOCA - PCC TRAIN B - NO LOSP, TRANSIENT, OR SMALL LOCA - PA FAILED						
12	FLSW (1.1E-6)		9.30E-07	1.38	49.15	MELT
EXTERNAL FLOODING - LOSS OF ALL SERVICE WATER						
13	PLMFW (1.1E+0)	{ PA1 } { PB2 } (1.1E-4)(6.7E-3)	8.05E-07	1.19	50.34	MELT
PARTIAL LOSS OF MAIN FEEDWATER - PCC TRAIN A - NO LOSP, TRANSIENT, OR SMALL LOCA - PCC TRAIN B - NO LOSP, TRANSIENT, OR SMALL LOCA - PA FAILED						
14	L1SWB (3.3E-3)	{ WAA } { WB16 } (6.4E-3)(4.0E-2)	7.88E-07	1.17	51.51	MELT
LOSS OF TRAIN B SERVICE WATER - SERVICE WATER SYSTEM - TRAIN A - SERVICE WATER SYSTEM - TRAIN B						
15	L1SWA (3.3E-3)	{ WA6 } { WB2 } (3.9E-2)(6.4E-3)	7.75E-07	1.15	52.66	MELT
LOSS OF TRAIN A SERVICE WATER - SERVICE WATER SYSTEM - TRAIN A - SERVICE WATER SYSTEM - TRAIN B						

16	TT (1.1E+0)	( PA1 )( PB2 ) (1.1E-4)(6.7E-3)	7.63E-07	1.13	53.79	MELT
TURBINE TRIP - PCC TRAIN A - NO LOSP, TRANSIENT, OR SMALL LOCA - PCC TRAIN B - NO LOSP, TRANSIENT, OR SMALL LOCA - PA FAILED						
17	BLOCA (1.8E-2)	( L52 )( L65 )( RMLT1 ) (5.2E-3)(8.4E-2)( 1.0E-1 )	7.10E-07	1.05	54.85	MELT
SMALL LOCA - RHR INJECTION (WITH HX) - TRAIN A - RHR INJECTION (WITH HX) - TRAIN B - GP - OPERATOR PROVIDED MAKEUP TO RWST FOR LATE RHR FAILURES						
18	ALOMF (1.3E+0)	( RT1 )( PL1 )( R11 )( PSB3 ) (1.4E-4)(6.7E-1)(2.0E-2)(3.2E-1 )	6.69E-07	.99	55.84	MELT
ATWS - LOSS OF MAIN FEEDWATER (PLMPW + TLMFW) - SYS - REACTOR TRIP BOTH SSPTS TRAINS AVAIL. - ET - PLANT POWER LEVEL > 40% - ATWS - ET - ROD INSERTION - AUTO OR MANUAL - RCS PRESSURE RELIEF						
19	E7T (1.6E-5)	( QY7 )( QD7 ) (9.6E-1)(5.2E-2)	6.02E-07	.89	56.73	MELT
SEISMIC 0.7G TRANSIENT EVENT - HAZ - OFFSITE POWER AT SEISMIC LEVEL .7G - HAZ - DIESEL GENERATOR AT .7G						
20	FSMPH (4.0E-4)	( WA6 )( WB16 ) (3.9E-2)(4.0E-2 )	5.93E-07	.88	57.61	MELT
FIRE IN SW PUMPHOUSE - LOSS OF BOTH OCEAN SW TRAINS - SERVICE WATER SYSTEM - TRAIN A - SERVICE WATER SYSTEM - TRAIN B						
21	ALOMF (1.3E+0)	( RT1 )( PL1 )( EFA ) (1.4E-4)(6.7E-1)(5.5E-3)	5.71E-07	.85	58.46	MELT
ATWS - LOSS OF MAIN FEEDWATER (PLMPW + TLMFW) - SYS - REACTOR TRIP BOTH SSPTS TRAINS AVAIL. - ET - PLANT POWER LEVEL > 40% - ATWS - EMERGENCY FEEDWATER - TURBINE DRIVEN AND MOTOR DRIVEN PUMPS						
22	FLLP (6.9E-4)	( WA3 )( WB8 ) (1.1E-2)(6.5E-2)	4.22E-07	.63	59.08	MELT
FLOOD IN TURBINE BUILDING - LOSP - SERVICE WATER SYSTEM - TRAIN A - SERVICE WATER SYSTEM - TRAIN B						

23 RT (1.4E+0) ( W1 )( W2 ) 4.20E-07 .62 59.71 MELT

REACTOR TRIP  
- SERVICE WATER SYSTEM - TRAIN A  
- SERVICE WATER SYSTEM - TRAIN B

24 EST (1.9E-5) ( W5 )( W5 ) 4.00E-07 .59 60.30 MELT

DESIGNIC 0.5G TRANSIENT EVENT  
- HAZ - OFF-SITE POWER AT SEISMIC LEVEL .5G  
- HAZ - 4.16KV SWITCHGEAR (RELAY CHATTERING) AT .5G

25 LOSSP (7.0E-2) ( G1 )( W7 )( ER3 ) 3.88E-07 .58 60.88 MELT

LOSS OF OFFSITE POWER  
- AC POWER - DIESEL GENERATOR A  
- SERVICE WATER SYSTEM - TRAIN B  
- OP - RECOVERY OF ONE D/G AND OFFSITE POWER - EFN

TABLE E.3

MODEL Name: PCC, SBES

Total Frequency of Sequences in Group: MELT = 2.90E-03 per year

14:11:07 18 FEB 1994

Seq#	Initiating Event	Frequency (per year)	Percent	Cumulative Percent	End State
1	L10CB (PMA) (2.1E-2) LOSS OF TRAIN B PRIMARY COMPONENT COOLING - TRAIN A - PRIMARY COMPONENT COOLING - TRAIN A	1.23E-05	42.52	42.52	MELT
2	L10CA (P62) (2.1E-2) LOSS OF TRAIN A PRIMARY COMPONENT COOLING - PRIMARY COMPONENT COOLING - TRAIN B	1.23E-05	42.52	85.04	MELT
3	PPO3P (2.8E-4) PIPE IN PAB - LOSS OF TRAIN A PCC AND BLISSING TRAIN B PUMP	1.87E-04	6.46	91.49	MELT
4	L10CB (PMA) (0.2) (2.1E-2) (2.3E-2) LOSS OF TRAIN B PRIMARY COMPONENT COOLING - PRIMARY COMPONENT COOLING - TRAIN A - OP - OPERATOR ACTION - DEPRESSURIZE - GIVES SEAL LOCA (NON-SBO)	2.90E-05	1.88	92.50	MELT
5	L10CA (P62) (0.2) (2.1E-2) (2.3E-2) LOSS OF TRAIN A PRIMARY COMPONENT COOLING - PRIMARY COMPONENT COOLING - TRAIN B - OP - OPERATOR ACTION - DEPRESSURIZE - GIVES SEAL LOCA (NON-SBO)	2.90E-05	1.88	93.50	MELT
6	L10CB (PMA) (0.3) (2.1E-2) (9.4E-3) LOSS OF TRAIN B PRIMARY COMPONENT COOLING - PRIMARY COMPONENT COOLING - TRAIN A - CONTAINMENT BUILDING SPRAY - INJECTION MODE FOR 1 HOUR - TRAIN B	1.16E-05	.40	93.90	MELT
7	L10CA (P62) (0.3) (2.1E-2) (9.4E-3) LOSS OF TRAIN A PRIMARY COMPONENT COOLING - PRIMARY COMPONENT COOLING - TRAIN B - CONTAINMENT BUILDING SPRAY - INJECTION MODE FOR 1 HOUR - TRAIN B	1.16E-05	.40	94.30	MELT
8	L10CB (PMA) (0.1) (2.1E-2) (9.6E-3) LOSS OF TRAIN B PRIMARY COMPONENT COOLING - PRIMARY COMPONENT COOLING - TRAIN A - CONTAINMENT BUILDING SPRAY - INJECTION FOR 1 HOUR - TRAIN A	1.13E-05	.39	94.69	MELT

Failed or Multi-Stage Split Fractions (Dependent "Quantities" Failures Excluded)

9	L1CCA (6.3E-2)	( PB2 )( CA1 ) (2.1E-2)(9.6E-3)	1.13E-05	.39	95.08	MELT
LOSS OF TRAIN A PRIMARY COMPONENT COOLING - PRIMARY COMPONENT COOLING - TRAIN B - CONTAINMENT BUILDING SPRAY - INJECTION FOR 1 HOUR - TRAIN A						
10	BT (1.4E+0)	( PA1 )( PB2 ) (2.9E-4)(2.1E-2)	7.80E-06	.27	95.34	MELT
REACTOR TRIP - PRIMARY COMPONENT COOLING - TRAIN A - PRIMARY COMPONENT COOLING - TRAIN B						
11	PLRPV (1.1E+0)	( PA1 )( PB2 ) (2.9E-4)(2.1E-2)	6.53E-06	.22	95.57	MELT
PARTIAL LOSS OF MAIN FEEDWATER - PRIMARY COMPONENT COOLING - TRAIN A - PRIMARY COMPONENT COOLING - TRAIN B						
12	TT (1.1E+0)	( PA1 )( PB2 ) (2.9E-4)(2.1E-2)	6.18E-06	.21	95.78	MELT
TURBINE TRIP - PRIMARY COMPONENT COOLING - TRAIN A - PRIMARY COMPONENT COOLING - TRAIN B						
13	L1CCB (6.3E-2)	( PAA )( ZA2 ) (2.1E-2)(5.8E-3)	5.86E-06	.20	95.98	MELT
LOSS OF TRAIN B PRIMARY COMPONENT COOLING - PRIMARY COMPONENT COOLING - TRAIN A - CONTAINMENT SUMP VALVE (AND RHR HOT LEG SUCTION VALVES) - TRAIN A						
14	L1CCA (6.3E-2)	( PB2 )( ZA2 ) (2.1E-2)(5.8E-3)	5.86E-06	.20	96.19	MELT
LOSS OF TRAIN A PRIMARY COMPONENT COOLING - PRIMARY COMPONENT COOLING - TRAIN B - CONTAINMENT SUMP VALVE (AND RHR HOT LEG SUCTION VALVES) - TRAIN A						
15	L1CCB (6.3E-2)	( PAA )( CIA ) (2.1E-2)(4.5E-3)	5.57E-06	.19	96.38	MELT
LOSS OF TRAIN B PRIMARY COMPONENT COOLING - PRIMARY COMPONENT COOLING - TRAIN A - SYS - CIS (SMALL) - ALL SUPPORT AVAILABLE						
16	L1CCA (6.3E-2)	( PB2 )( CIA ) (2.1E-2)(4.5E-3)	5.57E-06	.19	96.57	MELT
LOSS OF TRAIN A PRIMARY COMPONENT COOLING - PRIMARY COMPONENT COOLING - TRAIN B - SYS - CIS (SMALL) - ALL SUPPORT AVAILABLE						

17	L1CCB (6.3E-2)	( PAA )( ZB6 ) (2.1E-2)(4.3E-3)	5.30E-06	.18	96.75	MELT
LOSS OF TRAIN B PRIMARY COMPONENT COOLING - PRIMARY COMPONENT COOLING - TRAIN A - CONTAINMENT SUMP VALVE (AND RHR HOT LEG SUCTION VALVES) - TRAIN B						
18	L1CCA (6.3E-2)	( PB2 )( ZB6 ) (2.1E-2)(4.3E-3)	5.30E-06	.18	96.93	MELT
LOSS OF TRAIN A PRIMARY COMPONENT COOLING - PRIMARY COMPONENT COOLING - TRAIN B - CONTAINMENT SUMP VALVE (AND RHR HOT LEG SUCTION VALVES) - TRAIN B						
19	FPCC3P (2.0E-4)	( OR2 ) (2.3E-2)	4.41E-06	.15	97.09	MELT
FIRE IN PAB - LOSS OF TRAIN A PCC AND RUNNING TRAIN B PUMP - OP - OPERATOR ACTION - DEPRESSURIZE - GIVEN SEAL LOCA (NOR-SBO)						
20	L1CCR (6.3E-2)	( MB3 ) (5.4E-5)	3.19E-06	.11	97.20	MELT
LOSS OF TRAIN A PRIMARY COMPONENT COOLING - SERVICE WATER SYSTEM - TRAIN B						
21	L1CCB (6.3E-2)	( M61 ) (5.2E-5)	3.05E-06	.11	97.30	MELT
LOSS OF TRAIN B PRIMARY COMPONENT COOLING - SERVICE WATER SYSTEM - TRAIN A						

[REDACTED]

[REDACTED]

23	FPCC3P (2.0E-4)	( OR5 ) (9.4E-3)	1.77E-06	.06	97.43	MELT
FIRE IN PAB - LOSS OF TRAIN A PCC AND RUNNING TRAIN B PUMP - CONTAINMENT BUILDING SPRAY - INJECTION MODE FOR 1 HOUR - TRAIN B						
24	FPCC3P (2.0E-4)	( CA1 ) (9.6E-3)	1.71E-06	.06	97.49	MELT
FIRE IN PAB - LOSS OF TRAIN A PCC AND RUNNING TRAIN B PUMP - CONTAINMENT BUILDING SPRAY - INJECTION FOR 1 HOUR - TRAIN A						
25	FCRCC (1.7E-5)	( ORS2 ) (1.0E-1)	1.61E-06	.06	97.55	MELT
FIRE IN CONTROL ROOM - PCC LOSS - OP - OPERATOR ACTION - RESTART PCC, SW FOR MCB FIRE W/RCPs NOT TRIPPED - FCRCC, FCRSM						

## TABLE E.4

1/3

MODEL Name: CC\_SW\_TS

Total Frequency of Sequences in Group : MELT = 7.15E-05 per year

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Rank No.	Initiating Event	Failed or Multi-State Split Fractions (Dependent "Guaranteed" Failures Excluded)	Frequency (per year)	Percent	Percent Cumulative	End State
1	L1CCB (3.7E-3)	( PAA <sup>1</sup> ) (2.7E-3)	1.00E-05	13.99	13.99	MELT
	LOSS OF TRAIN B PRIMARY COMPONENT COOLING - PCC TRAIN A - GIVEN TRAIN B FAILED (L1CCB)					
2	L1CCA (3.7E-3)	( PB2 <sup>1</sup> ) (2.7E-3)	1.00E-05	13.99	27.97	MELT
	LOSS OF TRAIN A PRIMARY COMPONENT COOLING - PCC TRAIN B - NO LOSP, TRANSIENT, OR SMALL LOCA - PA FAILED					
3	LOSP (7.0E-2)	( WA3 ) ( WBB ) ( ER9 ) (1.2E-2)(6.4E-2)(4.8E-2)	2.18E-06	3.05	31.02	MELT
	LOSS OF OFFSITE POWER - SERVICE WATER SYSTEM - TRAIN A - SERVICE WATER SYSTEM - TRAIN B - OP - RECOVERY OF OFFSITE POWER					
4	FPCC3P (2.0E-4)	( PB10 <sup>1</sup> ) ( <del>8.4E-3</del> ) 8.4E-3	1.68E-06	2.35	33.37	MELT
	FIRE IN PAB - LOSS OF TRAIN A PCC AND RUNNING TRAIN B PUMP - PCC TRAIN B - GIVEN FIRE RESULTING IN LOSS OF NORMALLY RUNNING PUMP					
5	FCRCC (1.7E-5)	( ORS2 ) (1.0E-1 )	1.61E-06	2.25	35.62	MELT
	FIRE IN CONTROL ROOM - PCC LOSS - OP - OPERATOR ACTION - RESTART PCC, SW FOR MCB FIRE					
6	L1SWB (5.3E-3)	( WAA ) ( WB16 ) (7.1E-3)(4.5E-2 )	1.57E-06	2.20	37.82	MELT
	LOSS OF TRAIN B SERVICE WATER - SERVICE WATER SYSTEM - TRAIN A - SERVICE WATER SYSTEM - TRAIN B					
7	LOSP (7.0E-2)	( GA1 ) ( GBA ) ( ER1 ) (4.1E-2)(5.4E-2)(1.1E-2)	1.55E-06	2.17	39.99	MELT
	LOSS OF OFFSITE POWER - AC POWER - DIESEL GENERATOR A - AC POWER - DIESEL GENERATOR B - OP - RECOVERY OF BOTH D/GS AND OFFSITE POWER - EFW					
8	L1SWA (5.3E-3)	( WA6 ) ( WB2 ) (4.1E-2)(7.1E-3)	1.43E-06	2.00	41.99	MELT
	LOSS OF TRAIN A SERVICE WATER - Cut Sets Imported from Worrell SETS - Cut Sets Imported from Worrell SETS					

<sup>1</sup> - These numbers were hand calculated.



9	E7T (1.6E-5)	( QY7 )( QK7 ) (9.6E-1)(1.1E-1)	1.31E-06	1.83	43.82	MELT
SEISMIC 0.7G TRANSIENT EVENT - HAZ - OFFSITE POWER AT SEISMIC LEVEL .7G - HAZ - 4.16KV SWITCHGEAR (RELAY CHATTERING) AT .7G						
10	ALOMP (1.3E+0)	( RT1 )( PL1 )( AM1 ) (1.4E-4)(6.7E-1)(1.0E-2)	1.02E-06	1.43	45.24	MELT
ATWS - LOSS OF MAIN FEEDWATER (PLMFW + FLMFW) - SYS - REACTOR TRIP BOTH SSPS TRAINS AVAIL. - ET - PLANT POWER LEVEL > 40% - ATWS - ET - ATWS MITIGATION SYSTEM (GENERIC ESTIMATE)						
11	FLLP (6.9E-4)	( GA1 )( GRA )( ERS ) (4.1E-2)(5.4E-2)(7.1E-1)	1.00E-06	1.40	46.64	MELT
FLOOD IN TURBINE BUILDING - LOSP - AC POWER - DIESEL GENERATOR A - AC POWER - DIESEL GENERATOR B - OP - RECOVERY OF BOTH D/GS - NO OFFSITE POWER - BFW						
12	SLOCA (1.8E-2)	( EH1 ) (6.0E-5)	9.93E-07	1.39	48.03	MELT
SMALL LOCA - SYS - EAH - GT OR T SIGNAL						
13	RT (1.4E+0)	( PA1 )( PB2 ) (1.1E-4)(6.7E-3)	9.62E-07	1.35	49.38	MELT
REACTOR TRIP - PCC TRAIN A - NO LOSP, TRANSIENT, OR SMALL LOCA - PCC TRAIN B - NO LOSP, TRANSIENT, OR SMALL LOCA - PA FAILED						
14	FLSW (1.1E-6)		9.30E-07	1.30	50.68	MELT
EXTERNAL FLOODING - LOSS OF ALL SERVICE WATER						
15	PLMFW (1.1E+0)	( PA1 )( PB2 ) (1.1E-4)(6.7E-3)	8.05E-07	1.12	51.80	MELT
PARTIAL LOSS OF MAIN FEEDWATER - PCC TRAIN A - NO LOSP, TRANSIENT, OR SMALL LOCA - PCC TRAIN B - NO LOSP, TRANSIENT, OR SMALL LOCA - PA FAILED						
16	TT (1.1E+0)	( PA1 )( PB2 ) (1.1E-4)(6.7E-3)	7.63E-07	1.07	52.87	MELT
TURBINE TRIP - PCC TRAIN A - NO LOSP, TRANSIENT, OR SMALL LOCA - PCC TRAIN B - NO LOSP, TRANSIENT, OR SMALL LOCA - PA FAILED						
17	SLOCA (1.8E-2)	( L52 )( L65 )( PMLT1 ) (5.2E-3)(8.4E-2)(1.0E-1)	7.10E-07	.99	53.86	MELT
SMALL LOCA - RHR INJECTION (WITH HX) - TRAIN A - RHR INJECTION (WITH HX) - TRAIN B - OP - OPERATOR PROVIDES MAKEUP TO RWST FOR LATE RHR FAILURES						

18	FSWPH (4.0E-4)	( WA6 )( WB16 ) (4.1E-2)(4.5E-2 )	6.96E-07	.97	54.84	MELT
FIRE IN SW PUMPHOUSE - LOSS OF BOTH OCEAN SW TRAINS - SERVICE WATER SYSTEM - TRAIN A - SERVICE WATER SYSTEM - TRAIN B						
19	ALOMF (1.3E+0)	( RT1 )( PL1 )( R11 )( PSB3 ) (1.4E-4)(6.7E-1)(2.0E-2)(3.2E-1 )	6.69E-07	.94	55.77	MELT
ATWS - LOSS OF MAIN FEEDWATER (PLMFW + TLMFW) - SYS - REACTOR TRIP BOTH SSPTS TRAINS AVAIL. - ET - PLANT POWER LEVEL > 40% - ATWS - ET - ROD INSERTION - AUTO OR MANUAL - RCS PRESSURE RELIEF						
20	E7T (1.6E-5)	( QY7 )( QD7 ) (9.6E-1)(3.2E-2)	6.02E-07	.84	56.62	MELT
SEISMIC 0.7G TRANSIENT EVENT - HAZ - OFFSITE POWER AT SEISMIC LEVEL .7G - HAZ - DIESEL GENERATOR AT .7G						
21	ALOMF (1.3E+0)	( RT1 )( PL1 )( EFA ) (1.4E-4)(6.7E-1)(5.5E-3)	5.71E-07	.80	57.41	MELT
ATWS - LOSS OF MAIN FEEDWATER (PLMFW + TLMFW) - SYS - REACTOR TRIP BOTH SSPTS TRAINS AVAIL. - ET - PLANT POWER LEVEL > 40% - ATWS - EMERGENCY FEEDWATER - TURBINE DRIVEN AND MOTOR DRIVEN PUMPS						
22	RT (1.4E+0)	( WA1 )( WB2 ) (5.6E-5)(7.1E-3)	5.04E-07	.70	58.12	MELT
REACTOR TRIP - SERVICE WATER SYSTEM - TRAIN A - SERVICE WATER SYSTEM - TRAIN B						
23	FLLP (6.9E-4)	( WA3 )( WB8 ) (1.2E-2)(6.4E-2)	4.46E-07	.62	58.74	MELT
FLOOD IN TURBINE BUILDING - LOSP - SERVICE WATER SYSTEM - TRAIN A - SERVICE WATER SYSTEM - TRAIN B						
24	PLMFW (1.1E+0)	( WA1 )( WB2 ) (5.6E-5)(7.1E-3)	4.22E-07	.59	59.33	MELT
PARTIAL LOSS OF MAIN FEEDWATER - SERVICE WATER SYSTEM - TRAIN A - SERVICE WATER SYSTEM - TRAIN B						
25	EST (1.9E-5)	( QY5 )( QK5 ) (8.3E-1)(2.8E-2)	4.00E-07	.56	59.89	MELT
SEISMIC 0.5G TRANSIENT EVENT - HAZ - OFFSITE POWER AT SEISMIC LEVEL .5G - HAZ - 4.16KV SWITCHGEAR (RELAY CHATTERING) AT .5G						

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## Split Fraction PA1 - PCC TRAIN A - NO LOSP, TRANSIENT OR SMALL LOCA

PE Mean = 1.0352E-04 Date : 08 FEB 1994 14:14

## Basic Event Impacts for Split Fraction : PA1

Basic Event	State	Description
XX.TRAINA.XX	S	TRAIN A SUPPORT SYSTEMS UNAVAILABLE
XX.TRAINB.XX	F	TRAIN B SUPPORT AVAILABLE
XX.OSP.XX	S	OFFSITE POWER AVAILABLE
XX.LLOCA.XX	S	NO MEDIUM OR LARGE LOCA PRESENT
XX.SLOCA.XX	F	NO SMALL LOCA, SGTR, OR SLBI PRESENT
XX.TRANSIENT.XX	F	LONG TERM RHR COOLDOWN (TRANSIENT INITIATORS)

## Split Fraction PA2 - PCC TRAIN A - LOSP

PE Mean = 3.1090E-04 Date : 08 FEB 1994 14:14

## Basic Event Impacts for Split Fraction : PA2

Basic Event	State	Description
XX.TRAINA.XX	S	TRAIN A SUPPORT SYSTEMS UNAVAILABLE
XX.TRAINB.XX	F	TRAIN B SUPPORT AVAILABLE
XX.OSP.XX	F	OFFSITE POWER AVAILABLE
XX.LLOCA.XX	S	NO MEDIUM OR LARGE LOCA PRESENT
XX.SLOCA.XX	F	NO SMALL LOCA, SGTR, OR SLBI PRESENT
XX.TRANSIENT.XX	F	LONG TERM RHR COOLDOWN (TRANSIENT INITIATORS)

## Split Fraction PA3 - PCC TRAIN A - MEDIUM OR LARGE LOCA

PE Mean = 3.9137E-04 Date : 08 FEB 1994 14:14

## Basic Event Impacts for Split Fraction : PA3

Basic Event	State	Description
XX.TRAINA.XX	S	TRAIN A SUPPORT SYSTEMS UNAVAILABLE
XX.TRAINB.XX	F	TRAIN B SUPPORT AVAILABLE
XX.OSP.XX	S	OFFSITE POWER AVAILABLE
XX.LLOCA.XX	F	NO MEDIUM OR LARGE LOCA PRESENT
XX.SLOCA.XX	S	NO SMALL LOCA, SGTR, OR SLBI PRESENT
XX.TRANSIENT.XX	S	LONG TERM RHR COOLDOWN (TRANSIENT INITIATORS)

## Split Fraction PAA - PCC TRAIN A - GIVEN TRAIN B FAILED

PE Mean = 6.9650E-03 Date : 08 FEB 1994 14:14

Equation: PCC1/PA1

## Split Fraction PAF - PCC TRAIN A - GUARANTEED FAILURE

PE Mean = 1.0000E+00 Date : 08 FEB 1994 14:14  
MC/LH Mean = 1.0000E+00 Date : 23 JUN 1993 22:21

Constant Value: 1.0

MODEL Name: PCC\_BASE  
Split Fraction Report for Top Event PB

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Split Fraction PB1 - PCC TRAIN B, NO LOSP, TRANSIENT OR SMALL LOCA, SINGLE TRAIN

PE Mean = 1.0352E-04 Date : 08 FEB 1994 14:14

Basic Event Impacts for Split Fraction : PB1

Basic Event	State	Description
XX.TRAINA.XX	F	TRAIN A SUPPORT SYSTEMS UNAVAILABLE
XX.TRAINB.XX	S	TRAIN B SUPPORT AVAILABLE
XX.OSP.XX	S	OFFSITE POWER AVAILABLE
XX.LLOCA.XX	S	NO MEDIUM OR LARGE LOCA PRESENT
XX.SLOCA.XX	F	NO SMALL LOCA, SGTR, OR SLBI PRESENT
XX.TRANSIENT.XX	F	LONG TERM RHR COOLDOWN (TRANSIENT INITIATORS)

Split Fraction PB2 - PCC TRAIN B, NO LOSP, TRANSIENT OR SMALL LOCA, PA FAILED

PE Mean = 6.9650E-03 Date : 08 FEB 1994 14:14

Conditional Split Fraction: PCC1/PA1

Split Fraction PB3 - PCC TRAIN B, NO LOSP, TRANSIENT OR SMALL LOCA, GIVEN PA SUCCESS

PE Mean = 1.0280E-04 Date : 08 FEB 1994 14:14

Conditional Split Fraction: (PB1 - PCC1)/(1-PA1)

Split Fraction PB4 - PCC TRAIN B, LOSP, SINGLE TRAIN

PE Mean = 3.1090E-04 Date : 08 FEB 1994 14:14

Basic Event Impacts for Split Fraction : PB4

Basic Event	State	Description
XX.TRAINA.XX	F	TRAIN A SUPPORT SYSTEMS UNAVAILABLE
XX.TRAINB.XX	S	TRAIN B SUPPORT AVAILABLE
XX.OSP.XX	F	OFFSITE POWER AVAILABLE
XX.LLOCA.XX	S	NO MEDIUM OR LARGE LOCA PRESENT
XX.SLOCA.XX	F	NO SMALL LOCA, SGTR, OR SLBI PRESENT
XX.TRANSIENT.XX	F	LONG TERM RHR COOLDOWN (TRANSIENT INITIATORS)

Split Fraction PB5 - PCC TRAIN B, LOSP, PA FAILED

PE Mean = 8.9930E-03 Date : 08 FEB 1994 14:14

Conditional Split Fraction: PCC2/PA2

Split Fraction PB6 - PCC TRAIN B, LOSP, PA SUCCESSFUL

PE Mean = 3.0820E-04 Date : 08 FEB 1994 14:14

Conditional Split Fraction: (PB4-PCC2)/(1-PA2)

Split Fraction PB7 - PCC TRAIN B, MEDIUM OR LLOCA, SINGLE TRAIN

PE Mean = 3.9096E-04 Date : 08 FEB 1994 14:14

Basic Event Impacts for Split Fraction : PB7

Basic Event	State	Description
XX.TRAINA.XX	F	TRAIN A SUPPORT SYSTEMS UNAVAILABLE
XX.TRAINB.XX	S	TRAIN B SUPPORT AVAILABLE
XX.OSP.XX	S	OFFSITE POWER AVAILABLE
XX.LLOCA.XX	F	NO MEDIUM OR LARGE LOCA PRESENT
XX.SLOCA.XX	S	NO SMALL LOCA, SGTR, OR SLBI PRESENT
XX.TRANSIENT.XX	S	LONG TERM RHR COOLDOWN (TRANSIENT INITIATORS)

Split Fraction PB8 - PCC TRAIN B, MEDIUM OR LLOCA, PA FAILED

PE Mean = 5.6460E-02 Date : 08 FEB 1994 14:14

Conditional Split Fraction: PCC3/PA3

Split Fraction PB9 - PCC TRAIN B, MEDIUM OR LLOCA, PA SUCCESSFUL

PE Mean = 3.6910E-04 Date : 08 FEB 1994 14:14

Conditional Split Fraction: (PB7-PCC3)/(1-PA3)

Split Fraction PB6 - PCC TRAIN B, GUARANTEED FAILURE

PE Mean = 1.0000E+00 Date : 08 FEB 1994 14:14

Constant Value: 1.0

Split Fraction PB10 - PCC TRAIN B, GIVEN FIRE RESULTING IN LOSS OF NORMALLY RUNNING PUMP

PE Mean = 1.2631E-02 Date : 08 FEB 1994 14:14

Basic Event Impacts for Split Fraction : PB10

Basic Event	State	Description
XX.LLOCA.XX	S	NO MEDIUM OR LARGE LOCA PRESENT
XX.TRANSIENT.XX	F	LONG TERM RHR COOLDOWN (TRANSIENT INITIATORS)
XX.OSP.XX	S	OFFSITE POWER AVAILABLE
XX.TRAINB.XX	S	TRAIN B SUPPORT AVAILABLE
XX.TRAINA.XX	S	TRAIN A SUPPORT SYSTEMS UNAVAILABLE
XX.SLOCA.XX	F	NO SMALL LOCA, SGTR, OR SLBI PRESENT
VL.CCV301.CL	F	P-11B SUCTION GATE VALVE CC-V301 TRANSFERS CLOSED
VL.CCV296.CL	F	P-11B DISCHARGE GATE VALVE CC-V296 TRANSFERS CLOSED
CV.CCV295.CL	F	P-11B DISCHARGE CHECK VALVE CC.V295 TRANSFERS CLOSED

TABLE E.6

Split Fraction PA1 - PCC TRAIN A - NO LOSP, TRANSIENT OR SMALL LOCA

PE Mean = 1.1314E-04 Date : 10 FEB 1994 08:16

Basic Event Impacts for Split Fraction : PA1

Basic Event	State	Description
XX.TRAINA.XX	S	TRAIN A SUPPORT SYSTEMS UNAVAILABLE
XX.TRAINB.XX	F	TRAIN B SUPPORT AVAILABLE
XX.OSP.XX	S	OFFSITE POWER AVAILABLE
XX.LLOCA.XX	S	NO MEDIUM OR LARGE LOCA PRESENT
XX.SLOCA.XX	F	NO SMALL LOCA, SGTR, OR SLBI PRESENT
XX.TRANSIENT.XX	F	LONG TERM RHR COOLDOWN (TRANSIENT INITIATORS)

Split Fraction PA2 - PCC TRAIN A - LOSP

PE Mean = 3.7831E-04 Date : 10 FEB 1994 08:16

Basic Event Impacts for Split Fraction : PA2

Basic Event	State	Description
XX.TRAINA.XX	S	TRAIN A SUPPORT SYSTEMS UNAVAILABLE
XX.TRAINB.XX	F	TRAIN B SUPPORT AVAILABLE
XX.OSP.XX	F	OFFSITE POWER AVAILABLE
XX.LLOCA.XX	S	NO MEDIUM OR LARGE LOCA PRESENT
XX.SLOCA.XX	F	NO SMALL LOCA, SGTR, OR SLBI PRESENT
XX.TRANSIENT.XX	F	LONG TERM RHR COOLDOWN (TRANSIENT INITIATORS)

Split Fraction PA3 - PCC TRAIN A - MEDIUM OR LARGE LOCA

PE Mean = 4.0100E-04 Date : 10 FEB 1994 08:16

Basic Event Impacts for Split Fraction : PA3

Basic Event	State	Description
XX.TRAINA.XX	S	TRAIN A SUPPORT SYSTEMS UNAVAILABLE
XX.TRAINB.XX	F	TRAIN B SUPPORT AVAILABLE
XX.OSP.XX	S	OFFSITE POWER AVAILABLE
XX.LLOCA.XX	F	NO MEDIUM OR LARGE LOCA PRESENT
XX.SLOCA.XX	S	NO SMALL LOCA, SGTR, OR SLBI PRESENT
XX.TRANSIENT.XX	S	LONG TERM RHR COOLDOWN (TRANSIENT INITIATORS)

Split Fraction PAA - PCC TRAIN A - GIVEN TRAIN B FAILED

PE Mean = 6.7060E-03 Date : 10 FEB 1994 08:16

Equation: PCC1/PA1

Split Fraction PAF - PCC TRAIN A - GUARANTEED FAILURE

PE Mean = 1.0000E+00 Date : 10 FEB 1994 08:16

Constant Value: 1.0

Split Fraction PB1 - PCC TRAIN B, NO LOSP, TRANSIENT OR SMALL LOCA, SINGLE TRAIN

PE Mean = 1.1314E-04 Date : 10 FEB 1994 08:16

Basic Event Impacts for Split Fraction : PB1

Basic Event	state	Description
XX.TRAINA.XX	F	TRAIN A SUPPORT SYSTEMS UNAVAILABLE
XX.TRAINB.XX	S	TRAIN B SUPPORT AVAILABLE
XX.OSP.XX	S	OFFSITE POWER AVAILABLE
XX.LLOCA.XX	S	NO MEDIUM OR LARGE LOCA PRESENT
XX.SLOCA.XX	F	NO SMALL LOCA, SGTR, OR SLBI PRESENT
XX.TRANSIENT.XX	F	LONG TERM RHR COOLDOWN (TRANSIENT INITIATORS)

Split Fraction PB2 - PCC TRAIN B, NO LOSP, TRANSIENT OR SMALL LOCA, PA FAILED

PE Mean = 6.7060E-03 Date : 10 FEB 1994 08:16

Conditional Split Fraction: PCC1/PA1

Split Fraction PB3 - PCC TRAIN B, NO LOSP, TRANSIENT OR SMALL LOCA, GIVEN PA SUCCESS

PE Mean = 1.1240E-04 Date : 10 FEB 1994 08:16

Conditional Split Fraction: (PB1 - PCC1)/(1-PA1)

Split Fraction PB4 - PCC TRAIN B, LOSP, SINGLE TRAIN

PE Mean = 3.7831E-04 Date : 10 FEB 1994 08:16

Basic Event Impacts for Split Fraction : PB4

Basic Event	State	Description
XX.TRAINA.XX	F	TRAIN A SUPPORT SYSTEMS UNAVAILABLE
XX.TRAINB.XX	S	TRAIN B SUPPORT AVAILABLE
XX.OSP.XX	F	OFFSITE POWER AVAILABLE
XX.LLOCA.XX	S	NO MEDIUM OR LARGE LOCA PRESENT
XX.SLOCA.XX	F	NO SMALL LOCA, SGTR, OR SLBI PRESENT
XX.TRANSIENT.XX	F	LONG TERM RHR COOLDOWN (TRANSIENT INITIATORS)

Split Fraction PB5 - PCC TRAIN B, LOSP, PA FAILED

PE Mean = 7.5830E-03 Date : 10 FEB 1994 08:16

Conditional Split Fraction: PCC2/PA2

Split Fraction PB6 - PCC TRAIN B, LOSP, PA SUCCESSFUL

PE Mean = 3.7550E-04 Date : 10 FEB 1994 08:16

Conditional Split Fraction: (PB4-PCC2)/(1-PA2)

Split Fraction PB7 - PCC TRAIN B, MEDIUM OR LLOCA, SINGLE TRAIN

PE Mean = 4.0059E-04 Date : 10 FEB 1994 08:16

Basic Event Impacts for Split Fraction : PB7

Basic Event	State	Description
XX.TRAINA.XX	F	TRAIN A SUPPORT SYSTEMS UNAVAILABLE
XX.TRAINB.XX	S	TRAIN B SUPPORT AVAILABLE
XX.OSP.XX	S	OFFSITE POWER AVAILABLE
XX.LLOCA.XX	F	NO MEDIUM OR LARGE LOCA PRESENT
XX.SLOCA.XX	S	NO SMALL LOCA, SGTR, OR SLBI PRESENT
XX.TRANSIENT.XX	S	LONG TERM RHR COOLDOWN (TRANSIENT INITIATORS)

Split Fraction PB8 - PCC TRAIN B, MEDIUM OR LLOCA, PA FAILED

PE Mean = 5.5200E-02 Date : 10 FEB 1994 08:16

Conditional Split Fraction: PCC3/PA3

Split Fraction PB9 - PCC TRAIN B, MEDIUM OR LLOCA, PA SUCCESSFUL

PE Mean = 3.7860E-04 Date : 10 FEB 1994 08:16

Conditional Split Fraction: (PB7-PCC3)/(1-PA3)

Split Fraction PBF - PCC TRAIN B, GUARANTEED FAILURE

PE Mean = 1.0000E+00 Date : 10 FEB 1994 08:16

Constant Value: 1.0

Split Fraction PB10 - PCC TRAIN B, GIVEN FIRE RESULTING IN LOSS OF NORMALLY RUNNING PUMP

PE Mean = 5.3362E-02 Date : 10 FEB 1994 08:16

Basic Event Impacts for Split Fraction : PB10

Basic Event	State	Description
XX.LLOCA.XX	S	NO MEDIUM OR LARGE LOCA PRESENT
XX.TRANSIENT.XX	F	LONG TERM RHR COOLDOWN (TRANSIENT INITIATORS)
XX.OSP.XX	S	OFFSITE POWER AVAILABLE
XX.TRAINB.XX	S	TRAIN B SUPPORT AVAILABLE
XX.TRAINA.XX	S	TRAIN A SUPPORT SYSTEMS UNAVAILABLE
XX.SLOCA.XX	F	NO SMALL LOCA, SGTR, OR SLBI PRESENT
VL.CCV301.CL	F	P-11B SUCTION GATE VALVE CC-V301 TRANSFERS CLOSED
VL.CCV296.CL	F	P-11B DISCHARGE GATE VALVE CC-V296 TRANSFERS CLOSED
CV.CCV295.CL	F	P-11B DISCHARGE CHECK VALVE CC.V295 TRANSFERS CLOSED