

F EVENT TREES DEVELOPMENT & QUALIFICATION

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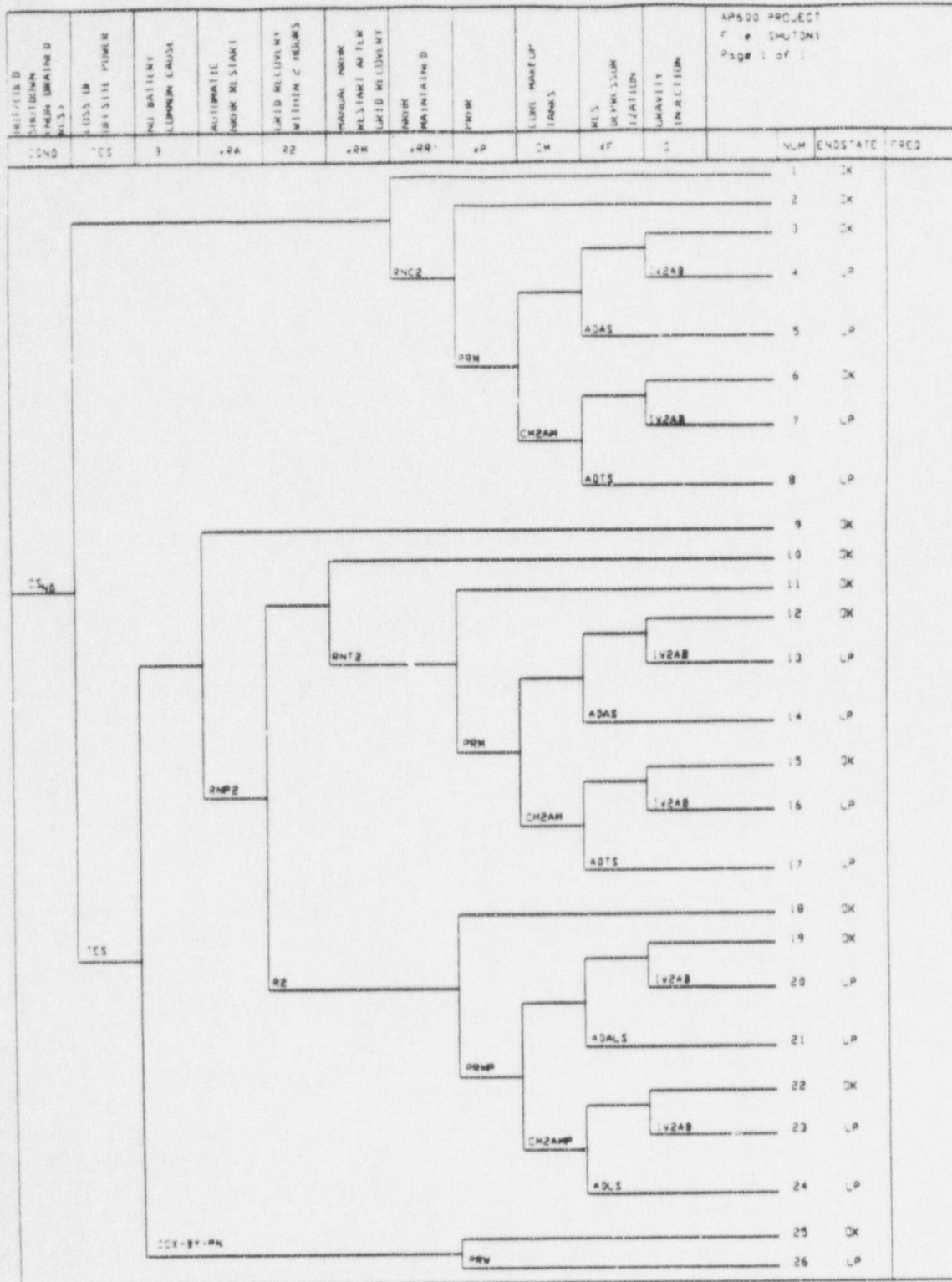



Figure F-24

Loss of Decay Heat Removal During Shutdown Event Tree

Enclosure 1



ET-NRC-93-3965

SEPTEMBER 20, 1993



**AP600**  
**Sensitivity Analyses**

July 1993

## 1.0 Introduction

This document supports RAI response 720.12, revision 1. Four separate sensitivity analyses were performed. The methodology and results of the analyses are described in the following sections.

## 2.0 Sensitivity Analyses

Sensitivity analyses were performed to evaluate the impact of dominant basic events and dominant groups of mechanical or electrical components on the AP600 release category and core damage frequencies during power operation. The sensitivity analyses performed are:

- Impact of dominant basic events on core damage and release category frequencies

Based on the importance analysis results for core damage and release categories (Tables F-8A and G-6 in Appendices F and G of the AP600 Probabilistic Risk Assessment Report), the failure probabilities of the most dominant basic events (those basic events having importance factors greater than or equal to 1 percent) were increased by a factor of 10. The failure probabilities were then used to evaluate their impact on the core damage frequency and release category frequencies.

- Impact of protection system component common cause failures on core damage frequency and release category frequencies

The preceding methodology was used for this sensitivity analysis with one exception: only the dominant protection system component common cause failures were taken into consideration.

- Impact of check valve group, motor-operated valve group, and operator action group on core damage frequency

These sensitivity analyses considered the impact of increasing the failure probabilities by a factor of 10 of the dominant check valves, motor-operated valves, and operator errors on the core damage frequency.

- Impact of motor-operated valve group and operator action group on CI release category frequency

These sensitivity analyses considered the impact of increasing the failure probabilities by a factor of 10 of the dominant motor-operated valves and operator errors on CI release category frequency.

## 3.0 Results

The following are the results from the sensitivity analyses:

- Increasing an individual basic event failure probability by a factor of 10 does not affect the core damage and CI release category frequencies significantly. (See Tables 720.12-1 and -4). However, some failures affect individual release categories OKP and CC. (See Tables 720.12-2 and -3).

- Increasing the probability of the group of dominant protection system component common cause failures by a factor of 10 affects the core damage frequency by a factor of 4.2 and the CI release category frequency by a factor of 5.5. (See Tables 720.12-5 and -8).
- Factors of the OKP and CC release category frequencies are linearly related to those of the dominant protection system component common cause failures. That is, if the dominant protection system component common cause failures are increased by a factor of 10, then the OKP and CC release category frequencies will be increased by a factor of 10. (See Tables 720.12-6 and -7).
- Increasing the probability of the group of dominant IRWST check valves by a factor of 10 increases the core damage frequency by a factor of 13.6 due to the multiple check valves appearing in the same cutset. Also, these same cutsets are counted for more than once (e.g. one for each basic event); this causes some over-estimation of the total importance of all basic events in this group. However, in this case the over-estimation is not large enough to warrant correction action. (See Table 720.12-9.)
- Increasing the probability of the group of dominant motor-operated valves by a factor of 10 affects the core damage and release category frequencies by less than a factor of 4. (See Tables 720.12-10 and -12.)
- Increasing all dominant operator action failure probabilities by a factor of 10 affects the core damage frequency by a factor of 3.6 and the CI release category frequency by a factor of 6.5. (See Tables 720.12-11 and -13.)

#### 4.0 Conclusion

Increase in the failure probabilities of the dominant basic events or the dominant component groups (e.g. check valve group, motor-operated valve group, operator action group, etc.) by a factor of 10 does not result in the core damage and the total release category frequencies that exceed the Westinghouse design goals ( $1.0E-05$  for core damage and  $1.0E-06$  for release.)

Table 720.12-1

(Sheet 1 of 2)

Impact of Dominant Basic Events on Core Damage Frequency  
(At Power)

Basic Event I.D. *	Base Case Basic Event Failure Prob.  (q)	Sensitivity Study Basic Event Failure Prob.  (q <sub>1</sub> = 10q)	Sensitivity Study Core Damage Frequency with q <sub>1</sub>  (F <sub>1</sub> )	Core Damage Frequency Increasing Factor  (R = F <sub>1</sub> / 3.3E-07)**
CCX-DAS	1.00E-03	1.00E-02	8.6E-07	2.6
IWX-CV-AO	1.50E-04	1.50E-03	8.1E-07	2.4
LPM-MAN03	8.30E-02	8.30E-01	8.1E-07	2.4
DAS	9.00E-03	9.00E-02	6.9E-07	2.1
CCX-40EAI	1.40E-05	1.40E-04	6.3E-07	1.9
CCX-HARD1	3.30E-05	3.30E-04	6.1E-07	1.8
ATW-MAN03	1.53E-02	1.53E-01	6.0E-07	1.8
RCX-RB-FA	1.80E-04	1.80E-03	5.5E-07	1.7
IWACV122AO	8.76E-03	8.76E-02	5.0E-07	1.5
IWACV123AO	8.76E-03	8.76E-02	5.0E-07	1.5
IWACV124AO	8.76E-03	8.76E-02	5.0E-07	1.5
IWACV125AO	8.76E-03	8.76E-02	5.0E-07	1.5
MGSET	8.74E-03	8.74E-02	4.9E-07	1.5
CCX-51EHX	5.30E-06	5.30E-05	4.7E-07	1.4
CCX-03XTS	1.80E-05	1.80E-04	4.6E-07	1.4
CCX-AV-LA	6.20E-05	6.20E-04	4.4E-07	1.3
CCX-TT-UF	1.40E-04	1.40E-03	4.3E-07	1.3
CCX-DU-SA	7.30E-05	7.30E-04	4.2E-07	1.3
CCX-EEMM12	3.20E-06	3.20E-05	4.2E-07	1.3
DIS	9.00E-03	9.00E-02	4.1E-07	1.2
LPM-MAN04	8.30E-02	8.30E-01	4.1E-07	1.2
CCX-19-YA	3.00E-06	3.00E-05	4.1E-07	1.2
LPM-MAN01	2.20E-03	2.20E-02	4.0E-07	1.2
IWX-CV1-AO	6.00E-05	6.00E-04	4.0E-07	1.2

Table 720.12-1  
(Sheet 2 of 2)

Impact of Dominant Basic Events on Core Damage Frequency  
(At Power)

Basic Event I.D. *	Base Case Basic Event Failure Prob.  (q)	Sensitivity Study Basic Event Failure Prob.  (q <sub>i</sub> = 10q)	Sensitivity Study Core Damage Frequency with q <sub>i</sub>  (F <sub>i</sub> )	Core Damage Frequency Increasing Factor  (R = F <sub>i</sub> / 3.3E-07)**
OTH-PM1	2.10E-02	2.10E-01	3.9E-07	1.2
IWA-PLUG	5.00E-05	5.00E-04	3.9E-07	1.2
OTH-SGTR1	8.00E-03	8.00E-02	3.8E-07	1.1
RNNMOD08	1.16E-02	1.16E-01	3.7E-07	1.1
RNNMOD05	1.14E-02	1.14E-01	3.7E-07	1.1
REAMV117GO	1.10E-02	1.10E-01	3.7E-07	1.1
REAMV118GO	1.10E-02	1.10E-01	3.7E-07	1.1
ZANMOD02A	1.27E-02	1.27E-01	3.7E-07	1.1
OTH-SGTR	1.60E-02	1.60E-01	3.7E-07	1.1

\*Dominant basic faults in the analysis having importance factor greater than or equal to 1% (see Table F-8A in AP600 Probabilistic Risk Assessment).

\*\*Core damage frequency (CDF) increasing factor was calculated as the new CDF (F<sub>i</sub>) shown in this table divided by the base case CDF (3.3E-07).

Table 720.12-2

Impact of Dominant Basic Events on OKP Release Category Frequency  
(At Power)

Basic Event I.D. *	Base Case Basic Event Failure Prob.  (q)	Sensitivity Study Basic Event Failure Prob.  (q <sub>1</sub> = 10q)	Sensitivity Study OKP Release Category Frequency with q <sub>1</sub>  (F <sub>1</sub> )	OKP Release Category Frequency Increasing Factor  (R = F <sub>1</sub> / 5.6E-08)**
CCX-DAS	1.00E-03	1.00E-02	5.4E-07	9.6
CCX-40EAI	1.40E-05	1.40E-04	3.4E-07	6.1
CCX-51EHX	5.30E-06	5.30E-05	1.6E-07	2.8
CCX-EEMM12	3.20E-06	3.20E-05	1.2E-07	2.1
CCX-19-YA	3.00E-06	3.00E-05	1.1E-07	2.0
DAS	9.00E-03	9.00E-02	7.7E-08	1.4
DIS	9.00E-03	9.00E-02	7.7E-08	1.4

\*Dominant basic faults in the analysis having importance factor greater than or equal to 1% (see Table G-6 in AP600 Probabilistic Risk Assessment).

\*\*OKP release category frequency increasing factor was calculated as the new OKP release category frequency (F<sub>1</sub>) shown in this table divided by the base case OKP release category frequency (5.6E-08).

Table 720.12-3

Impact of Dominant Basic Events on CC Release Category Frequency  
(At Power)

Basic Event I.D. *	Base Case Basic Event Failure Prob. (q)	Sensitivity Study Basic Event Failure Prob. (q <sub>i</sub> = 10q)	Sensitivity Study CC Release Category Frequency with q <sub>i</sub> (F <sub>i</sub> )	CC Release Category Frequency Increasing Factor (R = F <sub>i</sub> / 7.6E-10)**
CCX-AV-LA	6.20E-05	6.20E-04	7.4E-09	9.7
LPM-MAN03	8.30E-02	8.30E-01	6.9E-09	9.1
CCX-HARD1	3.30E-05	3.30E-04	4.2E-09	5.5
CCX-03XTS	1.80E-05	1.80E-04	2.6E-09	3.4
DIS	9.00E-03	9.00E-02	1.3E-09	1.7
CCX-51EHX	5.30E-06	5.30E-05	1.3E-09	1.7
CCX-EP-SA	4.40E-06	4.40E-05	1.2E-09	1.6
CCX-EEMM12	3.20E-06	3.20E-05	1.1E-09	1.4
CCX-19-YA	3.00E-06	3.00E-05	1.0E-09	1.4
DAS	1.00E-03	1.00E-02	9.1E-10	1.2

\*Dominant basic faults in the analysis having importance factor greater than or equal to 1% (see Table G-6 in AP600 Probabilistic Risk Assessment).

\*\*CC release category frequency increasing factor was calculated as the new CC release category frequency (F<sub>i</sub>) shown in this table divided by the base case CC release category frequency (7.6E-10).



Table 720.12-4

(Sheet 1 of 2)

Impact of Dominant Basic Events on CI Release Category Frequency  
(At Power)

Basic Event I.D. *	Base Case Basic Event Failure Prob.  (q)	Sensitivity Study Basic Event Failure Prob.  (q <sub>i</sub> = 10q)	Sensitivity Study CI Release Category Frequency with q <sub>i</sub>  (F <sub>i</sub> )	CI Release Category Frequency Increasing Factor  (R = F <sub>i</sub> / 2.0E-08)**
LPM-MAN03	8.30E-02	8.30E-01	7.9E-08	3.9
OTH-SGTR1	8.00E-03	8.00E-02	5.9E-08	2.9
OTH-PM1	2.10E-02	2.10E-01	5.8E-08	2.9
OTH-CNB	5.00E-02	5.00E-01	5.4E-08	2.7
CCX-DAS	1.00E-03	1.00E-02	5.3E-08	2.7
OTH-SGTR	1.60E-02	1.60E-01	5.0E-08	2.5
CCX-40EAI	1.40E-05	1.40E-04	4.8E-08	2.4
CCX-HARD1	3.30E-05	3.30E-04	4.7E-08	2.3
CIX-MAN00	1.00E-01	1.00E+00	4.7E-08	2.3
OTH-PM	1.10E-02	1.10E-01	4.4E-08	2.2
DAS	9.00E-03	9.00E-02	3.8E-08	1.9
PO	2.50E-03	2.50E-02	3.4E-08	1.7
TIME-CVSNO	9.85E-01	9.85E+00	3.4E-08	1.7
ATW-MAN03	1.53E-02	1.53E-01	3.3E-08	1.7
CCX-FU-RQ	2.80E-07	2.80E-06	3.3E-08	1.7
CCX-03XTS	1.80E-05	1.80E-04	3.3E-08	1.7
RCX-RB-FA	1.80E-04	1.80E-03	3.1E-08	1.6
SFN-MAN00	9.40E-04	9.40E-03	3.1E-08	1.5
SFNMV038GO	8.76E-02	8.76E-01	3.0E-08	1.5
CCX-TT-UF	1.40E-04	1.40E-03	2.9E-08	1.4
CVNAV171LA	8.76E-03	8.76E-02	2.9E-08	1.4
MGSET	8.74E-03	8.74E-02	2.8E-08	1.5
DIS	9.00E-03	9.00E-02	2.6E-08	1.3
OTH-VAL2	2.00E-01	2.00E+00	2.6E-08	1.3

Table 720.12-4

(Sheet 2 of 2)

Impact of Dominant Basic Events on CI Release Category Frequency  
(At Power)

Basic Event I.D. *	Base Case Basic Event Failure Prob.  (q)	Sensitivity Study Basic Event Failure prob.  (q <sub>i</sub> = 10q)	Sensitivity Study CI Release Category Frequency with q <sub>i</sub>  (F <sub>i</sub> )	CI Release Category Frequency Increasing Factor  (R = F <sub>i</sub> / 2.0E-08)**
CCX-51EHX	5.30E-06	5.30E-05	2.6E-08	1.3
IWX-CV-AO	1.50E-04	1.50E-03	2.6E-08	1.3
CIX-AV-LA	7.70E-04	7.70E-03	2.6E-08	1.3
TIME-CVSO	1.50E-02	1.50E-01	2.6E-08	1.3
OTH-R05	5.90E-01	5.90E+00	2.5E-08	1.3
CCX-AV-LA	6.20E-05	6.20E-04	2.5E-08	1.3
CCX-DU-SA	7.30E-05	7.30E-04	2.5E-08	1.2
CCX-EEMM12	3.20E-06	3.20E-05	2.4E-08	1.2
CCX-BY-PN	3.90E-05	3.90E-04	2.3E-08	1.2
CCX-EP-SA	4.40E-06	4.40E-05	2.3E-08	1.1
RNNMOD08	1.16E-02	1.16E-01	2.3E-08	1.1
RNNMOD05	1.14E-02	1.14E-01	2.3E-08	1.1
REAMV117GO	1.10E-02	1.10E-01	2.3E-08	1.1
REAMV118GO	1.10E-02	1.10E-01	2.3E-08	1.1
CCX-19-YA	3.00E-06	3.00E-05	2.2E-08	1.1
CCX-19-SA	1.10E-05	1.10E-04	2.2E-08	1.1
LPM-MAN01	2.20E-03	2.20E-02	2.2E-08	1.1
PMX-PLC	1.10E-05	1.10E-04	2.2E-08	1.1
MSGTR	3.20E-02	3.20E-01	2.2E-08	1.1
ZANMOD02	1.27E-02	1.27E-01	2.2E-08	1.1

\*Dominant basic faults in the analysis having importance factor greater than or equal to 1% (see Table G-6 in AP600 Probabilistic Risk Assessment).

\*\*CI release category frequency increasing factor was calculated as the new CI release category frequency (F<sub>i</sub>) shown in this table divided by the base case CI release category frequency (2.0E-08).

Table 720.12-5

Impact of Dominant Protection System Component Common Cause Failures  
on Core Damage Frequency  
(At Power)

Basic Event I.D. *	Base Case Basic Event Failure Prob.  (q)	Sensitivity Study Basic Event Failure Prob.  (q <sub>i</sub> = 10q)	Sensitivity Study Core Damage Frequency with q <sub>i</sub> 's  (F <sub>i</sub> )	Core Damage Frequency Increasing Factor  (R = F <sub>i</sub> / 3.3E-07)**
CCX-40EAI	1.40E-05	1.40E-04	1.4E-06	4.2
CCX-HARD1	3.30E-05	3.30E-04		
CCX-51EHX	5.30E-06	5.30E-05		
CCX-03XTS	1.80E-05	1.80E-04		
CCX-DU-SA	7.30E-05	7.30E-04		
CCX-EEMM12	3.20E-06	3.20E-05		
CCX-19-YA	3.00E-06	3.00E-05		

\*Dominant protection system component common cause failures having importance factor greater than or equal to 1% (see Table F-8A in AP600 Probabilistic Risk Assessment).

\*\*Core damage frequency (CDF) increasing factor was calculated as the new CDF (F<sub>i</sub>) shown in this table divided by the base case CDF (3.3E-07).

Table 720.12-6

Impact of Dominant Protection System Component Common Cause Failures  
on OKP Release Category Frequency  
(At Power)

Basic Event I.D. *	Base Case Basic Event Failure Prob. (q)	Sensitivity Study Basic Event Failure Prob. (q <sub>1</sub> = 10q)	Sensitivity Study OKP Release Category Frequency with q <sub>1</sub> 's (F <sub>1</sub> )	OKP Release Category Frequency Increasing Factor (R = F <sub>1</sub> / 5.6E-08)**
CCX-40EAI	1.40E-05	1.40E-04	5.6E-07	10.0
CCX-51EHX	5.30E-06	5.30E-05		
CCX-EEMM12	3.20E-06	3.20E-05		
CCX-19-YA	3.00E-06	3.00E-05		

\*Dominant protection system component common cause failures having importance factor greater than or equal to 1% (see Table G-6 in AP600 Probabilistic Risk Assessment).

\*\*OKP release category frequency increasing factor was calculated as the new OKP release category frequency (F<sub>1</sub>) shown in this table divided by the base case OKP release category frequency (5.6E-08).

Table 720.12-7

Impact of Dominant Protection System Component Common Cause Failures  
on CC Release Category Frequency  
(At Power)

Basic Event I.D. *	Base Case Basic Event Failure Prob.  (q)	Sensitivity Study Basic Event Failure Prob.  (q <sub>i</sub> = 10q)	Sensitivity Study CC Release Category Frequency with q <sub>i</sub> 's  (F <sub>i</sub> )	CC Release Category Frequency Increasing Factor  (R = F <sub>i</sub> / 7.6E-10)**
CCX-HARD1	3.30E-05	3.30E-04	7.6E-09	10.0
CCX-03XTS	1.80E-05	1.80E-04		
CCX-51EHX	5.30E-06	5.30E-05		
CCX-EP-SA	4.40E-06	4.40E-05		
CCX-EEMM12	3.20E-06	3.20E-05		
CCX-19-YA	3.00E-06	3.00E-05		

\*Dominant protection system component common cause failures having importance factor greater than or equal to 1% (see Table G-6 in AP600 Probabilistic Risk Assessment).

\*\*CC release category frequency increasing factor was calculated as the new CC release category frequency (F<sub>i</sub>) shown in this table divided by the base case CC release category frequency (7.6E-10).

Table 720.12-8

Impact of Dominant Protection System Component Common Cause Failures  
on CI Release Category Frequency  
(At Power)

Basic Event I.D. *	Base Case Basic Event Failure Prob. (q)	Sensitivity Study Basic Event Failure Prob. (q <sub>i</sub> = 10q)	Sensitivity Study CI Release Category Frequency with q <sub>i</sub> 's (F <sub>i</sub> )	CI Release Category Frequency Increasing Factor (R = F <sub>i</sub> / 2.0E-08)**
CCX-40EAI	1.40E-05	1.40E-04	1.1E-07	5.5
CCX-HARD1	3.30E-05	3.30E-04		
CCX-03XTS	1.80E-05	1.80E-04		
CCX-51EHX	5.30E-06	5.30E-05		
CCX-DU-SA	7.30E-05	7.30E-04		
CCX-EEMM12	3.20E-06	3.20E-05		
CCX-EP-SA	4.40E-06	4.40E-05		
CCX-19-YA	3.00E-06	3.00E-05		
CCX-19-SA	1.10E-05	1.10E-04		

\*Dominant protection system component common cause failures having importance factor greater than or equal to 1% (see Table G-6 in AP600 Probabilistic Risk Assessment).

\*\*CI release category frequency increasing factor was calculated as the new CI release category frequency (F<sub>i</sub>) shown in this table divided by the base case CI release category frequency (2.0E-08).

Table 720.12-9

Impact of Dominant Check Valve Group  
on Core Damage Frequency  
(At Power)

Basic Event I.D. *	Base Case Basic Event Failure Prob.  (q)**	Sensitivity Study Basic Event Failure Prob.  (q <sub>1</sub> = 10q)	Sensitivity Study Core Damage Frequency with q <sub>1</sub> 's  (F <sub>1</sub> )	Core Damage Frequency Increasing Factor  (R = F <sub>1</sub> / 3.3E-07)***
IWACV122AO	8.76E-03	8.76E-02	4.5E-06	13.6
IWACV123AO	8.76E-03	8.76E-02		
IWACV124AO	8.76E-03	8.76E-02		
IWACV125AO	8.76E-03	8.76E-02		
IWX-CV-AO	1.50E-04	1.50E-03		
IWX-CV1-AO	6.00E-05	6.00E-04		

\*Dominant check valves (and their common cause) in the analysis having importance factor greater than or equal to 1% (see Table F-8A in AP600 Probabilistic Risk Assessment).

\*\*The check valve group consists of RWST check valves whose failure probability in the base case PRA is based on the conservative "adverse conditions" check valve failure rate.

\*\*\*Core damage frequency (CDF) increasing factor was calculated as the new CDF (F<sub>1</sub>) shown in this table divided by the base case CDF (3.3E-07).

Table 720.12-10

Impact of Dominant Motor-Operated Valve Group  
on Core Damage Frequency  
(At Power)

Basic Event I.D. *	Base Case Basic Event Failure Prob.  (q)	Sensitivity Study Basic Event Failure Prob.  (q <sub>i</sub> = 10q)	Sensitivity Study Core Damage Frequency with q <sub>i</sub> 's  (F <sub>i</sub> )	Core Damage Frequency Increasing Factor  (R= F <sub>i</sub> / 3.3E-07)**
REAMV117GO	1.10E-02	1.10E-01	4.0E-07	1.2
REAMV118GO	1.10E-02	1.10E-01		

\*Dominant motor-operated valves in the analysis having importance factor greater than or equal to 1% (see Table F-8A in AP600 Probabilistic Risk Assessment).

\*\*Core damage frequency (CDF) increasing factor was calculated as the new CDF (F<sub>i</sub>) shown in this table divided by the base case CDF (3.3E-07).



Table 720.12-11

Impact of Dominant Operator Action Group  
on Core Damage Frequency  
(At Power)

Basic Event I.D. *	Base Case Basic Event Failure Prob. (q)	Sensitivity Study Basic Event Failure Prob. ( $q_i = 10q$ )	Sensitivity Study Core Damage Frequency with $q_i$ 's ( $F_i$ )	Core Damage Frequency Increasing Factor ( $R = F_i / 3.3E-07$ )**
LPM-MAN03	8.30E-02	8.30E-01	1.2E-06	3.6
ATW-MAN03	1.53E-02	1.53E-01		
LPM-MAN04	8.30E-02	8.30E-01		
LPM-MAN01	2.20E-03	2.20E-02		

\*Dominant operator actions in the analysis having importance factor greater than or equal to 1% (see Table F-8A in AP600 Probabilistic Risk Assessment).

\*\*Core damage frequency (CDF) increasing factor was calculated as the new CDF ( $F_i$ ) shown in this table divided by the base case CDF (3.3E-07).

Table 720.12-12

Impact of Dominant Motor-Operated Valve Group  
on CI Release Category Frequency  
(At Power)

Basic Event I.D. *	Base Case Basic Event Failure Prob.  (q)	Sensitivity Study Basic Event Failure prob.  ( $q_i = 10q$ )	Sensitivity Study CI Release Category Frequency with $q_i$ 's  ( $F_i$ )	CI Release Category Frequency Increasing Factor  ( $R = F_i / 2.0E-08$ )**
REAMV117GO	1.10E-02	1.10E-01	4.4E-08	2.2
REAMV118GO	1.10E-02	1.10E-01		
SFNMV038GO	8.76E-02	8.76E-01		

\*Dominant motor operated valves in the analysis having importance factor greater than or equal to 1% (see Table G-6 in AP600 Probabilistic Risk Assessment).

\*\*CI release category frequency increasing factor was calculated as the new CI release category frequency ( $F_i$ ) shown in this table divided by the base case CI release category frequency (2.0E-08).

Table 720.12-13

Impact of Dominant Operator Action Group  
on CI Release Category Frequency  
(At Power)

Basic Event I.D. *	Base Case Basic Event Failure Prob. (q)	Sensitivity Study Basic Event Failure Prob. (q <sub>i</sub> = 10q)	Sensitivity Study CI Release Category Frequency with q <sub>i</sub> 's (F <sub>i</sub> )	CI Release Category Frequency Increasing Factor (R = F <sub>i</sub> / 2.0E-08)**
LPM-MAN03	8.30E-02	8.30E-01	1.3E-07	6.5
CIX-MAN00	1.00E-01	1.00E+00		
ATW-MAN03	1.53E-02	1.53E-01		
SFN-MAN00	9.40E-04	9.40E-03		
LPM-MAN01	2.20E-03	2.20E-02		

\*Dominant operator actions in the analysis having importance factor greater than or equal to 1% (see Table G-6 in AP600 Probabilistic Risk Assessment).

\*\*CI release category frequency increasing factor was calculated as the new CI release category frequency (F<sub>i</sub>) shown in this table divided by the base case CI release category frequency (2.0E-08).