This copy of the PSTG and Appendix A are maintained marked up in anticipation for the next revision. Items are marked up in red to show desired changes and the source of that change. An index maintained below identifies effected pages. [signature] HELKER 2-4-91

Marked up Page	Description	Source
57 (App A)	Missing the word "not"	NRC EOP inspection
267 (App A)	Deviations clarified	NRC EOP inspection
268 (App A)	Variance added c/ level Band	NRC EOP inspection
195 (App A)	Deviation added for deleting "...	NRC EOP Inspection
203 (App A)	Add (2) to EPG step	NRC EOP Inspection
App. A 205	ref. to EOP-6 Att 18 should be 12	NRC EOP Inspection
App A	Pages 88-134 missing from Issued copies	Jerry
App A p. 22	update PSTG section to match real PSTG	NRC EOP Inspection
PSTG pgs... 29, 33, 34, 36, 46, 53, 68 App A pgs...: 26, 47, 48 49, 55, 56 58, 182	Delete OP references where specifically ID'd in PSTG - should be stand alone document Still need to M/U App A pages corresponding to PSTG p. 46, and 53	NRC EOP INSPECT.
App A p. 235	Add variance c/ not including words	NRC EOP Insp.
App A p. 205	Add variance c/ reformat at top of C2	NRC EOP INSP.
App A: pgs 157, 163, 169	Add variance for underlining "except"	NRC EOP Insp.

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CONTROLLED

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FOR INFORMATION ONLY

PREPARED BY:	M. Yeminy	(NMPC ENGINEERING)	12-6-90 DATE
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CONCURRENCE BY:	J. B. Helker	OPs Supv. (NMPC OPERATIONS)	12-6-90 DATE

NINE MILE POINT
UNIT 2

PLANT SPECIFIC TECHNICAL GUIDELINES

NIAGARA MOHAWK

December 1990

TABLE OF CONTENTS

INTRODUCTION

This document delineates the requisite technical content of the NMP2 Emergency Operating Procedures. The Plant Specific Technical Guidelines (PSTGs) contained herein, were derived from Revision 4 of the BWR Owners' Group Emergency Procedure Guidelines (EPGs), dated March 1987. Appendix A of this document provides a step by step comparison of the EPGs and the NMP2 PSTGs, identifying and justifying all variances. Much of the technical terminology in these PSTGs is abbreviated. The key to these abbreviations is in Table A.

Most of the quantitative values in these PSTGs were derived from NMP2 calculation No. A10.1-AC-001 Rev. 2 titled Plant Specific Technical Guidelines Input Parameters dated October, 1990. Some of these values are listed in Table B titled "Operational Limits and Setpoints", while the others are presented graphically in Table C titled "Operational Limits - Figures". When given a choice in the EPG to select a given limit based upon its value, the limit which is not used is crossed out in Table B. It is still left in a readable format such that the basis for the value remains. It is important to note that some plant parameters do not reach the end point of their calculated values and therefore the associated figures were truncated at the most limiting parameter and do not reach the calculated values (eg: the LPCS Pump Vortex Limit curve is truncated at plant elevation 192 ft. which is the lowest instrumented suppression pool water level while the associated calculation permits operation of the pump down to water level at plant elevation 189.59 ft.).

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Several PSTG steps impose bypassing of safety system interlocks and initiation logic. Such actions are required to safely mitigate the consequences of degraded conditions, and are generally specified only when conditions exist for which the interlocks or logic features were not designed. Bypassing other interlocks may be required due to instrument failure or other such conditions. These interlocks, however, cannot be defined in advance and are therefore not specified in the PSTGs.

The symptomatic operator actions prescribed herein will maintain the reactor plant in a safe condition and optimize the plant response and margin of safety irrespective of the initiating event. However, for certain specific events such as earthquake, tornado, blackout, and fire, emergency response and recovery can be enhanced by additional actions prescribed in supplemental event-specific procedures. These event-specific actions must not contradict or subvert the symptomatic responses prescribed herein or degrade the operability of equipment critical to these responses.

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TABLE A

ABBREVIATIONS

ADS	Automatic Depressurization System
APRM	Average Power Range Monitor
ARI	Alternate Rod Insertion
CRD	Control Rod Drive
ECCS	Emergency Core Cooling System
El.	Elevation
HPCI	High Pressure Coolant Injection
HPCS	High Pressure Core Spray
HVAC	Heating, Ventilating and Air Conditioning
HVR	Heating and Ventilating Control Building
IAS	Instrument Air System
IC	Isolation Condenser
LCO	Limiting Condition for Operation
LPCI	Low Pressure Coolant Injection
LPCS	Low Pressure Core Spray
MARFP	Maximum Alternate RPV Flooding Pressure
MPCWLL	Maximum Primary Containment Water Level Limit
MSCRWL	Minimum Steam Cooling RPV Water Level
MSIV	Main Steam Isolation Valve
NPSH	Net Positive Suction Head
NUREG	Nuclear Regulatory Guide
PSP	Pressure Suppression Pressure
RB	Reactor Building
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RPS	Reactor Protection System
RPV	Reactor Pressure Vessel
RRCS	Redundant Reactivity Control System
RSCS	Rod Sequence Control System
RWCU	Reactor Water Cleanup

EPG (rev. 4) and the PSTG Table C respectively. In most cases, the figures and tables in Table C are developed from calculation A10.1-AC-001 Rev. 2.

Where the word "elevation" (or the abbreviation "El.") is used in this PSTG, it refers to NMP2 plant elevation which is measured as height above sea level.

RWM	Rod Worth Minimizer
SBGT	Standby Gas Treatment
SDC	Shutdown Cooling
SLC	Standby Liquid Control
SLS	Standby Liquid System
SPMS	Suppression Pool Makeup System
SRV	Safety Relief Valve
TAF	Top of Active Fuel

TABLE B

OPERATIONAL LIMITS AND SETPOINTS

• ≤ 200 °F	RPV water temperature for cold shutdown conditions [Tech. Spec. Definition 1.28 and Table 1.2]
• 159.3 in.	low level scram setpoint [Tech. Spec. Table 2.2.1-1 item 4]
• 1037 psig	high RPV pressure scram setpoint [Tech. Spec. Table 2.2.1-1 item 3]
• 1.68 psig	high drywell pressure scram setpoint [Tech. Spec. Table 2.2.1-1 item 7]
• 4 %	APRM downscale trip [Tech. Spec. Table 3.3.6-2 item 2.c]
• 02	Maximum Subcritical Banked Withdrawal Position [Calculated by the Nuclear Fuels Group in syracuse]
• 202.3 in.	high level trip setpoint [Tech. Spec. Table 3.3.9.2 item 1.a]
• -14.4 in.	top of active fuel [USAR Fig. 5.2-4 (-14.4 in.), USAR Fig. 5.3-5 and Fig. 1.2-11]
• 1.68 psig	drywell pressure which initiates ECCS [Tech Spec Table 3.3.3.2 items A.1.b and B.1.b]
• 7	number of SRVs dedicated to ADS [USAR 6.3.1.2.4 and Table 6.3-1, USAR Table 1.3-2]
• 960 psig	pressure at which all turbine bypass valves are fully open [NMP2-DFH-88.083]
• El. 192 ft.	lowest instrumented suppression pool water level [N2-ISP-CMS-R104 Att 1&2, 2CMS*LT9A/B]
• 769 pounds	cold shutdown boron weight [Calc.A10.1-AC-001 Rev. 2]
• 100 °F/hr	RPV cooldown rate LCO [Tech. Spec. 3.4.6.1]
• 0 gal	low SLC tank water level trip 807E161T4 sh. 3,4, and 944E309T4 sh. 26]

- 1500 RPM — minimum pump speed limit per pump vendor manual [Bingham Willamente Manual No.VPF 3943-12-6 (NMPC File No. N2-B26500 pump 001]
- 90 °F — most limiting suppression pool temperature LCO [Tech. Spec. 3.6.2.1]
- 150 °F — drywell temperature LCO ~~or maximum normal operating temperature, whichever is higher~~ [Tech. Spec. 3.6.1.6]
- El. 201 ft. — Maximum suppression pool water level LCO [Tech. Spec. 3.6.2.1]
- El. 199.5 ft. — minimum suppression pool water level LCO [Tech. Spec. 3.6.2.1]
- 1.8% — high hydrogen alarm setpoint [N2-ISP-CMS-Q110, Calc. 12177-CS-CMS*07]
- 340 °F — maximum temperature at which ADS is qualified [USAR 5.2.2.4.1] ~~or drywell design temperature, whichever is lower~~ [Tech. Spec.5.2.2.b, and USAR Table 6.2-3]
- El. 217 ft. — highest instrumented suppression pool water level [N2-ISP-CMS-R104 and R101]
- 10.57 psig — suppression chamber spray initiation pressure [Calc. A10.1-AC-001 Rev.1]
- 1 % — minimum detectable hydrogen concentration [SPDS 2CMS*ASH6, N2-ISP-CMS-Q110 and M001]
- 0 % — minimum hydrogen concentration for recombiner operation [Spec. P282K]
- 5 % — maximum hydrogen concentration for recombiner operation ~~or 6%, whichever is lower~~
- 2.5 % — maximum oxygen concentration for recombiner operation (while hydrogen concentration is 5% or over) ~~or 5%, whichever is lower~~ [Spec. P282K]

- 5 % maximum oxygen concentration for recombiner operation (while hydrogen concentration is below 5%) ~~or 5%, whichever is lower~~ [Spec. P282K]
- 17.8 in. ADS initiation setpoint [Tech. Spec. Table 3.3.3-2 item A.2.a and B.2.a]
- 195 psig highest RPV pressure at which the shutoff head of a low-water-quality alternate injection subsystem (excluding SLC) is reached [P222W (condensate & 450 ft. head)]
- 4 Minimum Number of SRVs Required for Emergency Depressurization [Calc A10.1-AC-001 Rev. 2 (page 101)]
- -58.2 in. Minimum Zero Injection RPV Water Level [Calc A10.1-AC-001 Rev. 2 (page 101)]
- 1 minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure [Calc A10.1-AC-001 Rev. 2 (page 101)]
- 61 psig Minimum RPV Flooding Pressure [Calc A10.1-AC-001 Rev. 2 (page 101)]
- -45.6 in. Minimum Steam Cooling RPV Water Level [Calc A10.1-AC-001 Rev. 2 (page 101)]
- 248 ft. 6 in. elevation of the bottom of the lowest recirculation piping [Dwg. EP-70]
- 298 ft. 6 in. elevation of top of active fuel [RPV invert: El.267' 11.875" (USAR Fig. 1.2-11, TAF= 366.31" above RPV invert (USAR Fig. 5.3-5) ie: 298' 6"]
- 10 R/hr. Maximum safe operating radiation level for the secondary containment [Maximum scale readings for RB ARMs]
- 135 °F Maximum safe operating temperature for the secondary containment (personnel access)
- 212°F Maximum safe operating temperature for the secondary containment (EQ) [BWR equipment environmental interface data GE Doc. No. 22A3008 Rev. 5 Section 4.5.1.1]

- 0 psig — Minimum SRV Reopening Pressure
  [FSAR Table 15.03, EPG rev. 4, Appendix C Section 2]
- El. 292.5 ft. — (elevation of containment vent minus adjustment for instrument accuracy)
  [Dwg. EV-1N, EP-121C, PID-61A, USAR Figure 5.3.5, USAR Figure 1.2-11]
- El. 296.5 ft. — (minimum level for Primary Containment flooding)
  [Calc A10.1-AC-001 Rev. 2 (page 101)]
- El. 298.5 ft. — Minimum Steam Cooling RPV Water Level
  [Calc A10.1-AC-001 Rev. 2 (page 101)]

TABLE C
OPERATIONAL LIMITS - FIGURES

BORON INJECTION INITIATION TEMPERATURE

HPCS PUMP NPSH LIMIT

LPCS PUMP NPSH LIMIT

RHR PUMPS NPSH LIMIT

HPCS PUMP VORTEX LIMIT

LPCS PUMP VORTEX LIMIT

RHR PUMP VORTEX LIMIT

DRYWELL SPRAY INITIATION PRESSURE LIMIT

HEAT CAPACITY LEVEL LIMIT

HEAT CAPACITY TEMPERATURE LIMIT

MAXIMUM CORE UNCOVERY TIME LIMIT

MAX. PRIMARY CONTAINMENT WATER LEVEL LIMIT

PRIMARY CONTAINMENT PRESSURE LIMIT

PRESSURE SUPPRESSION PRESSURE

RPV SATURATION TEMPERATURE

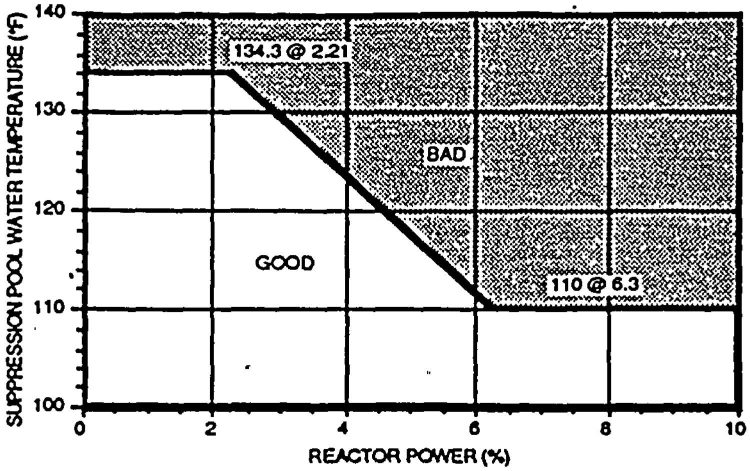
SRV TAILPIPE LEVEL LIMIT

OFFGAS RELEASE RATE

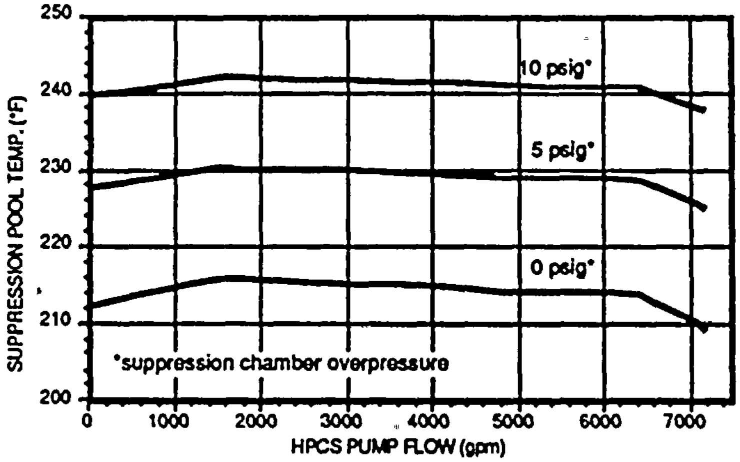
MSL RAD LIMIT

TURBINE BUILDING RELEASE RATE

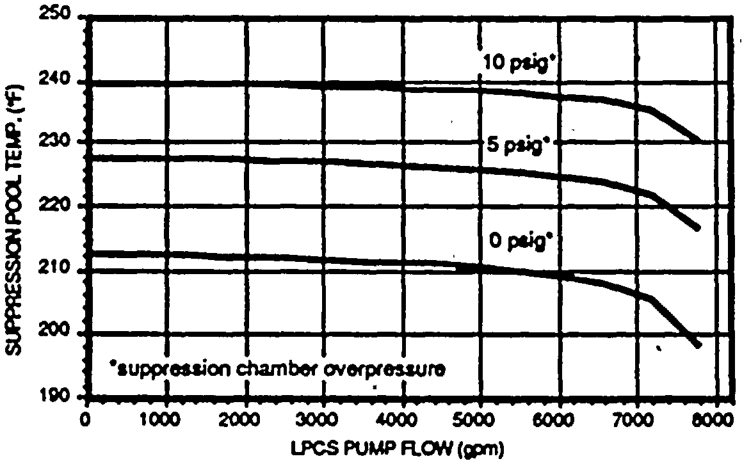
BORON INJECTION INITIATION TEMPERATURE

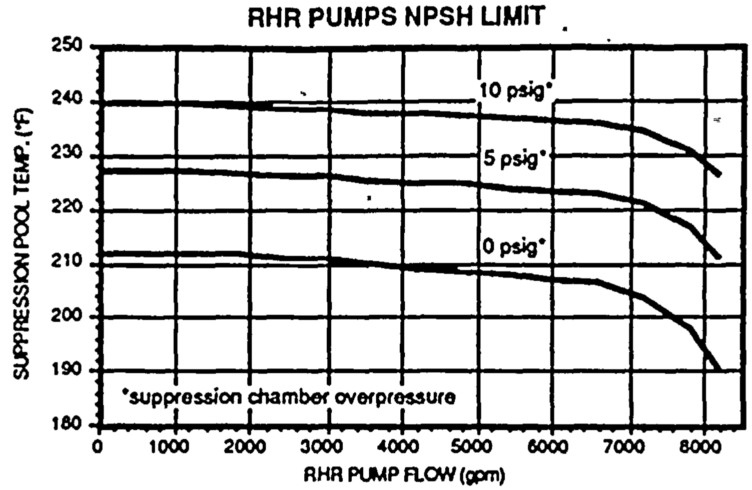


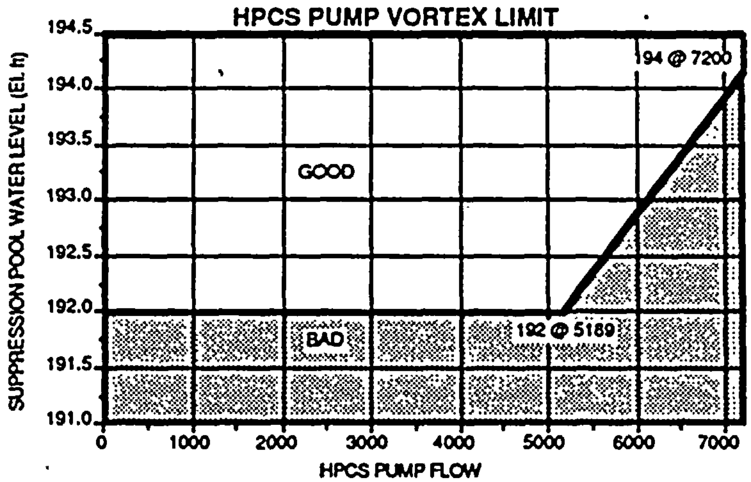
HPCS PUMP NPSH LIMIT

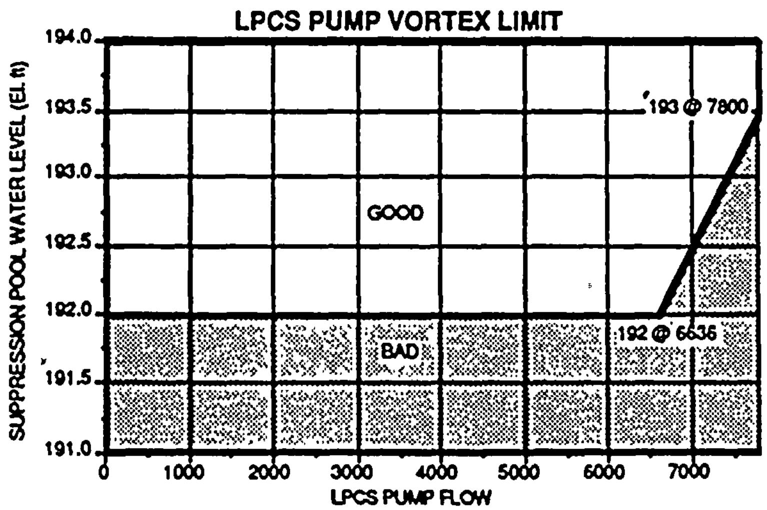


LPCS PUMP NPSH LIMIT

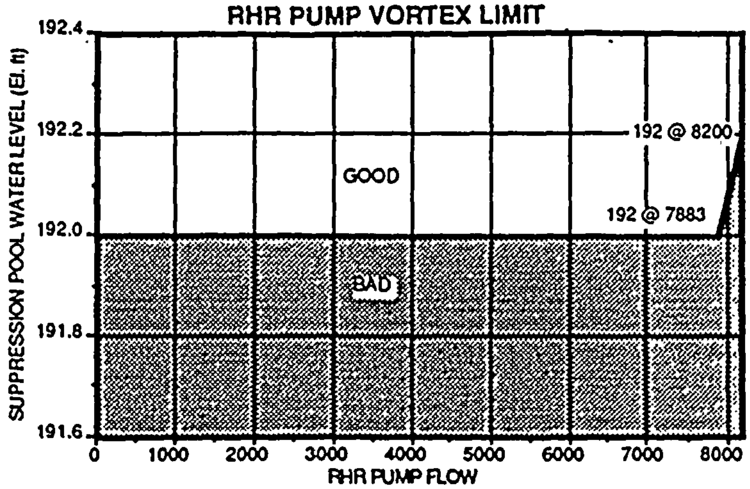



RHR PUMPS NPSH LIMIT
SUPPRESSION POOL TEMP. (°F)
250
240
230
220
210
200
190
180
10 psig*
5 psig*
0 psig*
*suppression chamber overpressure
0
1000
2000
3000
4000
5000
6000
7000
8000
RHR PUMP FLOW (gpm)

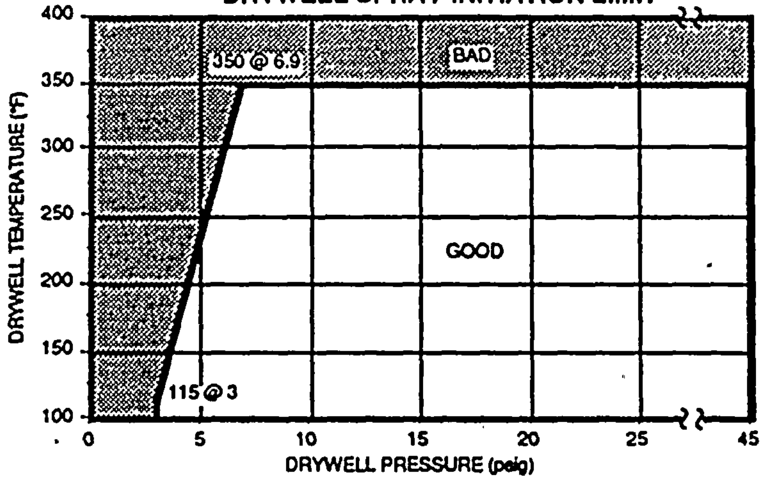

HPCS PUMP VORTEX LIMIT
SUPPRESSION POOL WATER LEVEL (EL ft)
194.5
194.0
193.5
193.0
192.5
192.0
191.5
191.0
GOOD
BAD
194 @ 7200
192 @ 5189
0
1000
2000
3000
4000
5000
6000
7000
HPCS PUMP FLOW


LPCS PUMP VORTEX LIMIT
SUPPRESSION POOL WATER LEVEL (EL ft)
194.0
193.5
193.0
192.5
192.0
191.5
191.0
GOOD
BAD
193 @ 7800
192 @ 6636
0
1000
2000
3000
4000
5000
6000
7000
LPCS PUMP FLOW

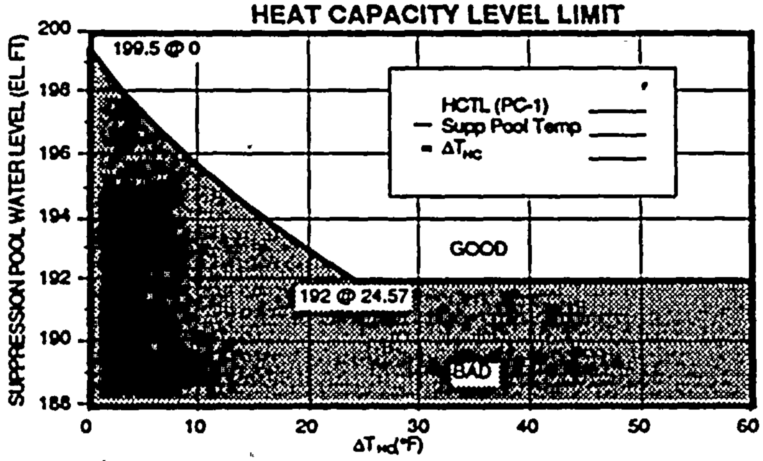
RHR PUMP VORTEX LIMIT



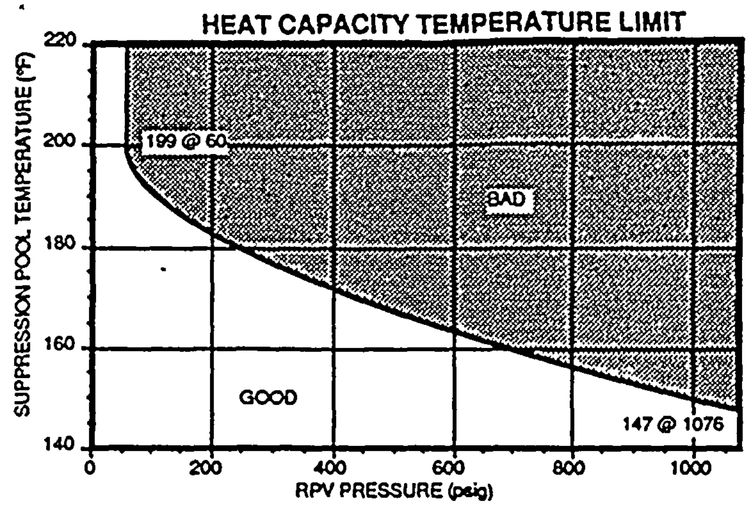
DRYWELL SPRAY INITIATION LIMIT

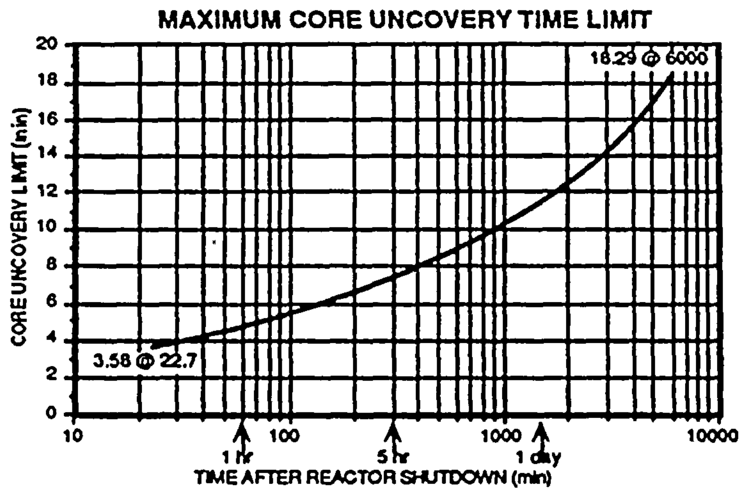


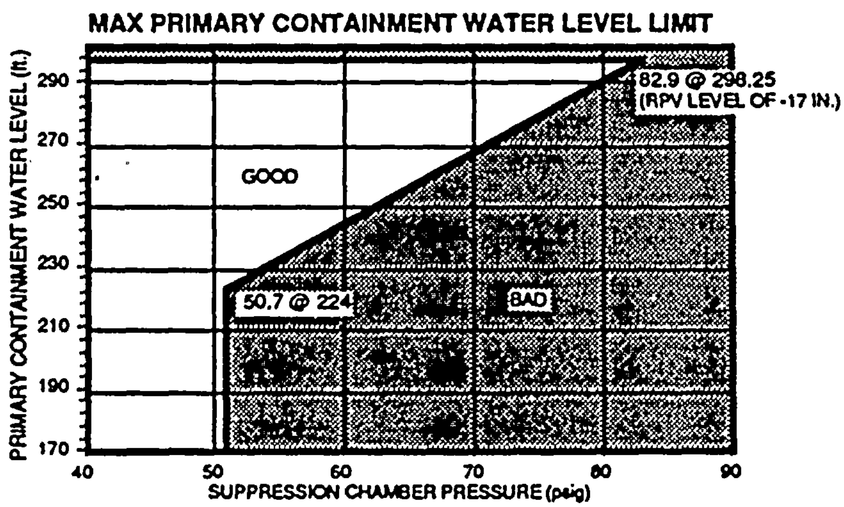
HEAT CAPACITY LEVEL LIMIT

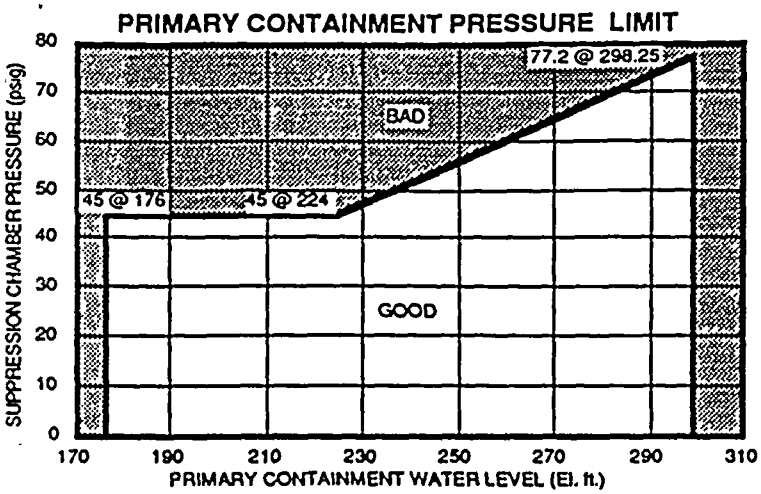


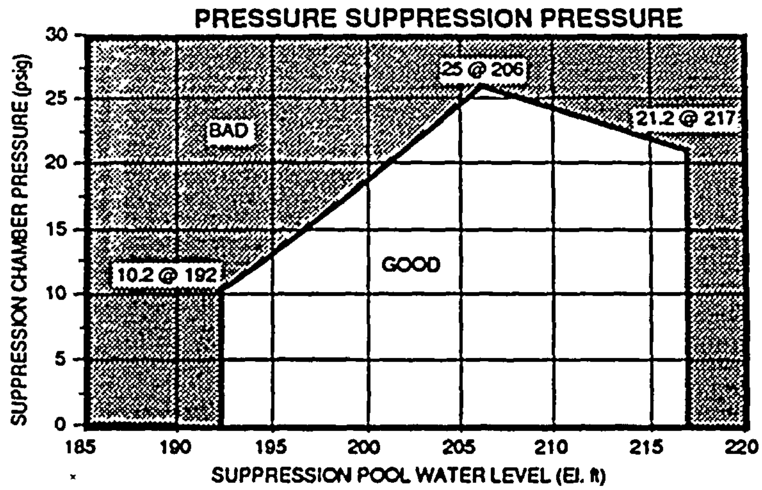
where ΔT_{HC} = (Heat Capacity Temp Limit) - (Suppression Pool Temp)
PC-1

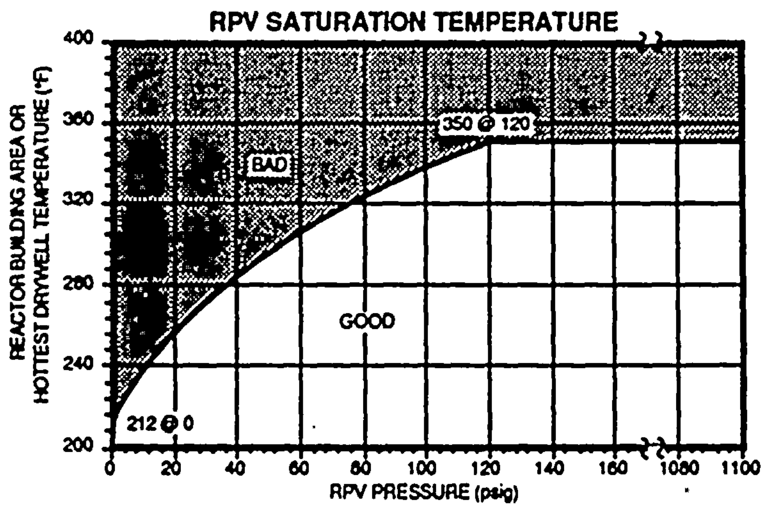

HEAT CAPACITY TEMPERATURE LIMIT
SUPPRESSION POOL TEMPERATURE (°F)
RPV PRESSURE (psig)
199 @ 60
BAD
GOOD
147 @ 1076

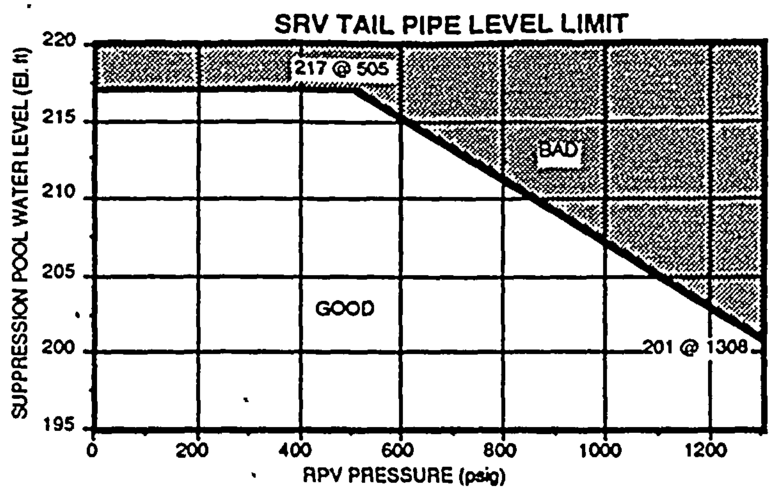

MAXIMUM CORE UNCOVERY TIME LIMIT
CORE UNCOVERY LIMIT (min)
18.29 @ 6000
3.58 @ 22.7
1 hr
5 hr
1 day
TIME AFTER REACTOR SHUTDOWN (min)

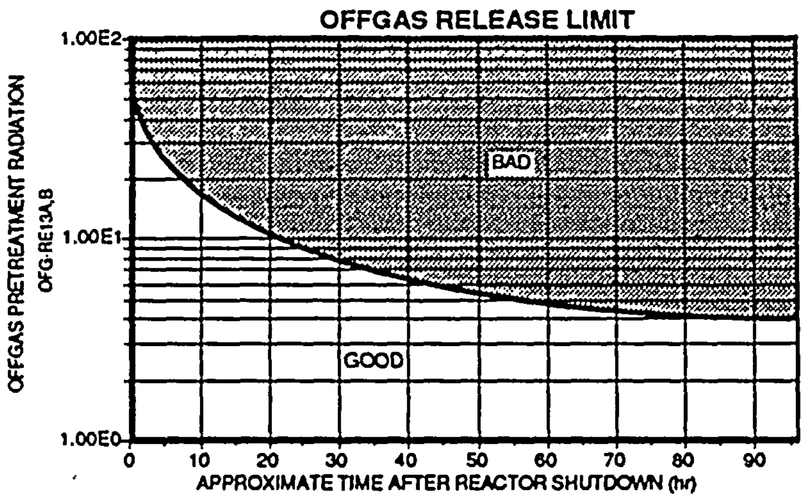

MAX PRIMARY CONTAINMENT WATER LEVEL LIMIT
PRIMARY CONTAINMENT WATER LEVEL (ft.)
82.9 @ 298.25
(RPV LEVEL OF -17 IN.)
GOOD
50.7 @ 224
BAD
SUPPRESSION CHAMBER PRESSURE (psig)

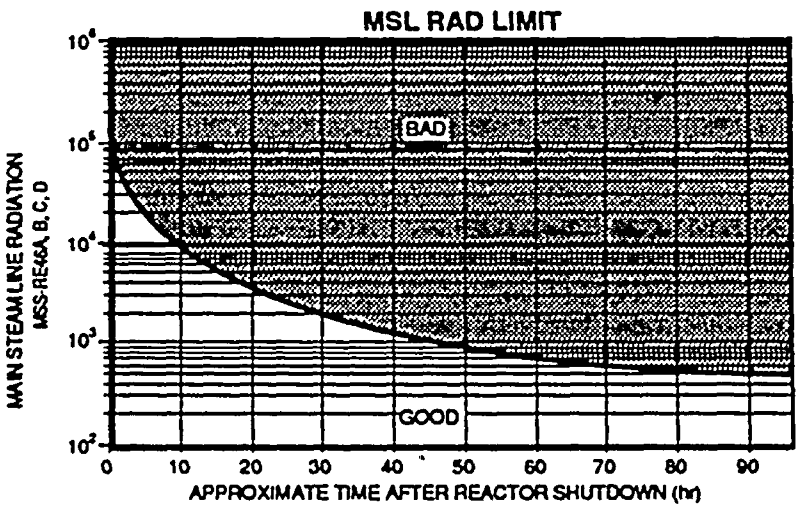

PRIMARY CONTAINMENT PRESSURE LIMIT
SUPPRESSION CHAMBER PRESSURE (psig)
77.2 @ 298.25
BAD
45 @ 176
45 @ 224
GOOD
PRIMARY CONTAINMENT WATER LEVEL (El. ft.)

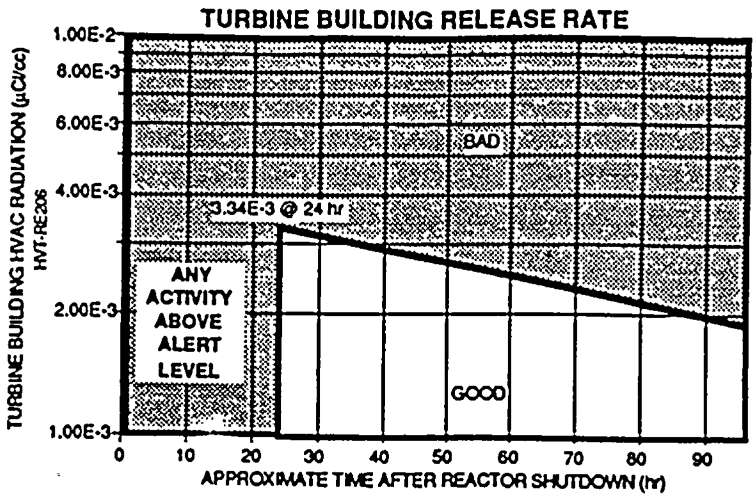

PRESSURE SUPPRESSION PRESSURE
SUPPRESSION CHAMBER PRESSURE (psig)
25 @ 206
BAD
21.2 @ 217
10.2 @ 192
GOOD
SUPPRESSION POOL WATER LEVEL (El. ft)


RPV SATURATION TEMPERATURE
REACTOR BUILDING AREA OR HOTTEST DRYWELL TEMPERATURE (°F)
350 @ 120
BAD
GOOD
212 @ 0
RPV PRESSURE (psig)


SRV TAIL PIPE LEVEL LIMIT
SUPPRESSION POOL WATER LEVEL (El. ft)
220
215
210
205
200
195
217 @ 505
BAD
GOOD
201 @ 1308
0
200
400
600
800
1000
1200
RPV PRESSURE (psig)


OFFGAS RELEASE LIMIT
OFFGAS PRETREATMENT RADIATION
OFG-RE13A,B
1.00E2
1.00E1
1.00E0
BAD
GOOD
0
10
20
30
40
50
60
70
80
90
APPROXIMATE TIME AFTER REACTOR SHUTDOWN (hr)


MSL RAD LIMIT
MAIN STEAM LINE RADIATION
MSS-RE46A, B, C, D
10^6
10^5
10^4
10^3
10^2
BAD
GOOD
0
10
20
30
40
50
60
70
80
90
APPROXIMATE TIME AFTER REACTOR SHUTDOWN (hr)



TURBINE BUILDING RELEASE RATE
TURBINE BUILDING HVAC RADIATION (µCi/cc)
HVT-RE206
1.00E-2
8.00E-3
6.00E-3
4.00E-3
2.00E-3
1.00E-3
BAD
3.34E-3 @ 24 hr
ANY ACTIVITY ABOVE ALERT LEVEL
GOOD
0
10
20
30
40
50
60
70
80
90
APPROXIMATE TIME AFTER REACTOR SHUTDOWN (hr)

<u>NINE MILE POINT</u>
<u>UNIT 2</u>

PLANT SPECIFIC TECHNICAL GUIDELINES

NIAGARA MOHAWK

December 1990

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Appendix A to the PSTG is provided as a comparison document to identify differences between the PSTG and the BWROG EPG. Furthermore, when EOP specific implementation changes have been made (other than format changes), they are also identified in appendix A. Figures and tables are not provided in Appendix A but must be referred to in the BWROG

EPG (rev. 4) and the PSTG Table C respectively. In most cases, the figures and tables in Table C are developed from calculation A10.1-AC-001 Rev. 2.

Where the word "elevation" (or the abbreviation "El.") is used in this PSTG, it refers to NMP2 plant elevation which is measured as height above sea level.

TABLE A

ABBREVIATIONS

ADS	Automatic Depressurization System
APRM	Average Power Range Monitor
ARI	Alternate Rod Insertion
CRD	Control Rod Drive
ECCS	Emergency Core Cooling System
El.	Elevation
HPCI	High Pressure Coolant Injection
HPCS	High Pressure Core Spray
HVAC	Heating, Ventilating and Air Conditioning
HVR	Heating and Ventilating Control Building
IAS	Instrument Air System
IC	Isolation Condenser
LCO	Limiting Condition for Operation
LPCI	Low Pressure Coolant Injection
LPCS	Low Pressure Core Spray
MARFP	Maximum Alternate RPV Flooding Pressure
MPCWLL	Maximum Primary Containment Water Level Limit
MSCRWL	Minimum Steam Cooling RPV Water Level
MSIV	Main Steam Isolation Valve
NPSH	Net Positive Suction Head
NUREG	Nuclear Regulatory Guide
PSP	Pressure Suppression Pressure
RB	Reactor Building
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RPS	Reactor Protection System
RPV	Reactor Pressure Vessel
RRCS	Redundant Reactivity Control System
RSCS	Rod Sequence Control System
RWCU	Reactor Water Cleanup

RWM	Rod Worth Minimizer
SBGT	Standby Gas Treatment
SDC	Shutdown Cooling
SLC	Standby Liquid Control
SLS	Standby Liquid System
SPMS	Suppression Pool Makeup System
SRV	Safety Relief Valve
TAF	Top of Active Fuel

TABLE B

OPERATIONAL LIMITS AND SETPOINTS

•	≤ 200 °F	RPV water temperature for cold shutdown conditions [Tech. Spec. Definition 1.28 and Table 1.2]
•	159.3 in.	low level scram setpoint [Tech. Spec. Table 2.2.1-1 item 4]
•	1037 psig	high RPV pressure scram setpoint [Tech. Spec. Table 2.2.1-1 item 3]
•	1.68 psig	high drywell pressure scram setpoint [Tech. Spec. Table 2.2.1-1 item 7]
•	4 %	APRM downscale trip [Tech. Spec. Table 3.3.6-2 item 2.c]
•	O2	Maximum Subcritical Banked Withdrawal Position [Calculated by the Nuclear Fuels Group in syracuse]
•	202.3 in.	high level trip setpoint [Tech. Spec. Table 3.3.9.2 item 1.a]
•	-14.4 in.	top of active fuel [USAR Fig. 5.2-4 (-14.4 in.), USAR Fig. 5.3-5 and Fig. 1.2-11]
•	1.68 psig	drywell pressure which initiates ECCS [Tech Spec Table 3.3.3.2 items A.1.b and B.1.b]
•	7	number of SRVs dedicated to ADS [USAR 6.3.1.2.4 and Table 6.3-1, USAR Table 1.3-2]
•	960 psig	pressure at which all turbine bypass valves are fully open [NMP2-DFH-88.083]
•	El. 192 ft.	lowest instrumented suppression pool water level [N2-ISP-CMS-R104 Att 1&2, 2CMS*LT9A/B]
•	769 pounds	cold shutdown boron weight [Calc.A10.1-AC-001 Rev. 2]
•	100 °F/hr	RPV cooldown rate LCO [Tech. Spec. 3.4.6.1]
•	0 gal	low SLC tank water level trip 807E161T4 sh. 3,4, and 944E309T4 sh. 26]

- 1500 RPM — minimum pump speed limit per pump vendor manual
  [Bingham Willamente Manual No.VPF 3943-12-6 (NMPC File No. N2-B26500 pump 001]
- 90 °F — most limiting suppression pool temperature LCO
  [Tech. Spec. 3.6.2.1]
- 150 °F — drywell temperature LCO ~~or maximum normal operating temperature, whichever is higher~~
  [Tech. Spec. 3.6.1.6]
- El. 201 ft. — Maximum suppression pool water level LCO
  [Tech. Spec. 3.6.2.1]
- El. 199.5 ft. — minimum suppression pool water level LCO
  [Tech. Spec. 3.6.2.1]
- 1.8% — high hydrogen alarm setpoint
  [N2-ISP-CMS-Q110, Calc. 12177-CS-CMS*07]
- 340 °F — maximum temperature at which ADS is qualified
  [USAR 5.2.2.4.1]
  ~~or drywell design temperature, whichever is lower~~
  [Tech. Spec.5.2.2.b, and USAR Table 6.2-3]
- El. 217 ft. — highest instrumented suppression pool water level
  [N2-ISP-CMS-R104 and R101]
- 10.57 psig — suppression chamber spray initiation pressure
  [Calc. A10.1-AC-001 Rev.1]
- 1 % — minimum detectable hydrogen concentration
  [SPDS 2CMS*ASH6, N2-ISP-CMS-Q110 and M001]
- 0 % — minimum hydrogen concentration for recombiner operation
  [Spec. P282K]
- 5 % — maximum hydrogen concentration for recombiner operation ~~or 6%, whichever is lower~~
- 2.5 % — maximum oxygen concentration for recombiner operation (while hydrogen concentration is 5% or over) ~~or 5%, whichever is lower~~
  [Spec. P282K]

- 5 % — maximum oxygen concentration for recombiner operation (while hydrogen concentration is below 5%) ~~or 5%, whichever is lower~~ [Spec. P282K]
- 17.8 in. — ADS initiation setpoint [Tech. Spec. Table 3.3.3-2 item A.2.a and B.2.a]
- 195 psig — highest RPV pressure at which the shutoff head of a low-water-quality alternate injection subsystem (excluding SLC) is reached [P222W (condensate & 450 ft. head)]
- 4 — Minimum Number of SRVs Required for Emergency Depressurization [Calc A10.1-AC-001 Rev. 2 (page 101)]
- -58.2 in. — Minimum Zero Injection RPV Water Level [Calc A10.1-AC-001 Rev. 2 (page 101)]
- 1 — minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure [Calc A10.1-AC-001 Rev. 2 (page 101)]
- 61 psig — Minimum RPV Flooding Pressure [Calc A10.1-AC-001 Rev. 2 (page 101)]
- -45.6 in. — Minimum Steam Cooling RPV Water Level [Calc A10.1-AC-001 Rev. 2 (page 101)]
- 248 ft. 6 in. — elevation of the bottom of the lowest recirculation piping [Dwg. EP-70]
- 298 ft. 6 in. — elevation of top of active fuel [RPV invert: El.267' 11.875" (USAR Fig. 1.2-11, TAF= 366.31" above RPV invert (USAR Fig. 5.3-5) ie: 298' 6"]
- 10 R/hr. — Maximum safe operating radiation level for the secondary containment [Maximum scale readings for RB ARMs]
- 135 °F — Maximum safe operating temperature for the secondary containment (personnel access)
- 212°F — Maximum safe operating temperature for the secondary containment (EQ) [BWR equipment environmental interface data GE Doc. No. 22A3008 Rev. 5 Section 4.5.1.1]

- 0 psig — Minimum SRV Reopening Pressure
  [FSAR Table 15.03, EPG rev. 4, Appendix C Section 2]
- El. 292.5 ft. — (elevation of containment vent minus adjustment for instrument accuracy)
  [Dwg. EV-1N, EP-121C, PID-61A, USAR Figure 5.3.5, USAR Figure 1.2-11]
- El. 296.5 ft. — (minimum level for Primary Containment flooding)
  [Calc A10.1-AC-001 Rev. 2 (page 101)]
- El. 298.5 ft. — Minimum Steam Cooling RPV Water Level
  [Calc A10.1-AC-001 Rev. 2 (page 101)]

TABLE C
OPERATIONAL LIMITS - FIGURES

BORON INJECTION INITIATION TEMPERATURE

HPCS PUMP NPSH LIMIT

LPCS PUMP NPSH LIMIT

RHR PUMPS NPSH LIMIT

HPCS PUMP VORTEX LIMIT

LPCS PUMP VORTEX LIMIT

RHR PUMP VORTEX LIMIT

DRYWELL SPRAY INITIATION PRESSURE LIMIT

HEAT CAPACITY LEVEL LIMIT

HEAT CAPACITY TEMPERATURE LIMIT

MAXIMUM CORE UNCOVERY TIME LIMIT

MAX. PRIMARY CONTAINMENT WATER LEVEL LIMIT

PRIMARY CONTAINMENT PRESSURE LIMIT

PRESSURE SUPPRESSION PRESSURE

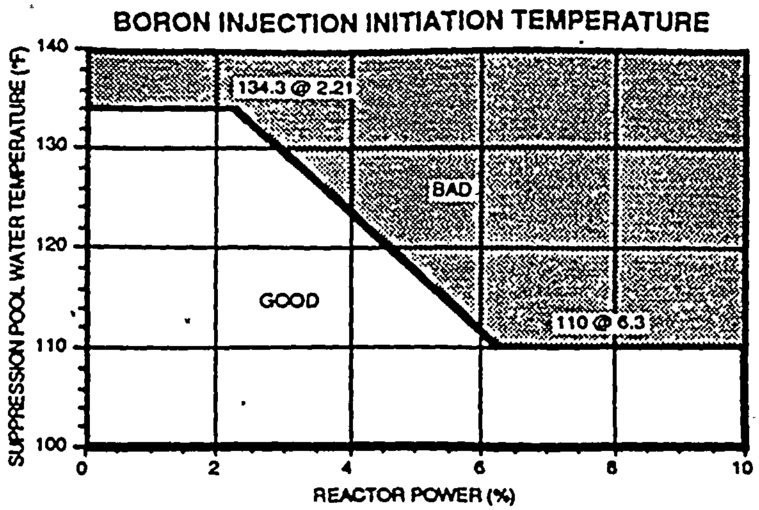
RPV SATURATION TEMPERATURE

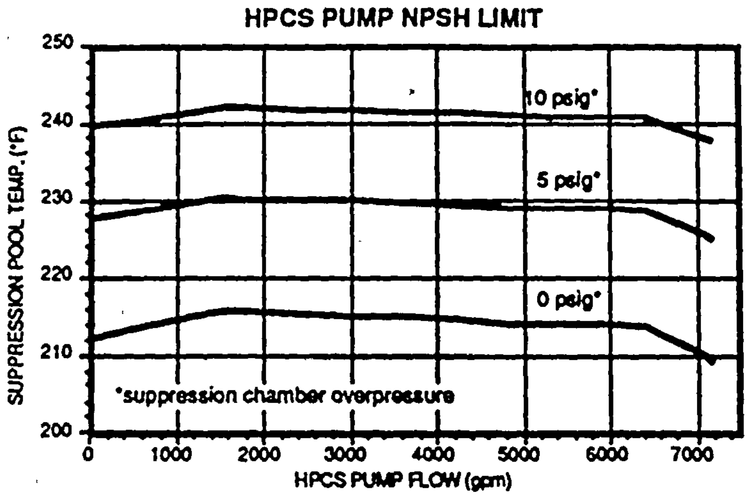
SRV TAILPIPE LEVEL LIMIT

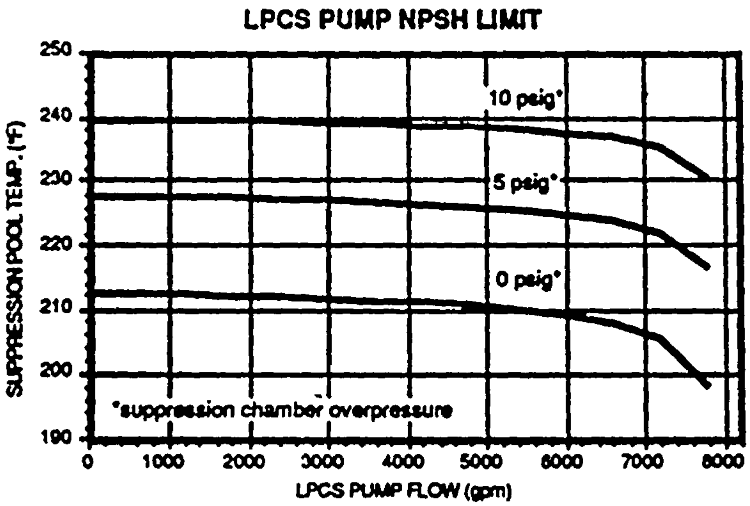
OFFGAS RELEASE RATE

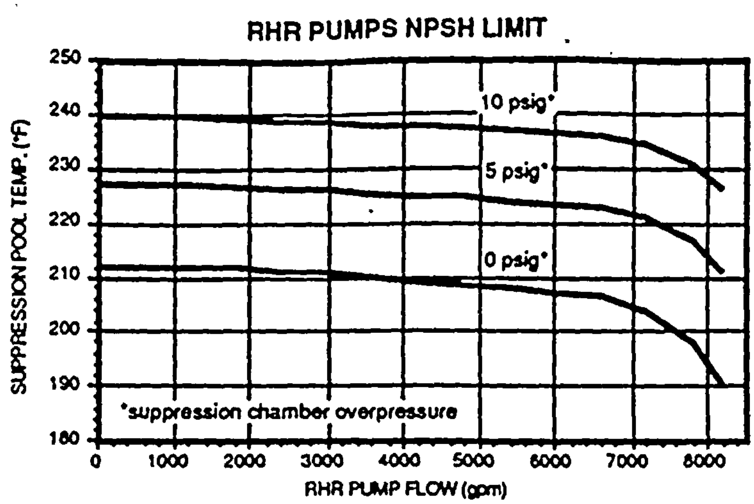
MSL RAD LIMIT

TURBINE BUILDING RELEASE RATE

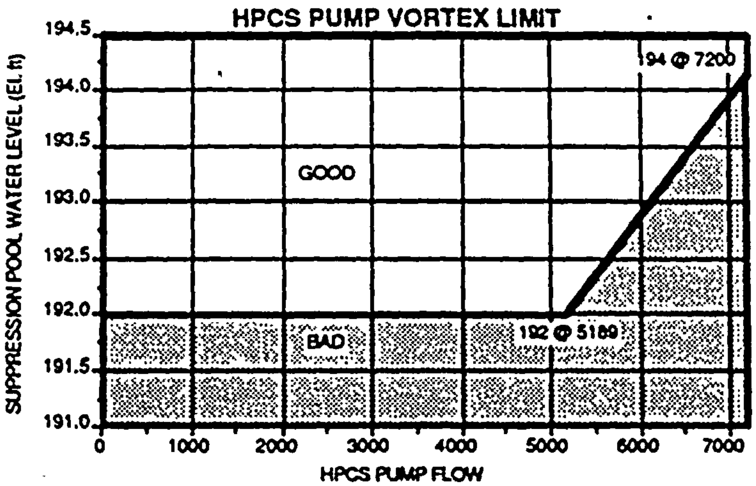

BORON INJECTION INITIATION TEMPERATURE
SUPPRESSION POOL WATER TEMPERATURE (°F)
REACTOR POWER (%)
134.3 @ 2.21
BAD
GOOD
110 @ 6.3


HPCS PUMP NPSH LIMIT
SUPPRESSION POOL TEMP. (°F)
HPCS PUMP FLOW (gpm)
10 psig*
5 psig*
0 psig*
*suppression chamber overpressure

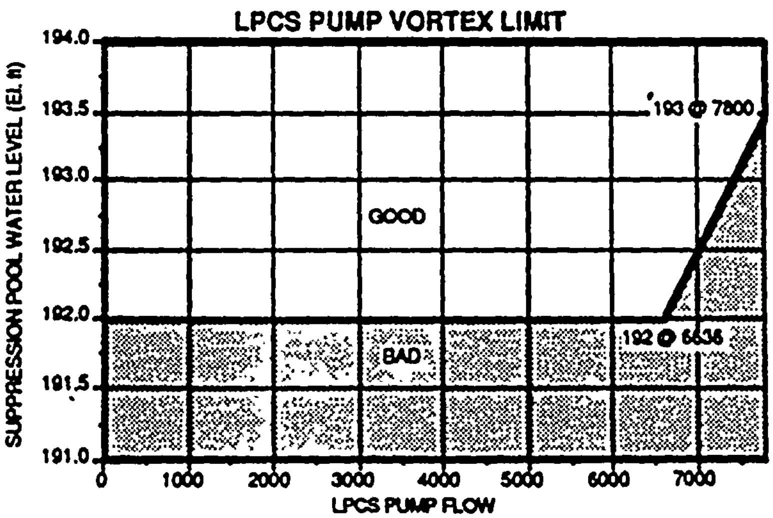

LPCS PUMP NPSH LIMIT
SUPPRESSION POOL TEMP. (°F)
LPCS PUMP FLOW (gpm)
10 psig*
5 psig*
0 psig*
*suppression chamber overpressure



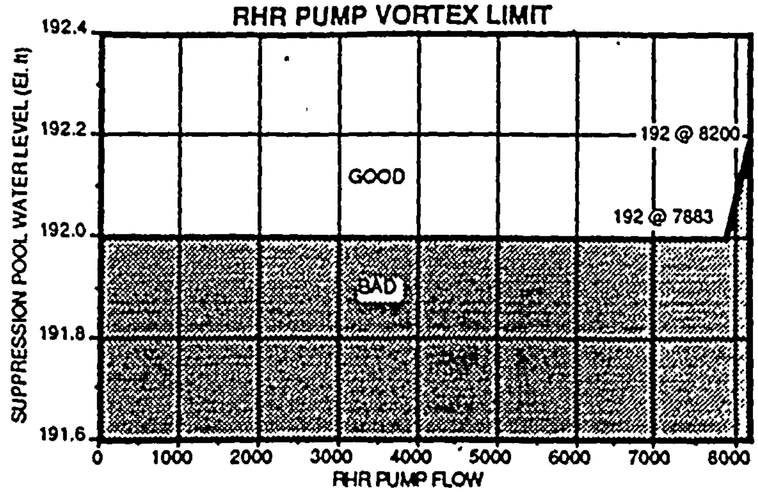
RHR PUMPS NPSH LIMIT
SUPPRESSION POOL TEMP. (°F)
10 psig*
5 psig*
0 psig*
*suppression chamber overpressure
RHR PUMP FLOW (gpm)

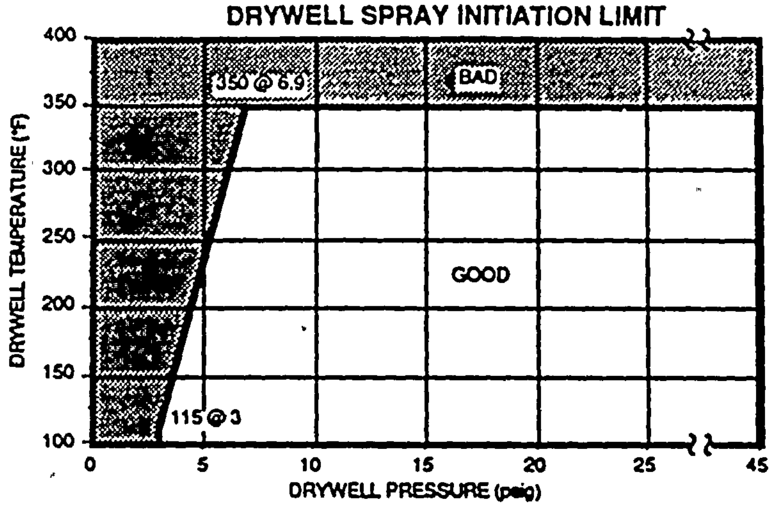


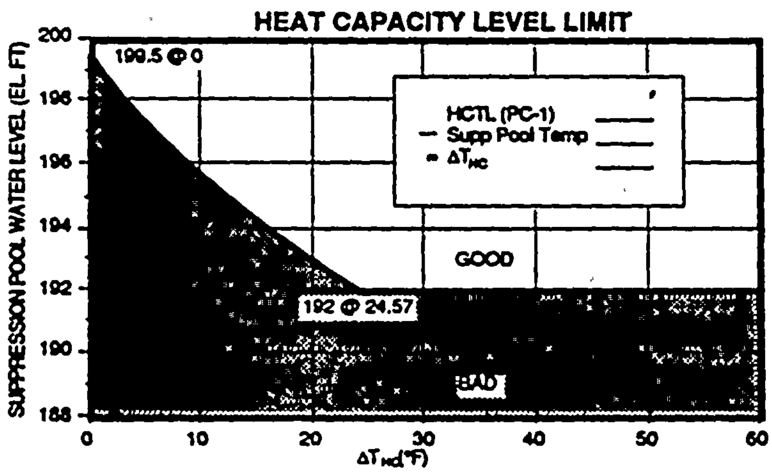
HPCS PUMP VORTEX LIMIT
SUPPRESSION POOL WATER LEVEL (El. ft)
194 @ 7200
GOOD
BAD
192 @ 5189
HPCS PUMP FLOW



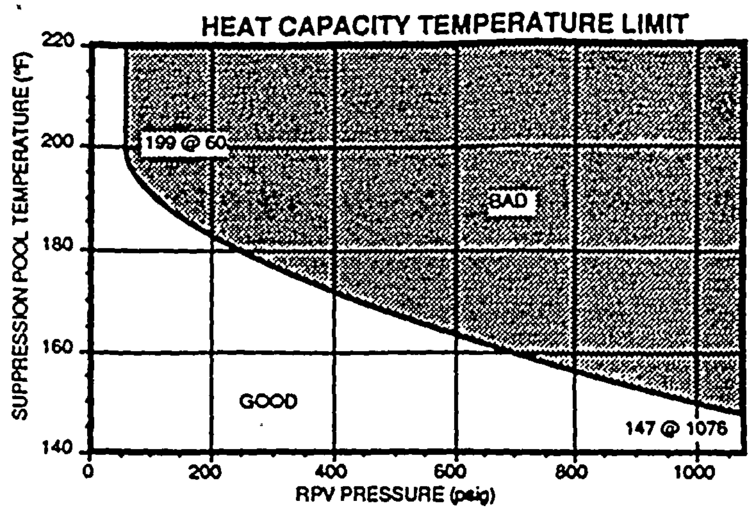
LPCS PUMP VORTEX LIMIT
SUPPRESSION POOL WATER LEVEL (El. ft)
193 @ 7800
GOOD
BAD
LPCS PUMP FLOW

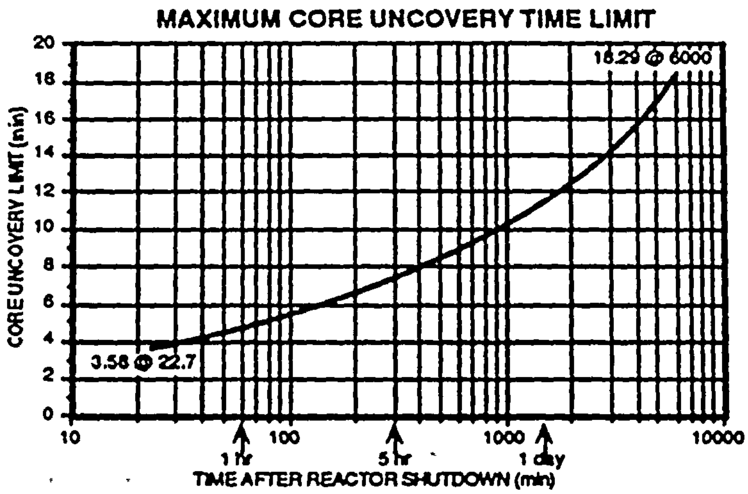


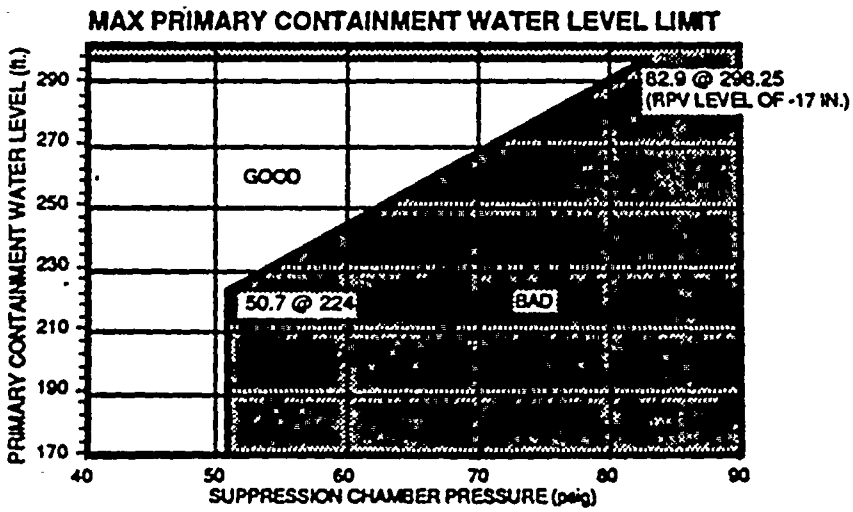


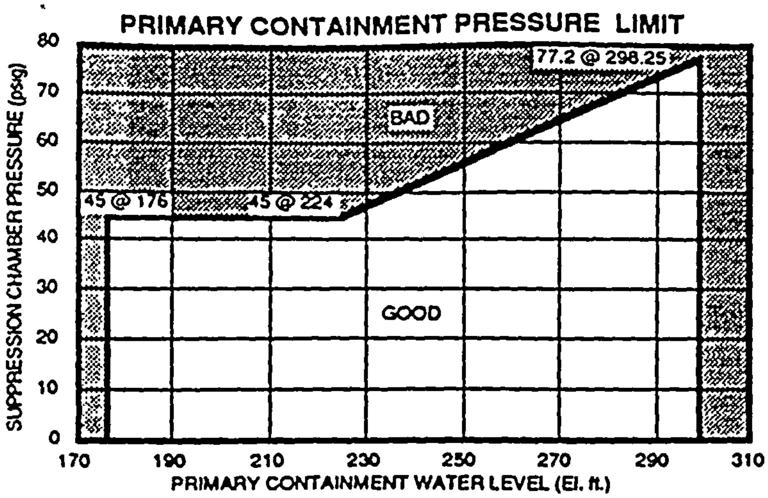


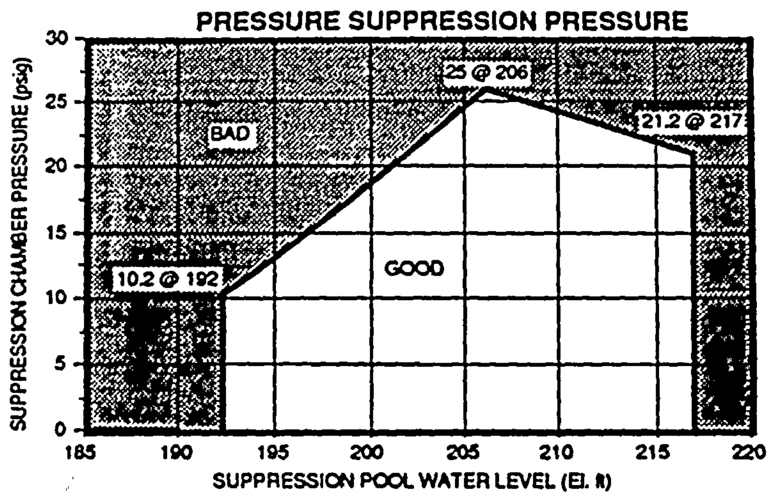
where ΔT_{HC} = (Heat Capacity Temp Limit) - (Suppression Pool Temp)
PC-1

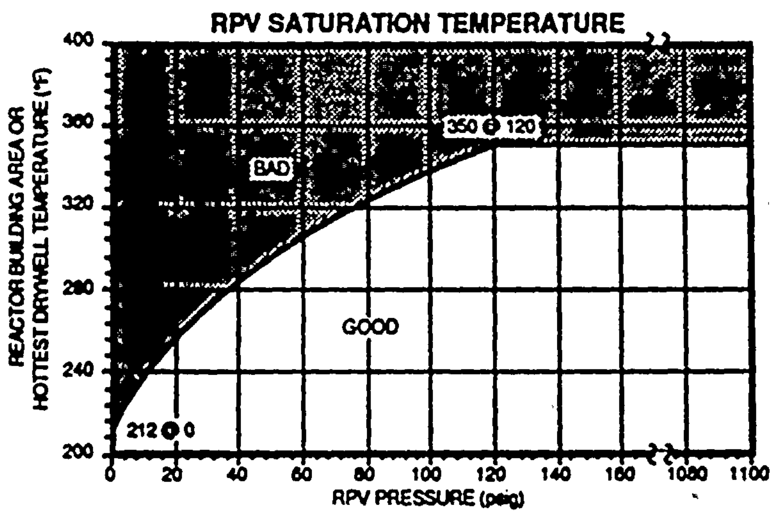

HEAT CAPACITY TEMPERATURE LIMIT
SUPPRESSION POOL TEMPERATURE (°F)
RPV PRESSURE (psig)
199 @ 60
BAD
GOOD
147 @ 1076


MAXIMUM CORE UNCOVERY TIME LIMIT
CORE UNCOVERY LIMIT (min)
TIME AFTER REACTOR SHUTDOWN (min)
18.29 @ 6000
3.58 @ 22.7
1 hr
5 hr
1 day

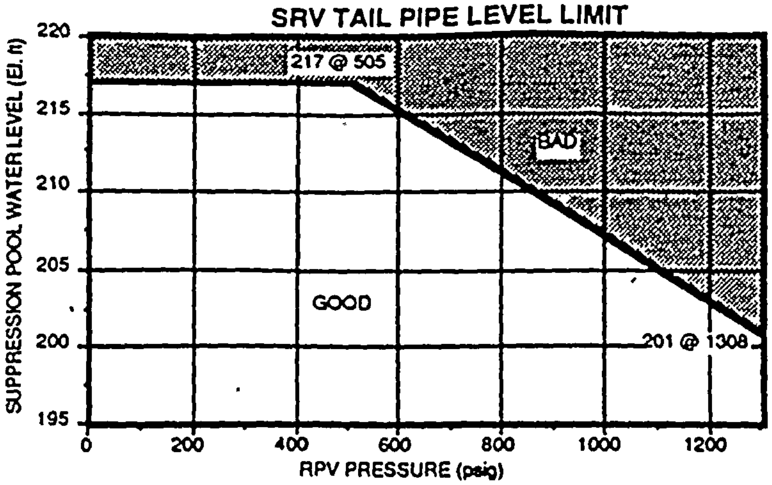

MAX PRIMARY CONTAINMENT WATER LEVEL LIMIT
PRIMARY CONTAINMENT WATER LEVEL (ft.)
SUPPRESSION CHAMBER PRESSURE (psig)
82.9 @ 298.25
(RPV LEVEL OF -17 IN.)
GOOD
BAD
50.7 @ 224


PRIMARY CONTAINMENT PRESSURE LIMIT
SUPPRESSION CHAMBER PRESSURE (psig)
80
70
60
50
40
30
20
10
0
77.2 @ 298.25
BAD
45 @ 176
45 @ 224
GOOD
170
190
210
230
250
270
290
310
PRIMARY CONTAINMENT WATER LEVEL (El. ft.)

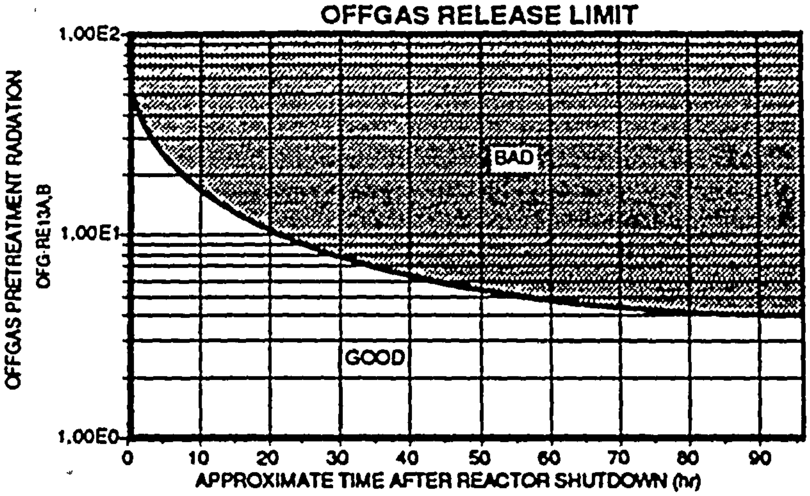

PRESSURE SUPPRESSION PRESSURE
SUPPRESSION CHAMBER PRESSURE (psig)
30
25
20
15
10
5
0
25 @ 206
21.2 @ 217
BAD
GOOD
10.2 @ 192
185
190
195
200
205
210
215
220
SUPPRESSION POOL WATER LEVEL (El. ft)


RPV SATURATION TEMPERATURE
REACTOR BUILDING AREA OR
HOTTEST DRYWELL TEMPERATURE (°F)
400
360
320
280
240
200
350 @ 120
BAD
GOOD
212 @ 0
0
20
40
60
80
100
120
140
160
1080
1100
RPV PRESSURE (psig)

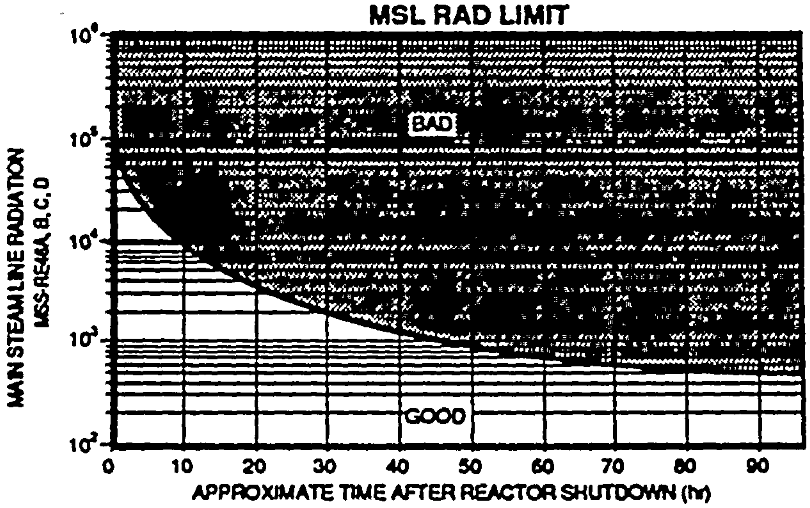
SRV TAIL PIPE LEVEL LIMIT

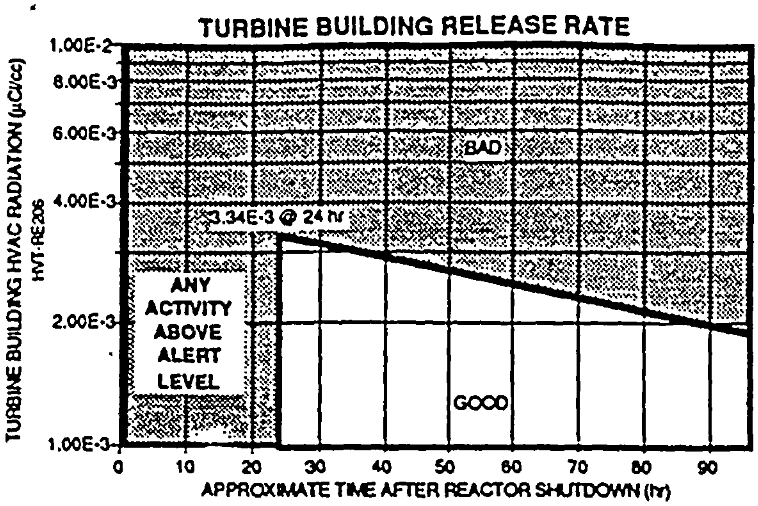


OFFGAS RELEASE LIMIT



MSL RAD LIMIT



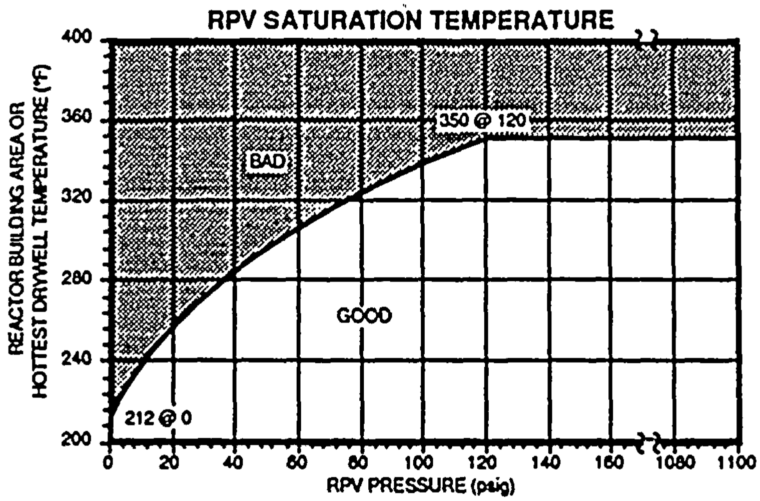

TURBINE BUILDING RELEASE RATE
TURBINE BUILDING HVAC RADIATION (µCi/cc)
HVT-RE206
1.00E-2
8.00E-3
6.00E-3
4.00E-3
2.00E-3
1.00E-3
BAD
3.34E-3 @ 24 hr
ANY ACTIVITY ABOVE ALERT LEVEL
GOOD
0
10
20
30
40
50
60
70
80
90
APPROXIMATE TIME AFTER REACTOR SHUTDOWN (hr)

CAUTIONS

CAUTION #1

An RPV water level instrument may be used to determine RPV water level only when all the following conditions are satisfied for that instrument:

- The hottest drywell temperature is below the RPV Saturation Temperature and RB temperature near instrument legs are below the RPV Saturation Temperature.



- For each of the instruments in the following table, the instrument reads above the Minimum Indicated Level:

	Hottest Drywell Temperature	
Instrument	Below 350°F	350°F or above
Shutdown range	194.7 in.	250.3 in.
Upset range	188.8 in.	260.7 in.
Wide Range	20.5 in.	20.4 in.
Narrow Range	149.1 in.	151.8 in.
Fuel Zone	-155.2 in.	-159.4 in.

CAUTION #3

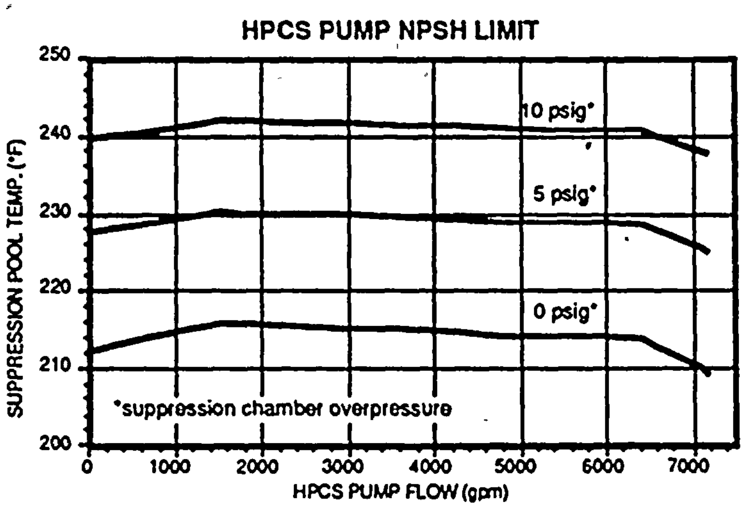
OPERATING RCIC turbine below 1500 RPM *(minimum turbine speed limit per turbine vendor manual)* may result in unstable system operation and equipment damage.

CAUTION #4

Elevated suppression chamber pressure may trip the RCIC turbine on high exhaust pressure.

CAUTION #5

If HPCS is taking suction from the suppression pool and suppression pool temperature exceeds the HPCS pump NPSH Limit, the pump may be damaged and become inoperable.



CAUTION #6

Cooldown rates above 100°F/hr *(RPV cooldown rate LCO)* may be required to accomplish this step.

CAUTION #7

Raising injection flow rapidly may induce a large power excursion and result in substantial core damage.

RPV
CONTROL

PURPOSE

The purpose of this guideline is to:

- Maintain adequate core cooling,
- Shut down the reactor, and
- Cool down the RPV to cold shutdown conditions (RPV water temperature ≤ 200°F *(cold shutdown conditions)*).

ENTRY CONDITIONS

The entry conditions for this guideline are any of the following:

- RPV water level below 159.3 in. *(low level scram setpoint)*
- RPV pressure above 1037 psig *(high RPV pressure scram setpoint)*
- Drywell pressure above 1.68 psig *(high drywell pressure scram setpoint)*
- A condition which requires reactor scram, and reactor power above 4%*(APRM downscale trip)* or cannot be determined

OPERATOR ACTIONS

RC-1 If reactor scram has not been initiated, initiate reactor scram.

> Irrespective of the entry conditions, execute Steps RC/L, RC/P, and RC/Q concurrently.

RC/L Monitor and control RPV water level.

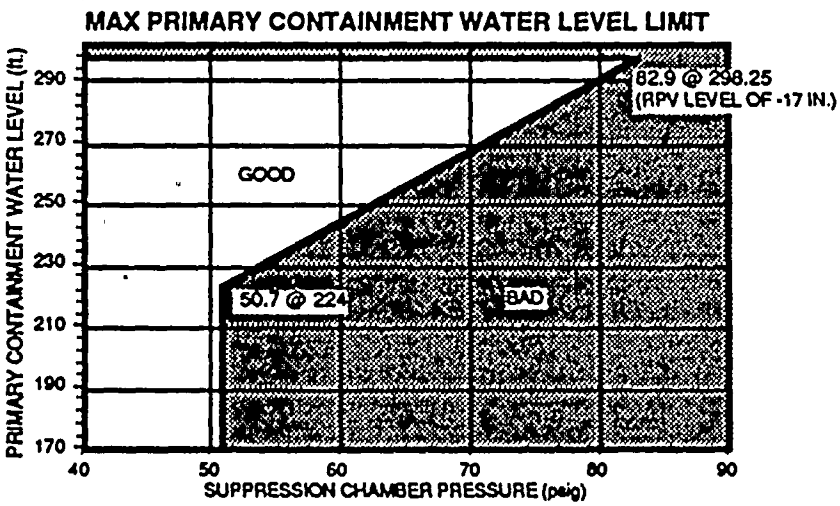
RC/L-1 Initiate each of the following which should have initiated but did not:

- Isolation
- ECCS
- Emergency Diesel Generators

If while executing the following step:

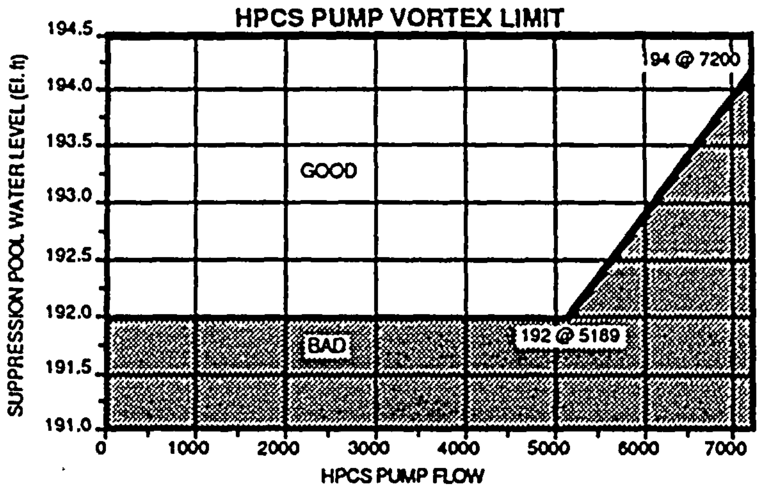
- Any control rod cannot be determined to be inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* and it has not been determined that the reactor will remain shutdown under all conditions without boron, enter Contingency #5.
- RPV water level cannot be determined, enter Contingency #4.

If while executing the following step primary containment water level and suppression chamber pressure cannot be maintained below the Maximum Primary Containment Water Level Limit, then irrespective of whether adequate core cooling is assured terminate injection into the Primary Containment from sources external to the primary containment until primary containment water level and suppression chamber pressure can be maintained below the Maximum Primary Containment Water Level Limit.

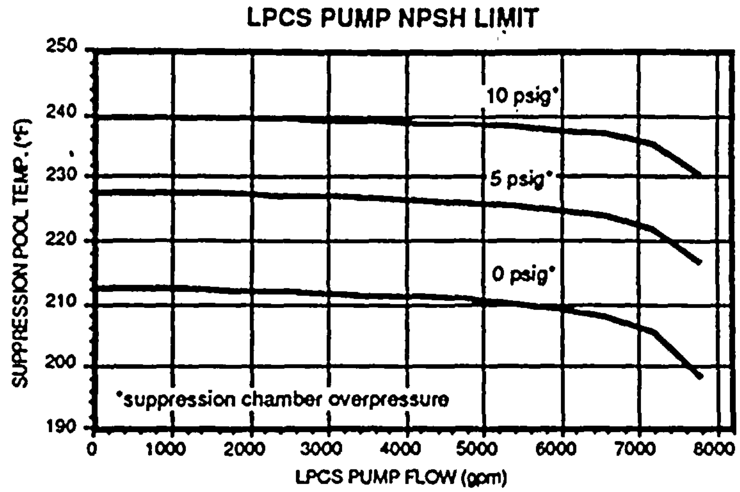


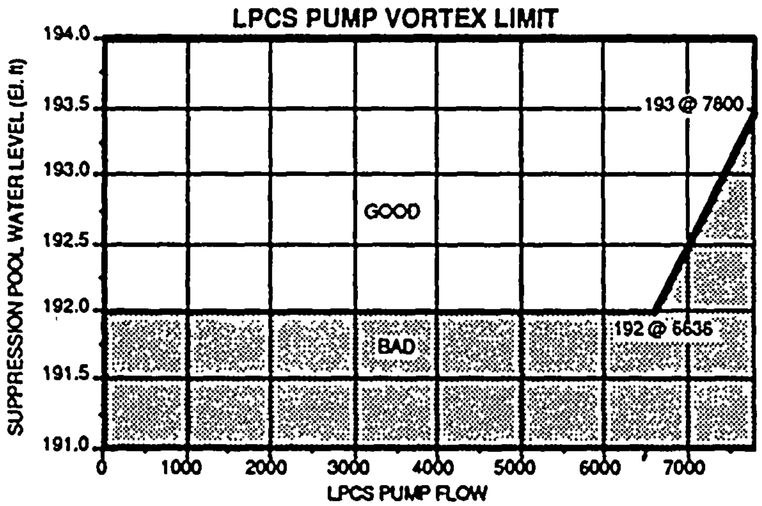
RC/L-2 Restore and maintain RPV water level between 159.3 in. *(low level scram setpoint / shutdown cooling RPV water level interlock)* and 202.3 in. *(high level trip setpoint)* with one or more of the following systems:

- Condensate/Feedwater
- CRD
- RCIC with suction from the condensate storage tank, if available defeating low RPV pressure isolation interlocks if necessary. 3 4
- HPCS; control and maintain pump flow less than the HPCS Vortex Limit. 5

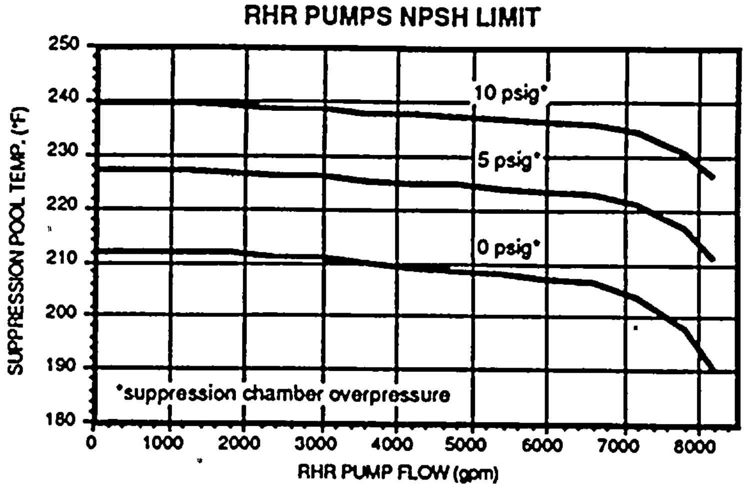


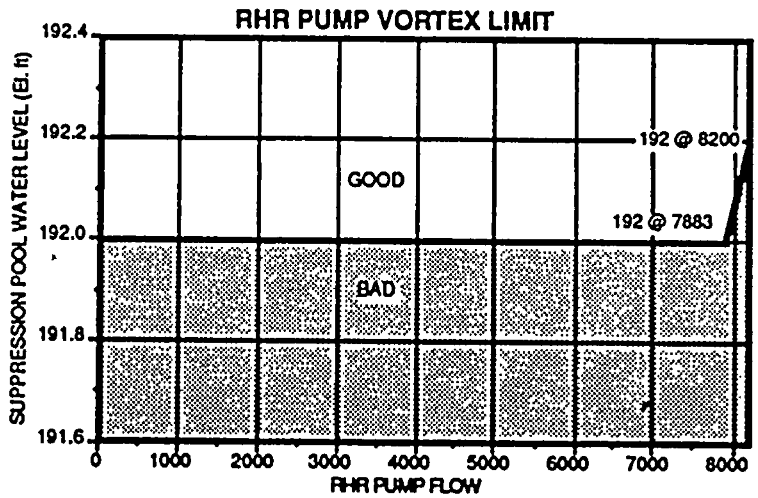
- LPCS; control and maintain pump flow less than the LPCS Pump NPSH Limit and the LPCS Vortex Limit.





- LPCI with injection through the heat exchangers as soon as possible; control and maintain pump flow less than the RHR Pump NPSH Limit and the RHR Vortex Limit.





If RPV water level cannot be restored and maintained above 159.3 in. *(low level scram setpoint / shutdown cooling RPV water level interlock)*, maintain RPV water level above -14.4 in. *(top of active fuel).*

RPV water level control may be augmented by one or more of the following systems:

- RHR service water crosstie
- Fire system
- ECCS keep-full systems
- SLC (test tank)
- SLC (boron tank)
- Condensate Transfer

If RPV water level can be maintained above -14.4 in. *(top of active fuel)* and the ADS timer has initiated, place the ADS logic inhibit switches in ON.

> If RPV water level cannot be maintained above -14.4 in. *(top of active fuel)*, enter Contingency #1.

procedure for cooldown to cold shutdown conditions

RC/L-3 When ~~OP-101C~~ is entered from RC/P-5, proceed to cold shutdown in accordance with ~~OP-101C.~~

RC/P Monitor and control RPV pressure.

If while executing the following steps:

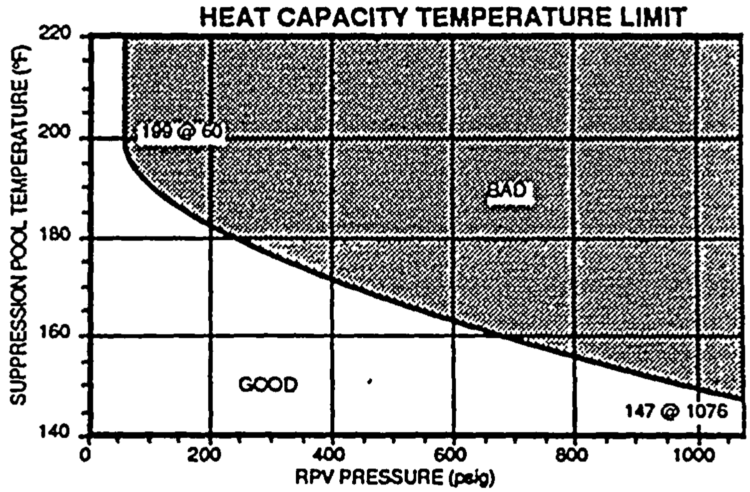
- A high drywell pressure ECCS initiation signal (1.68 psig) *(drywell pressure which initiates ECCS)* exists, prevent injection from those LPCS and LPCI pumps not required to assure adequate core cooling prior to depressurizing below their maximum injection pressures.
- Emergency RPV depressurization is anticipated and either all control rods are inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* or it has been determined that the reactor will remain shutdown under all conditions without boron, rapidly depressurize the RPV with the main turbine bypass valves.
- Emergency RPV depressurization is required and less than 7 *(number of SRVs dedicated to ADS)* SRVs are open, enter Contingency #2.
- RPV water level cannot be determined and less than 7 *(number of SRVs dedicated to ADS)* SRVs are open, enter Contingency #2.
- RPV water level cannot be determined and at least 7 *(number of SRVs dedicated to ADS)* SRVs are open, enter Contingency #4.

6

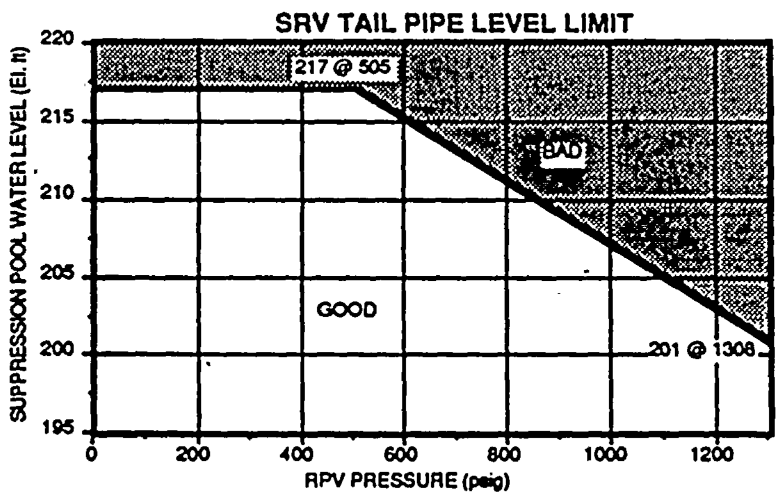
RC/P-1 If any SRV is cycling, manually open SRVs until RPV pressure drops to 960 psig *(RPV pressure at which all turbine bypass valves are fully open)*.

If while executing the following steps:

- Suppression pool temperature cannot be maintained below the Heat Capacity Temperature Limit, maintain RPV pressure below the limit. ⑥



- Suppression pool water level cannot be maintained below the SRV Tail Pipe Level Limit, maintain RPV pressure below the limit. ⑥



- Steam Cooling is required, enter Contingency #3.

If while executing the following steps:

- Boron injection is required, and
- The main condenser is available, and
- There has been no indication of gross fuel failure or steam line break,

open MSIVs, bypassing IAS and low RPV water level MSIV isolation interlocks if necessary, to re-establish the main condenser as a heat sink.

RC/P-2 Stabilize RPV pressure at a pressure below 1037 psig *(high RPV pressure scram setpoint)* with the main turbine bypass valve.

RPV pressure control may be augmented by one or more of the following systems:

- SRVs only when suppression pool water level is above El. 192 ft *(lowest instrumented suppression pool water level)*; open SRVs in the following sequence, if possible: PSV-128, 133, 123, 124, 136, 131, 122, 120, 132, 125, 121, 135, 126, 130, 127, 129, 137, 134 (SRV opening sequence), defeat pneumatic system interlocks if necessary; if the continuous SRV pneumatic supply is or becomes unavailable, place the control switch for each SRV in the AUTO position.
- RCIC with suction from the condensate storage tank if available. 3 4
- RHR in the steam condensing mode.
- RWCU (recirculation mode), bypassing filter/demineralizers and, if necessary, defeating SLC and other isolation interlocks.
- Main steam line drains.
- RWCU (blowdown mode) if no boron has been injected into the RPV. Refer to sampling procedures prior to initiating blowdown.

If while executing the following steps the reactor is not shutdown, return to Step RC/P-2

RC/P-3 When either:

- All control rods are inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)*, or
- It has been determined that the reactor will remain shutdown under all conditions without boron, or
- 769 pounds *(cold shutdown boron weight)* of boron have been injected into the RPV, or
- The reactor is shutdown and no boron has been injected into the RPV,

depressurize the RPV and maintain cooldown rate below 100°F/hr *(RPV cooldown rate LCO)*.

If one or more SRVs are being used to depressurize the RPV and the continuous SRV pneumatic supply is or becomes unavailable, depressurize with sustained SRV opening.

RC/P-4 When the shutdown cooling RPV pressure interlock clears, and either all control rods are inserted to or beyond position 02, or it has been determined that the reactor will remain shutdown under all conditions without boron, initiate shutdown cooling using only those RHR pumps not required to maintain RPV water level above 159.3 in. *(RPV water level shutdown cooling interlock)* by operation in the LPCI mode.

If shutdown cooling cannot be established and further cooldown is required, continue to cool down using one or more of the systems used for depressurization.

RC/P-5 Proceed to cold shutdown in accordance with ~~OP-101C.~~ procedure for cooldown to cold shutdown conditions

RC/Q Monitor and control reactor power.

If while executing the following steps:

- All control rods are inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)*, terminate boron injection and enter ~~OP-101C, Section H.1.~~ scram procedure.
- It has been determined that the reactor will remain shutdown under all conditions without boron, terminate boron injection and enter ~~OP-101C, Section H.1.~~ scram procedure.
- The reactor is shutdown and no boron has been injected into the RPV, enter ~~OP-101C, Section H.1.~~ scram procedure,

RC/Q-1 Confirm or place the reactor mode switch in SHUTDOWN.

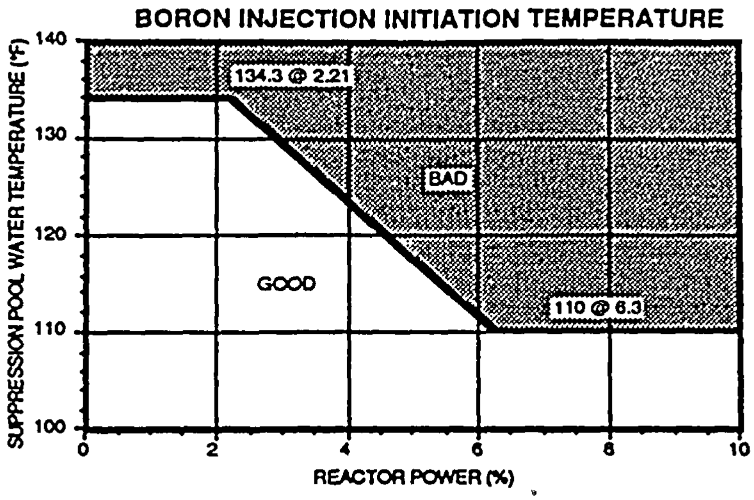
RC/Q-2 If ARI has not initiated, initiate RRCS.

RC/Q-3 If the main turbine-generator is on-line and the MSIVs are open, confirm or initiate recirculation flow runback to minimum.

RC/Q-4 If reactor power is above 4% *(APRM downscale trip)* or cannot be determined, trip the recirculation pumps.

Execute Steps RC/Q-5 and RC/Q-6 concurrently.

RC/Q-5 Before suppression pool temperature reaches the Boron Injection Initiation Temperature but only if the reactor cannot be shut down, BORON INJECTION IS REQUIRED; inject boron into the RPV with SLC and place the ADS logic inhibit switches in ON.



If boron cannot be injected with SLC, inject boron into the RPV using one or more of the following alternate methods:

- Hydro pump
- RWCU

If while executing the following steps SLC tank water level drops to 0 gallons *(low SLC tank water level trip)*, confirm automatic trip of or manually trip the SLC pumps.

RC/Q-5.1 If boron is not being injected into the RPV by RWCU and RWCU is not isolated, bypass filter/demineralizers.

RC/Q-5.2 When all control rods are inserted to or beyond position 02, or it has been determined that the reactor will remain shutdown under all conditions without boron, enter OP-~~101C, Section H.1.~~ Scram. procedure.

RC/Q-6 Insert control rods as follows:

RC/Q-6.1 Reset ARI, defeating ARI logic trips if necessary.

RC/Q-6.2 Insert control rods with one or more of the following methods:

- De-energize scram solenoids
- Vent the scram air header
- Reset the scram, defeating RPS logic trips if necessary, drain the scram discharge volume, and initiate a manual scram
- Open individual scram test switches
- Drive control rods, defeating RSCS and RWM interlocks if necessary
- Vent control rod drive overpiston volumes

PRIMARY CONTAINMENT CONTROL

PURPOSE

The purpose of this guideline is to:

- Maintain primary containment integrity, and
- Protect equipment in the primary containment.

ENTRY CONDITIONS

The entry conditions for this guideline are any of the following:

- Suppression pool temperature above 90°F *(most limiting suppression pool temperature LCO)*
- Drywell temperature above 150°F *(drywell temperature LCO or maximum normal operating temperature, whichever is higher)*
- Drywell pressure above 1.68 psig *(high drywell pressure scram setpoint)*
- Suppression pool water level above El. 201 ft *(Maximum suppression pool water level LCO)*
- Suppression pool water level below El. 199.5 ft *(minimum suppression pool water level LCO)*
- Primary containment hydrogen concentration above 1.8% *(high hydrogen alarm setpoint)*

OPERATOR ACTIONS

> Irrespective of the entry conditions, execute Steps SP/T, DW/T, PC/P, SP/L, and PC/H concurrently.

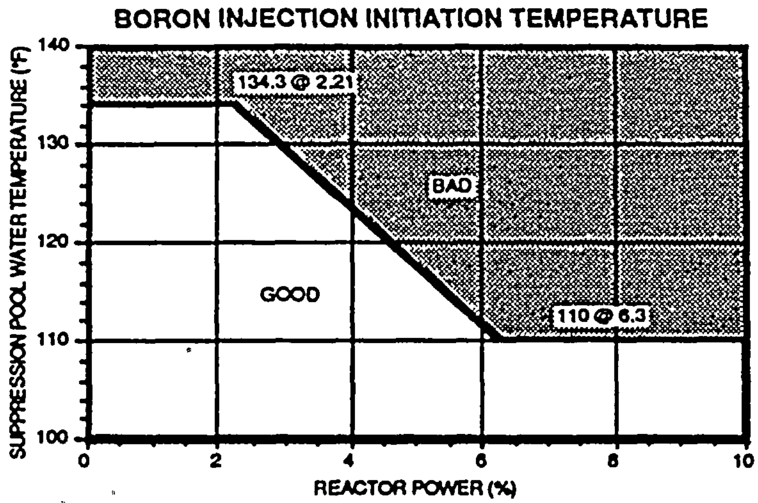
SP/T Monitor and control suppression pool temperature below 90°F (most limiting suppression pool temperature LCO) using available suppression pool cooling.

When suppression pool temperature cannot be maintained below 90°F (most

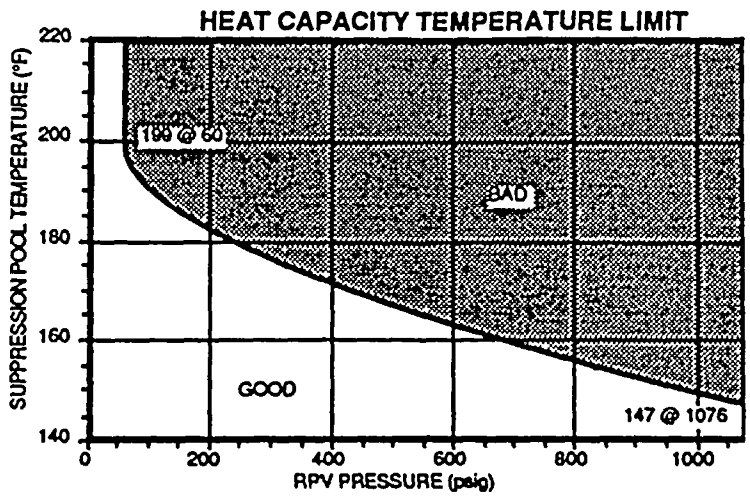
limiting suppression pool temperature LCO) :

SP/T-1 Operate all available suppression pool cooling using only those RHR pumps not required to assure adequate core cooling by continuous operation in the LPCI mode.

SP/T-2 Before suppression pool temperature reaches the Boron Injection Initiation Temperature, enter RPV Control at step RC-1 and execute it concurrently with this procedure.



SP/T-3 When suppression pool temperature and RPV pressure cannot be maintained below the Heat Capacity Temperature Limit, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.



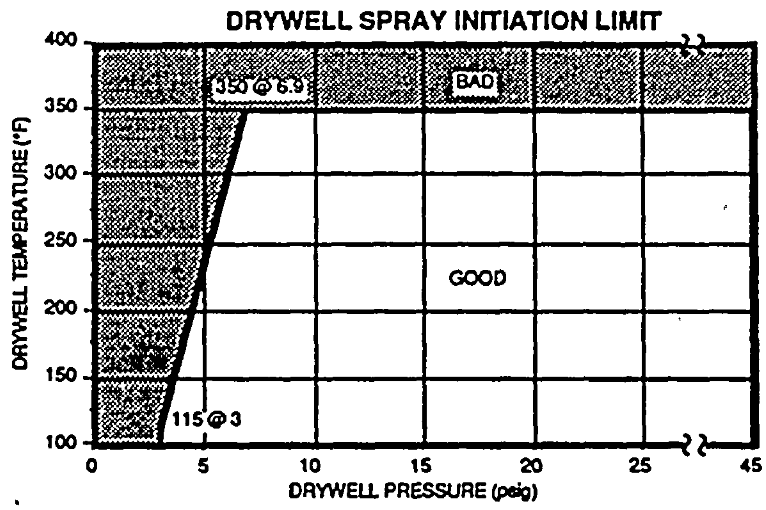
DW/T Monitor and control drywell temperature below 150°F *(drywell temperature LCO)* using available drywell cooling.

When drywell temperature cannot be maintained below 150°F *(drywell temperature LCO)*: 11

DW/T-1 Operate all available drywell cooling, defeating isolation interlocks if necessary.

> If while executing the following steps drywell sprays have been initiated and drywell pressure drops below 1.68 psig *(high drywell pressure scram setpoint)*, terminate drywell sprays.

DW/T-2 Before drywell temperature reaches 340°F *(maximum temperature at which ADS is qualified, ~~or drywell design temperature, whichever is lower~~)* but only if suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)* and drywell temperature and pressure are within the Drywell Spray Initiation Limits, shut down recirculation pumps and drywell cooling fans and initiate drywell sprays, using only those pumps not required to assure adequate core cooling by continuous injection.



DW/T-3 When drywell temperature cannot be maintained below 340°F *(maximum temperature at which ADS is qualified, ~~or drywell design temperature, whichever is lower~~)*, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter RPV Control at step RC-1 and execute it concurrently with this procedure.

PC/P Monitor and control primary containment pressure below 1.68 psig *(high drywell scram setpoint)* using SBGT. Use SBGT operating procedures.

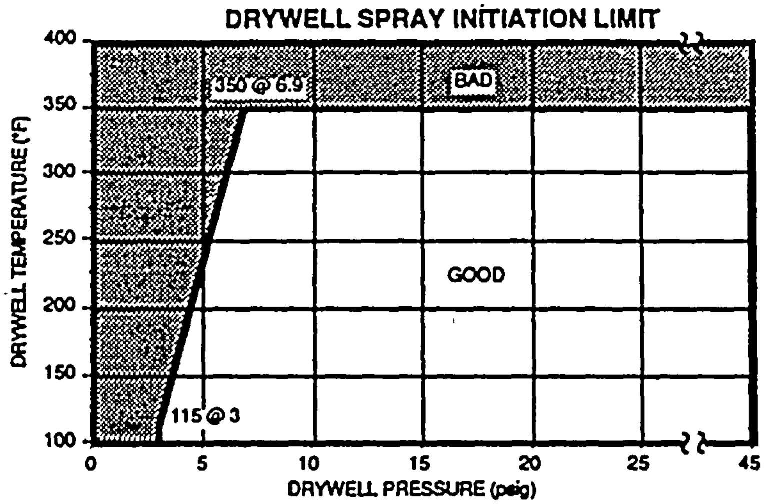
When primary containment pressure cannot be maintained below 1.68 psig *(high drywell pressure scram setpoint)*:

> If while executing the following steps suppression pool sprays have been initiated and suppression chamber pressure drops below 1.68 psig *(high drywell pressure scram setpoint)*, terminate suppression pool sprays.

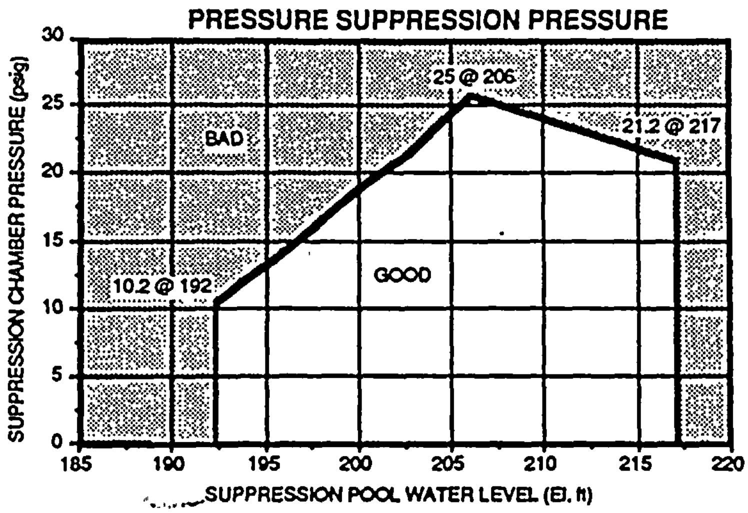
PC/P-1 Before suppression chamber pressure reaches 10.57 psig*(suppression chamber spray initiation pressure)*, but only if suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)* initiate suppression pool sprays using only those pumps not required to assure adequate core cooling by continuous injection.

> If while executing the following steps drywell sprays have been initiated and drywell pressure drops below 1.68 psig *(high drywell pressure scram setpoint)*, terminate drywell sprays.

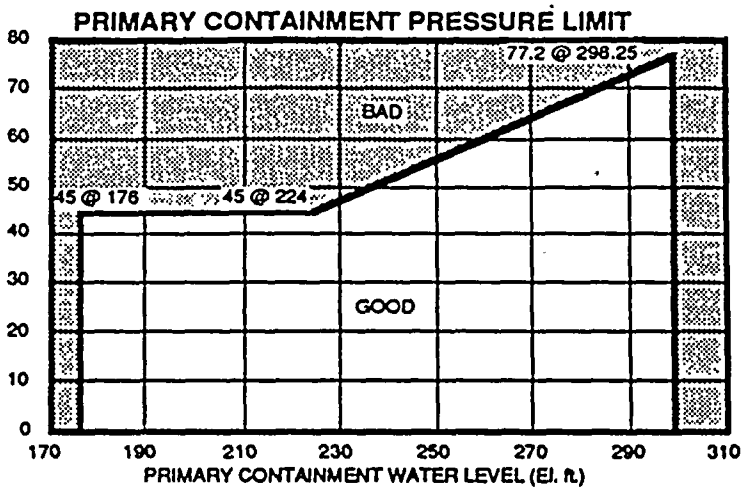
PC/P-2 When suppression chamber pressure exceeds 10.57 psig *(suppression chamber spray initiation pressure)*, but only if suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)* and drywell temperature and pressure are within the Drywell Spray Initiation Pressure Limits, shut down recirculation pumps and drywell cooling fans and initiate drywell sprays using only those pumps not required to assure adequate core cooling by continuous injection.



PC/P-3 When suppression chamber pressure cannot be maintained below the Pressure Suppression Pressure, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.



PC/P-4 Before suppression chamber pressure reaches the Primary Containment Pressure Limit, then irrespective of the offsite radioactivity release rate, vent the primary containment, defeating isolation interlocks if necessary, to reduce and maintain pressure below the Primary Containment Pressure Limit as follows:



- If suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)* vent the suppression chamber in accordance with ~~EOP-6, Attachment 21.~~
- If suppression pool water level is at or above El. 217 ft *(highest instrumented suppression pool water level)* or if the suppression chamber cannot be vented, vent the drywell in accordance with ~~EOP-6, Attachment 21.~~

procedure for primary containment venting.

PC/P-5 When suppression chamber pressure cannot be maintained below the primary containment pressure limit, then irrespective of whether adequate core cooling is assured:

- If suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)*, initiate suppression pool sprays.
- If suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)* and drywell temperature and pressure are within the Drywell Spray Initiation Limit, shut down recirculation pumps and drywell cooling fans and initiate drywell sprays.

SP/L Monitor and control suppression pool water level.

> If while executing the following steps Primary Containment Flooding is required, enter Contingency #6.

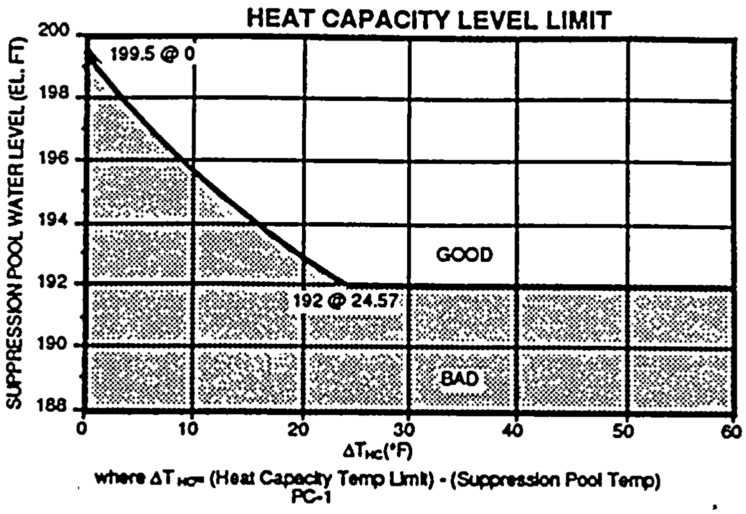
SP/L-1 Maintain suppression pool water level between El. 201 ft *(maximum suppression pool water level LCO)* and El. 199.5 ft *(minimum suppression pool water level LCO)*. Refer to sampling procedure prior to discharging water.

If suppression pool water level cannot be maintained above El. 199.5 ft *(minimum suppression pool water level LCO)*, execute step SP/L-2

If suppression pool water level cannot be maintained below El. 201 ft *(maximum suppression pool water level LCO)*, execute step SP/L-3.

SP/L-2 SUPPRESSION POOL WATER LEVEL BELOW El. 199.5 ft *(minimum suppression pool water level LCO)*

SP/L-2.1 Maintain suppression pool water level above the Heat Capacity Level Limit.

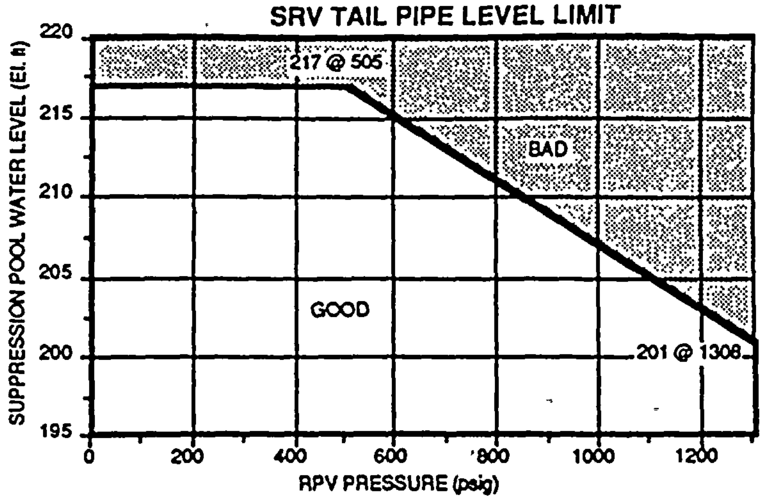


If suppression pool water level cannot be maintained above the Heat Capacity Level Limit, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; Enter RPV Control at Step RC-1 and execute it concurrently with this procedure.

SP/L-3 SUPPRESSION POOL WATER LEVEL ABOVE El. 201 ft *(maximum suppression pool water level LCO).*

Execute Steps SP/L-3.1, SP/L-3.2, and SP/L-3.3 concurrently.

SP/L-3.1 Maintain suppression pool water level below the SRV Tail Pipe Level Limit.



If suppression pool water level cannot be maintained below the SRV Tail Pipe Level Limit, enter RPV Control at Step RC-1 and execute it concurrently with this procedure.

If suppression pool water level and RPV pressure cannot be maintained below the SRV Tail Pipe Level Limit but only if adequate core cooling is assured, terminate injection into the Primary Containment from sources external to the primary containment except from boron injection systems and CRD.

If suppression pool water level and RPV pressure cannot be restored and maintained below the SRV Tail Pipe Level Limit, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

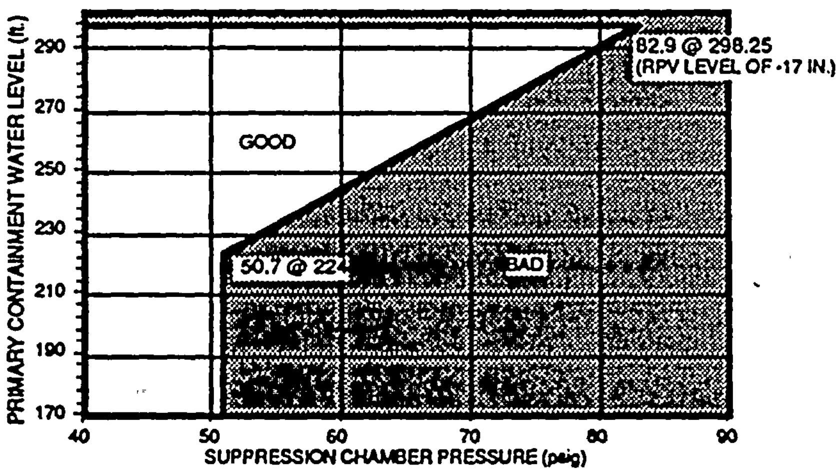
SP/L-3.2 Maintain suppression pool water level below El. 217 ft. *(highest instrumented suppression pool water level).*

If suppression pool water level cannot be maintained below El. 217 ft. *(highest instrumented suppression pool water level)*:

- Terminate drywell sprays.
- If adequate core cooling is assured, terminate injection into the Primary Containment from sources external to the primary containment except from boron injection systems and CRD.

SP/L-3.3 Maintain primary containment water level below the Maximum Primary Containment Water Level Limit.

MAX PRIMARY CONTAINMENT WATER LEVEL LIMIT



If primary containment water level cannot be maintained below the Maximum Primary Containment Water Level Limit, terminate injection into the Primary Containment from sources external to the primary containment irrespective of whether adequate core cooling is assured.

PC/H Monitor and control hydrogen and oxygen concentrations.

If while executing the following steps:

- The hydrogen or oxygen monitoring system is or becomes unavailable, sample the drywell and suppression chamber for hydrogen and oxygen in accordance with sampling procedure .
- Drywell or suppression chamber hydrogen concentration cannot be determined to be below 6% and drywell or suppression chamber oxygen concentration cannot be determined to be below 5%, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter RPV Control at Step RC-1 and execute it concurrently with this procedure; secure and prevent operation of drywell unit coolers and recombiners and, irrespective of the offsite radioactivity release rate, vent and purge the primary containment, defeating isolation interlocks if necessary, in accordance with Steps PC/H-4.1 through 4.4 until drywell and suppression chamber hydrogen concentrations can be determined to be below 6% or drywell and suppression chamber oxygen concentration can be determined to be below 5%.

PC/H-1 When drywell or suppression chamber hydrogen concentration reaches 1% *(minimum detectable hydrogen concentration)*, but only if the offsite radioactivity release rate is expected to remain below the offsite release rate LCO, vent and purge the primary containment to restore and maintain drywell and suppression chamber hydrogen concentrations below 1% *(minimum detectable hydrogen concentration)* as follows:

If while executing the following steps the offsite radioactivity release rate reaches the offsite release rate LCO, isolate the primary containment vent and purge.

PC/H-1.1 Refer to Sampling Procedure.

PC/H-1.2 If drywell and suppression chamber oxygen concentrations are below 5%, purge the primary containment with nitrogen in accordance with ~~OP-61A~~ procedure for containment purging.

PC/H-1.3 If drywell or suppression chamber oxygen concentrations are not below 5%, purge the primary containment with air or nitrogen in accordance with ~~OP-61A.~~ procedure for containment purging.

Execute Steps PC/H-2 and PC/H-3 concurrently.

PC/H-2 Monitor and control hydrogen and oxygen concentrations in the drywell.

PC/H-2.1 When drywell hydrogen concentration reaches 1% *(~~minimum hydrogen concentration for recombiner operation or~~ minimum detectable hydrogen concentration~~, whichever is higher~~)* but only if drywell hydrogen concentration is below 5% *(maximum hydrogen concentration for recombiner operation ~~or 6%, whichever is lower~~)* or drywell oxygen concentration is below 5% *(maximum oxygen concentration for recombiner operation ~~or 5%, whichever is lower~~)*, place hydrogen recombiners in service taking suction directly on the drywell and operate the drywell unit coolers.

PC/H-2.2 When drywell hydrogen concentration reaches 5% *(maximum hydrogen concentration for recombiner operation ~~or 6%, whichever is lower~~)* and drywell oxygen concentration reaches 5% *(maximum oxygen concentration for recombiner operation, ~~or 5%, whichever is lower~~)*, secure any hydrogen recombiner taking suction on the drywell.

PC/H-2.3 Continue in this procedure at Step PC/H-4.

PC/H-3 Monitor and control hydrogen and oxygen concentrations in the suppression chamber.

PC/H-3.1 When suppression chamber hydrogen concentration reaches 1% *(~~minimum hydrogen concentration for recombiner operation or~~ minimum detectable hydrogen concentration, ~~whichever is higher~~)* but only if suppression chamber hydrogen concentration is below 5% *(maximum hydrogen concentration for recombiner operation ~~or 6%, whichever is lower~~)* or suppression chamber oxygen concentration is below 5% *(maximum oxygen concentration for recombiner operation ~~or 5%, whichever is lower~~)*, place hydrogen recombiners in service taking suction directly on the suppression chamber..

If no hydrogen recombiner can be placed in service taking suction directly on the suppression chamber but only if the drywell hydrogen concentration is below 5% *(maximum hydrogen concentration for recombiner operation ~~or 6%, whichever is lower~~)* or drywell oxygen concentration is below 5% *(maximum oxygen concentration for recombiner operation ~~or 5%, whichever is lower~~)*, place hydrogen recombiners in service taking suction indirectly on the suppression chamber by way of the drywell..

PC/H-3.2 When suppression chamber hydrogen concentration reaches 5% *(maximum hydrogen concentration for recombiner operation ~~or 6%, whichever is lower~~)* and suppression chamber oxygen concentration reaches 5% *(maximum oxygen concentration for recombiner operation ~~or 5%, whichever is lower~~)*, secure all hydrogen recombiners taking suction directly on the suppression chamber.

PC/H-4 When drywell or suppression chamber hydrogen concentration reaches 6% and drywell or suppression chamber oxygen concentration is above 5%,

EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter RPV Control at Step RC-1 and execute it concurrently with this procedure; secure drywell unit coolers and, irrespective of the offsite radioactivity release rate, vent and purge the primary containment, defeating isolation interlocks if necessary, to restore and maintain drywell and suppression chamber hydrogen concentrations below 6%, or drywell and suppression chamber oxygen concentrations below 5% as follows:

> If while executing the following steps suppression pool or drywell sprays have been initiated and:
>
> - Suppression chamber pressure drops below 1.68 psig *(high drywell pressure scram setpoint)*, terminate suppression pool sprays.
> - Drywell pressure drops below 1.68 psig *(high drywell pressure scram setpoint)*, terminate drywell sprays.

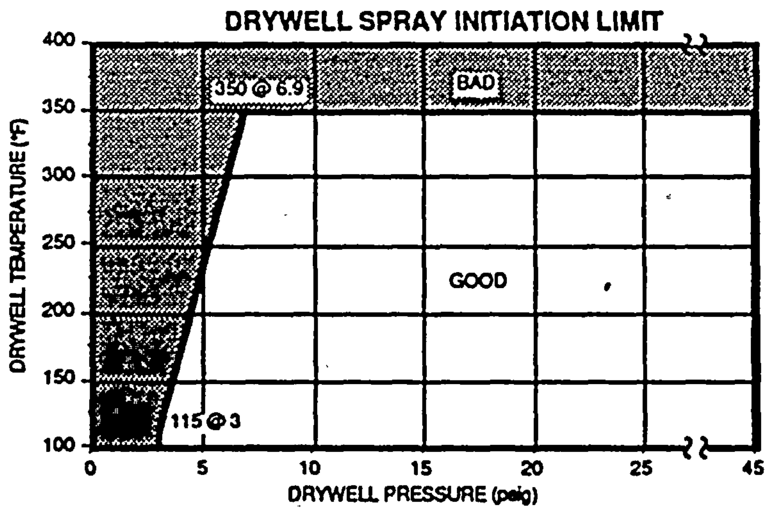
PC/H-4.1 If suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)*, initiate suppression pool sprays using only those pumps not required to assure adequate core cooling by continuous injection.

PC/H-4.2 If suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)*, vent the suppression chamber in accordance with procedure for primary containment venting.

If suppression pool water level is at or above El. 217 ft *(highest instrumented suppression pool water level)* or if the suppression chamber cannot be vented, vent the drywell in accordance with procedure for primary containment venting.

PC/H-4.3 If the suppression chamber or drywell can be vented, initiate and maximize the drywell purge flow.

PC/H-4.4 If suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)* and drywell temperature and pressure are within the Drywell Spray Initiation Limits, shut down recirculation pumps and drywell cooling fans and initiate drywell sprays using only those pumps not required to assure adequate core cooling by continuous injection.



PC/H-5 When drywell or suppression chamber hydrogen concentration cannot be restored and maintained below 6% and drywell or suppression chamber oxygen concentration cannot be restored and maintained below 5%, then irrespective of whether adequate core cooling is assured:

> If while executing the following steps suppression pool or drywell sprays have been initiated and:
>
> - Suppression chamber pressure drops below 1.68 psig *(high drywell pressure scram setpoint)*, terminate suppression pool sprays.
> - Drywell pressure drops below 1.68 psig *(high drywell pressure scram setpoint)*, terminate drywell sprays.

PC/H-5.1 If suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)*, initiate suppression pool sprays.

PC/H-5.2 If suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)* and drywell temperature and pressure are within the Drywell Spray Initiation Limit, shut down recirculation pumps and drywell cooling fans and initiate drywell sprays.

SECONDARY CONTAINMENT CONTROL

PURPOSE

The purpose of this guideline is to:

- Protect equipment in the secondary containment,
- Limit radioactivity release to the secondary containment, and either:
- Maintain secondary containment integrity, or
- Limit radioactivity release from the secondary containment.

ENTRY CONDITIONS

The entry conditions for this guideline are any of the following secondary containment conditions:

- differential pressure at or above 0 in. of water
- An area temperature above an isolation setpoint
- HVR exhaust radiation level above the isolation setpoint
- An unexpected high area radiation level alarm
- A floor drain sump water level high - high

OPERATOR ACTIONS

If while executing the following Steps HVR exhaust radiation level exceeds an isolation setpoint:

- Confirm or manually initiate isolation of HVR, and
- Confirm initiation of or manually initiate SBGT.

If while executing the following Steps:

- HVR isolates, and,
- HVR exhaust radiation level is below isolation setpoint,

restart HVR, defeating high drywell pressure and low RPV water level isolation interlocks if necessary.

Irrespective of the entry condition, execute Steps SC/T, SC/R, and SC/L concurrently.

SC/T Monitor and control reactor building temperatures.

SC/T-1 Operate available area coolers.

SC/T-2 When an area temperature exceeds its isolation setpoint, isolate all systems that are discharging into the area except systems required to shut down the reactor, assure adequate core cooling, protect Primary Containment integrity, or suppress a fire. 1

> Execute Steps SC/T-3 and SC/T-4 concurrently.

SC/T-3 If a primary system is discharging into the reactor building:

SC/T-3.1 Before any RB general area temperature on Els. 261, 289, 328 ft. reaches 135°F (when personnel access is required for either control rod insertion or boron injection) or any RB area temperature reaches 212°F *(maximum safe operating temperature)*, enter RPV Control at Step RC-1 and execute it concurrently with this procedure.

SC/T-3.2 When a RB general area temperature on Els. 261, 289, 328 ft. reaches 135°F (when personnel access is required for either control rod insertion or boron injection) or any RB area temperature reaches 212°F *(maximum safe operating temperature)* in more than one area, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

SC/T-4 When an area temperature exceeds its maximum safe operating temperature in more than one area, shut down the reactor.

SC/R Monitor and control reactor building radiation levels.

SC/R-1 When a radiation level exceeds its high alarm setpoint, isolate all systems that are discharging into that area except systems that are required to shut down the reactor, assure adequate core cooling, protect Primary Containment integrity, or suppress a fire.

Execute Steps SC/R-2 and SC/R-3 concurrently.

SC/R-2 If a primary system is discharging into the reactor building:

SC/R-2.1 Before any area radiation level reaches 10 R/hr. *(maximum safe operating radiation level)*, enter RPV Control at Step RC-1 and execute it concurrently with this procedure.

SC/R-2.2 When an area radiation level exceeds 10 R/hr. *(maximum safe operating radiation level in more than one area)*, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

SC/R-3 When an area radiation level exceeds 10 R/hr. *(maximum safe operating radiation level in more than one area)*, shut down the reactor.

SC/L Monitor and control reactor building water levels.

SC/L-1 When a floor drain sump is above its high - high level setpoint, operate available sump pumps to restore and maintain it below its high - high level setpoint.

If any floor drain sump cannot be restored and maintained below its high - high level setpoint, isolate all systems that are discharging water into the sump or area except systems required to shut down the reactor, assure adequate core cooling, protect Primary Containment integrity, or suppress a fire.

Execute Steps SC/L-2 and SC/L-3 concurrently.

SC/L-2 If a primary system is discharging into the reactor building:

SC/L-2.1 Before any area water level reaches a RB flooding alarm level, enter RPV Control at Step RC-1 and execute it concurrently with this procedure.

SC/L-2.2 When an area water level reaches a RB flooding alarm level in more than one area, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

SC/L-3 When an area water level reaches a RB flooding alarm level in more than one area, shut down the reactor.

RADIOACTIVITY RELEASE CONTROL

PURPOSE

The purpose of this guideline is to limit radioactivity release into areas outside the primary and secondary containments.

ENTRY CONDITION

The entry conditions for this guideline are:

- Stack GEMs exceeds the alarm value setpoint.
- Vent GEMs exceeds the alarm value setpoint.
- DRMS Liquid Effluent Monitor exceeds the alert value.

OPERATOR ACTIONS

> If while executing the following steps Turbine Building HVAC is shutdown, restart Turbine Building HVAC.

RR-1 Isolate all primary systems that are discharging into areas outside the primary and secondary containments except systems required to assure adequate core cooling or shut down the reactor.

RR-2 When offsite radioactivity release rate approaches or exceeds the Emergency Plan "General Emergency" level but only if a primary system is discharging into an area outside the primary and secondary containments, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter RPV Control at Step RC-1 and execute it concurrently with this procedure.

MSIV LEAKAGE CONTROL

PURPOSE

The purpose of this guideline is to limit non-condensible radioactive gas release through the MSIVs.

ENTRY CONDITIONS

The entry condition for this guideline is a condition which requires MSIV isolation and a high - high main steam line radiation level with any of the following:

- Stack or vent GEMs exceed the alarm setpoint, or
- Turbine building HVAC exhaust radiation above the Alert level or cannot be determined, or
- Offgas pretreatment radiation above the Alert level or cannot be determined.

OPERATOR ACTIONS

If while executing the following steps:

- Turbine Building HVAC exhaust radiation level exceeds the Turbine Building Release Limit or cannot be determined, verify the Turbine Building HVAC is operating in the un-isolated mode if available ~~(OP-55).~~
- Control Building HVAC radiation level cannot be maintained below 5.92×10^{-6} µCi/cc, verify that the control building HVAC is operating in the pressurization mode ~~(OP-53A, Section H).~~

MSL-1 Verify that the MSIVs are closed.

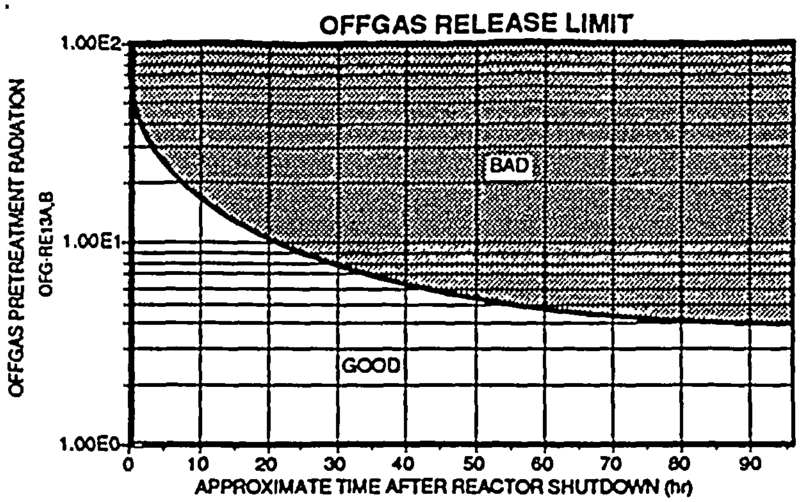
MSL-2 When main steam line radiation exceeds the MSL Rad Limit or cannot be determined, and either:

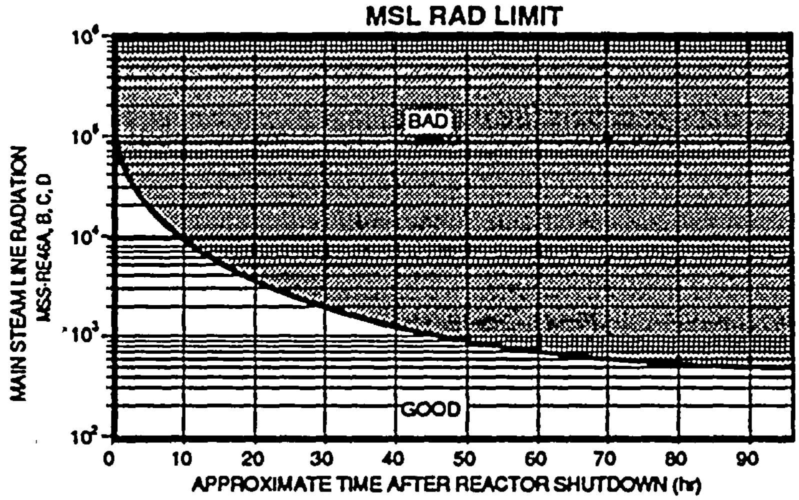
- Turbine building radiation level exceeds the Turbine Building Release Limit or cannot be determined, or
- Offgas pretreatment radiation level exceeds the Offgas Release Limit or cannot be determined, or
- Offsite radiation release rate which exceeds the Emergency Plan "Alert" level, then operate available SJAEs through Offgas.

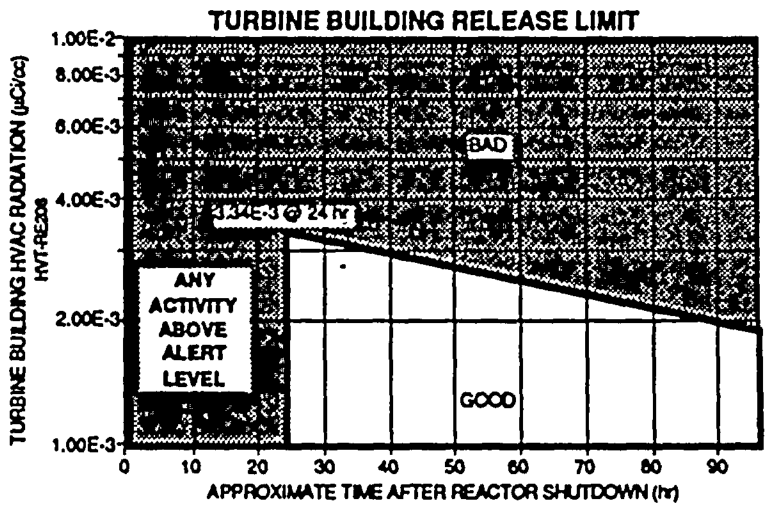
MSL-2.1 If SJAEs or Offgas are not available and Turbine Building HVAC radiation level exceeds the Turbine Building Release Limit, then:

1. Close the following valves:
    - Main turbine stop, control, and bypass valves
    - 2ARC-MOV5A, B, and C
    - 2MSS-AOV92A and B
    - 2ASS-~~A~~ M OV148
    - 2TME-AOV121
    - 2ARC-AOV105
    - 2ARC-MOV15A and B
2. Establish main turbine seals and start all circulating water pumps.
3. Fill the main steam lines between the MSIVs with water.

MSL-3 If offsite radioactivity release rate cannot be maintained below the Emergency Plan "General Emergency" level and a primary system is discharging into an area outside the primary and secondary containments, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter RPV Control at Step RC-1 and execute it concurrently with this procedure.


OFFGAS RELEASE LIMIT
1.00E2
1.00E1
1.00E0
OFFGAS PRETREATMENT RADIATION
OFG-RE13A,B
BAD
GOOD
0 10 20 30 40 50 60 70 80 90
APPROXIMATE TIME AFTER REACTOR SHUTDOWN (hr)


MSL RAD LIMIT
MAIN STEAM LINE RADIATION
MSS-RE46A, B, C, D
BAD
GOOD
0 10 20 30 40 50 60 70 80 90
APPROXIMATE TIME AFTER REACTOR SHUTDOWN (hr)

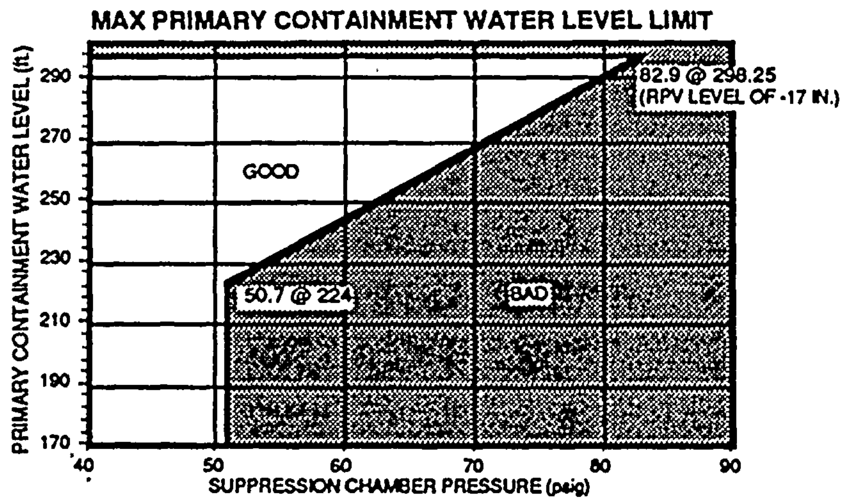

TURBINE BUILDING RELEASE LIMIT
1.00E-2
8.00E-3
6.00E-3
4.00E-3
2.00E-3
1.00E-3
TURBINE BUILDING HVAC RADIATION (µCi/cc)
HVT-RE208
BAD
3.34E-3 @ 24 hr
ANY ACTIVITY ABOVE ALERT LEVEL
GOOD
0 10 20 30 40 50 60 70 80 90
APPROXIMATE TIME AFTER REACTOR SHUTDOWN (hr)

CONTINGENCY
#1
ALTERNATE
LEVEL
CONTROL

If while executing the following steps:

- Any control rod cannot be determined to be inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* and it has not been determined that the reactor will remain shutdown under all conditions without boron, enter Contingency #5.
- RPV water level cannot be determined, enter Contingency #4.
- RPV water level is rising, enter RPV Control at Step RC/L.
- RPV water level drops below 17.8 in. *(ADS initiation setpoint)*, place the ADS logic inhibit switches in ON.

If while executing the following steps primary containment water level and suppression chamber pressure cannot be maintained below the Maximum Primary Containment Water Level Limit, then irrespective of whether adequate core cooling is assured terminate injection into the primary containment from sources external to the primary containment until primary containment water level and suppression chamber pressure can be maintained below the Maximum Primary Containment Water Level Limit.



C1-1 Line up for injection, start pumps, and irrespective of pump NPSH and vortex limits, raise injection flow to the maximum with 2 or more of the following injection subsystems:

- Condensate
- HPCS
- LPCI-A with injection through the heat exchanger as soon as possible.
- LPCI-B with injection through the heat exchanger as soon as possible.
- LPCI-C
- LPCS

If less than 2 of the injection subsystems can be lined up, commence lining up as many of the following alternate injection subsystems as possible:

- RHR service water crosstie
- Fire system
- ECCS keep full systems
- SLC (test tank)
- SLC (boron tank)
- Condensate transfer

C1-2 If RPV pressure is above 195 psig *(highest RPV pressure at which the shutoff head of a low-water-quality alternate injection subsystem (excluding SLC) is reached)*:

> If while executing the following steps RPV pressure drops below 195 psig *(highest RPV pressure at which the shutoff head of a low-water-quality alternate injection subsystem (excluding SLC) is reached)*, continue in this procedure at Step C1-3.

C1-2.1 If no injection subsystem is lined up for injection with at least one pump running, start pumps in alternate injection subsystems which are lined up for injection.

C1-2.2 When RPV water level drops to -14.4 in. *(top of active fuel)*:

- If any system, injection subsystem or alternate injection subsystem is lined up with at least one pump running, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.
- If no system, injection subsystem or alternate injection subsystem is lined up with at least one pump running, STEAM COOLING IS REQUIRED.

C1-3 When RPV pressure drops below 195 psig *(highest RPV pressure at which the shutoff head of a low-water-quality alternate injection subsystem (excluding SLC) is reached)*:

C1-3.1 Line up for injection, start pumps, and irrespective of pump NPSH and vortex limits, raise injection flow to the maximum with all systems and injection subsystems.

C1-3.2 When RPV water level drops to -14.4 in. *(top of active fuel)*, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; line up for injection, start pumps, and raise injection flow to the maximum with all alternate injection subsystems.

If RPV water level cannot be restored and maintained above -14.4 in. *(top of active fuel)*, PRIMARY CONTAINMENT FLOODING IS REQUIRED; enter Contingency # 6.

CONTINGENCY #2 EMERGENCY RPV DEPRES-SURIZATION

C2-1 When either:

- All control rods can be determined to be inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)*, or
- It has been determined that the reactor will remain shutdown under all conditions without boron, or
- All injection into the RPV except from boron injection systems, CRD, and RCIC has been terminated and prevented,

C2-1.1 If a high drywell pressure ECCS initiation signal (1.68 psig *(drywell pressure which initiates ECCS)*) exists, prevent injection from those LPCS and LPCI pumps not required to assure adequate core cooling.

C2-1.2 If suppression pool water level is above 192 ft. *(lowest instrumented suppression pool water level)*:

- Open all ADS valves.
- If any ADS valve cannot be opened, open other SRVs until 7 *(number of SRVs dedicated to ADS)* valves are open.

C2-1.3 If less than 4 *(Minimum Number of SRVs Required for Emergency Depressurization)* SRVs are open, rapidly depressurize the RPV, defeating isolation interlocks if necessary, using one or more of the following:

- Main condenser
- RHR (steam condensing mode)
- Main steam line drains
- RCIC steam line
- Head vent

If RPV water level cannot be determined, enter Contingency #4.

C2-2 When either:

- All control rods are inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)*, or
- It has been determined that the reactor will remain shutdown under all conditions without boron, or
- 769 pounds *(Cold Shutdown Boron Weight)* of boron have been injected into the RPV, or
- The reactor is shutdown and no boron has been injected into the RPV,

enter RPV control at Step RC/P-4.

CONTINGENCY
#3
STEAM
COOLING

If while executing this step Emergency RPV Depressurization is required, RPV water level cannot be determined, or any system, injection subsystem, or alternate injection subsystem is lined up for injection with at least one pump running, enter Contingency #2.

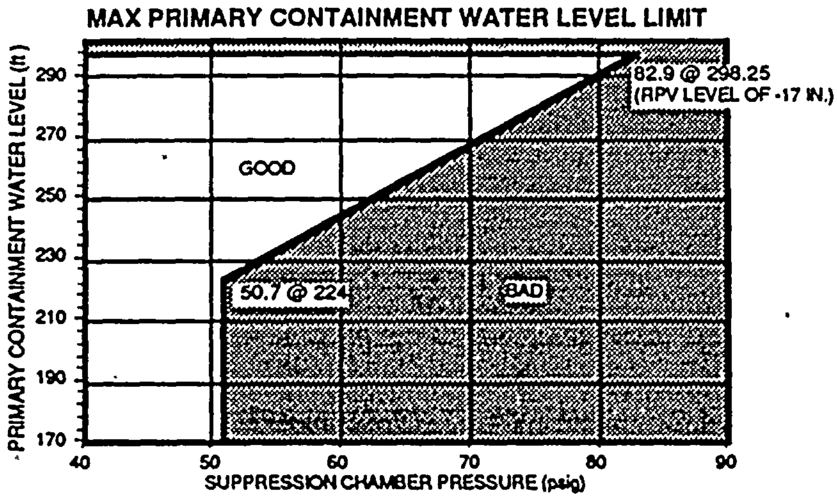
C3-1 When RPV water level drops to -58.2 in. *(Minimum Zero Injection RPV Water Level)* enter Contingency #2.

CONTINGENCY
#4
RPV
FLOODING

If while executing the following steps RPV water level can be determined:

- If any control rod cannot be determined to be inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* and it has not been determined that the reactor will remain shutdown under all conditions without boron, enter Contingency #5 and RPV Control at Step RC/P-4 and execute these procedures concurrently.
- If all control rods are inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* or it has been determined that the reactor will remain shutdown under all conditions without boron, enter RPV Control at Steps RC/L and RC/P-4 and execute these steps concurrently.

If while executing the following steps primary containment water level and suppression chamber pressure cannot be maintained below the Maximum Primary Containment Water Level Limit, then irrespective of whether adequate core cooling is assured, terminate injection into the Primary Containment from sources external to the Primary Containment until primary containment water level and suppression chamber pressure can be maintained below the Maximum Primary Containment Water Level Limit.



C4-1 If any control rod cannot be determined to be inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* and it has not been determined that the reactor will remain shutdown under all conditions without boron, flood the RPV as follows:

If while executing the following steps either all control rods are inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* or it has been determined that the reactor will remain shutdown under all conditions without boron but RPV water level cannot be determined, continue in this procedure at Step C4-2.

C4-1.1 Terminate and prevent all injection into the RPV except from boron injection systems and CRD until RPV pressure is below the Minimum Alternate RPV Flooding Pressure.

NUMBER OF OPEN SRVs	MINIMUM ALTERNATE RPV FLOODING PRESSURE (psig)
7 or more	135
6	160
5	195
4	247
3	334
2	508
1	1031

If less than 1 *(minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)* SRV can be opened, continue in this procedure.

C4-1.2 If at least 4 *(Minimum Number of SRVs Required for Emergency Depressurization)* SRVs can be opened, close the MSIVs, main steam line drain valves, RCIC and RHR steam condensing isolation valves.

C4-1.3 Commence and slowly raise injection into the RPV with the following systems until at least 1 *(minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)* SRV is open and RPV pressure is above the Minimum Alternate RPV Flooding Pressure: 7

- Feedwater pumps, defeating high RPV water level trip interlocks if necessary
- Condensate pumps
- CRD

If less than 1 *(minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)* SRV is open or RPV pressure cannot be raised to above the Minimum Alternate RPV Flooding Pressure, commence and, irrespective of pump NPSH and vortex limits, slowly raise injection into the RPV with the following systems until at least 1 *(minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)* SRV is open and RPV pressure is above the Minimum Alternate RPV Flooding Pressure:

- HPCS, defeating high RPV water level isolation interlocks if necessary.
- LPCS
- LPCI, with injection through the heat exchangers as soon as possible.
- RHR service water crosstie
- Fire system
- ECCS keep full systems
- Condensate transfer

If less than 1 *(minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)* SRV is open or RPV pressure cannot be raised to above the Minimum Alternate RPV Flooding Pressure, PRIMARY CONTAINMENT FLOODING IS REQUIRED, enter Contingency #6 and RPV Control at Step RC/P-4 and execute these procedures concurrently.

C4-1.4 When at least 1 *(minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)* SRV is open and RPV pressure is above the Minimum Alternate RPV Flooding Pressure, control injection to maintain at least 1 *(minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)* SRV open and RPV pressure above the Minimum Alternate RPV Flooding Pressure but as low as practicable.

C4-1.5 When all control rods are inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* or it has been determined that the reactor will remain shutdown under all cónditions without boron, continue in this procedure.

C4-2 If at least 4 *(Minimum Number of SRVs Required for Emergency Depressurization)* SRVs can be opened or if a HPCS or feedwater pump is available for injection, close the MSIVs, main steam line drain valves, RCIC and RHR steam condensing isolation valves.

C4-3 Flood the RPV as follows:

C4-3.1 Commence and, irrespective of pump NPSH and vortex limits, raise injection into the RPV with the following systems until at least 4 *(Minimum Number of SRVs Required for Emergency Depressurization)* SRVs are open and RPV pressure is not dropping and is 61 psig *(Minimum RPV Flooding Pressure)* or more above suppression chamber pressure:

- HPCS, defeating high RPV water level isolation interlocks if necessary.
- Feedwater pumps, defeating high RPV water level trip interlocks if necessary.
- LPCS
- LPCI with injection through the heat exchangers as soon as possible.
- Condensate pumps
- CRD
- RHR service water crosstie
- Fire system
- ECCS keep full system
- SLC (test tank)
- SLC (boron tank)
- Condensate Transfer

If less than 4 *(Minimum Number of SRVs Required for Emergency Depressurization)* SRVs are open or RPV pressure cannot be maintained at least 61 psig *(Minimum RPV Flooding Pressure)* above suppression chamber pressure, PRIMARY CONTAINMENT FLOODING IS REQUIRED, enter Contingency #6 and RPV Control at Step RC/P-4 and execute these procedures concurrently.

C4-3.2 When at least 4 *(Minimum Number of SRVs Required for Emergency Depressurization)* SRVs are open and RPV pressure can be maintained at least 61 psig *(Minimum RPV Flooding Pressure)* above suppression chamber pressure, control injection to maintain at least 4 *(Minimum Number of SRV Required for Emergency Depressurization)* SRVs open and RPV pressure at least 61 psig *(Minimum RPV Flooding Pressure)* above suppression chamber pressure but as low as practicable.

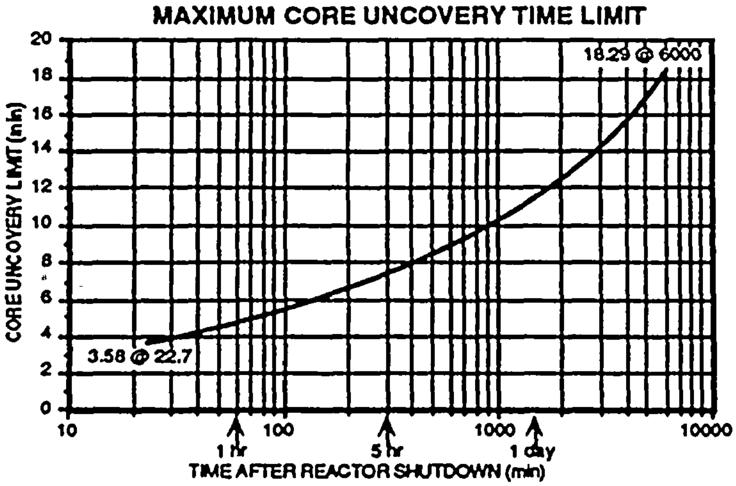
C4-4 When:

- RPV water level instrumentation is available, and
- Hottest drywell temperature is below 212°F, and
- RPV pressure has remained at least 61 psig *(Minimum RPV Flooding Pressure)* above suppression chamber pressure for at least the Minimum Core Flooding Interval:

Number of Open SRVs	Minimum Core Flooding Interval (min)
7 or more	22.71
6	31.46
5	48.23
4	81.95

Terminate all injection into the RPV and reduce RPV water level until RPV water level indication is restored.

If RPV water level indication is not restored within the Maximum Core Uncovery Time Limit after commencing termination of injection into the RPV, return to Step C4-3.1.

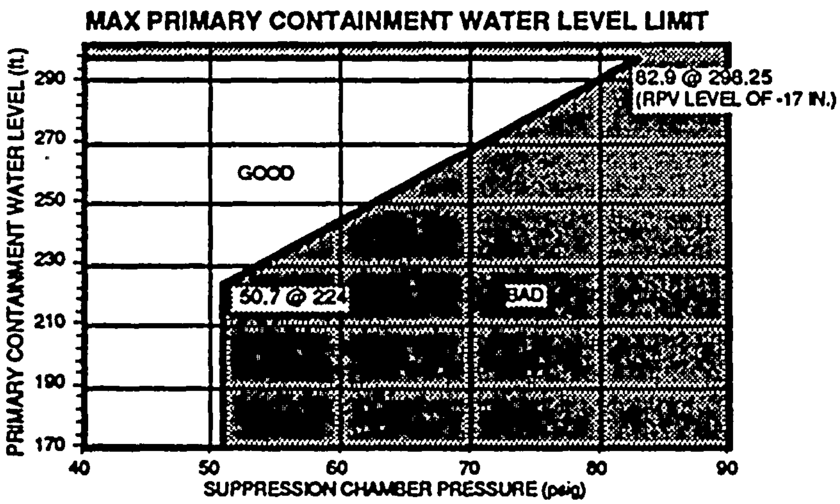


C4-5 Enter RPV Control at Steps RC/L and RC/P-4 and execute these steps concurrently.

CONTINGENCY
#5
LEVEL / POWER
CONTROL

If while executing the following steps:

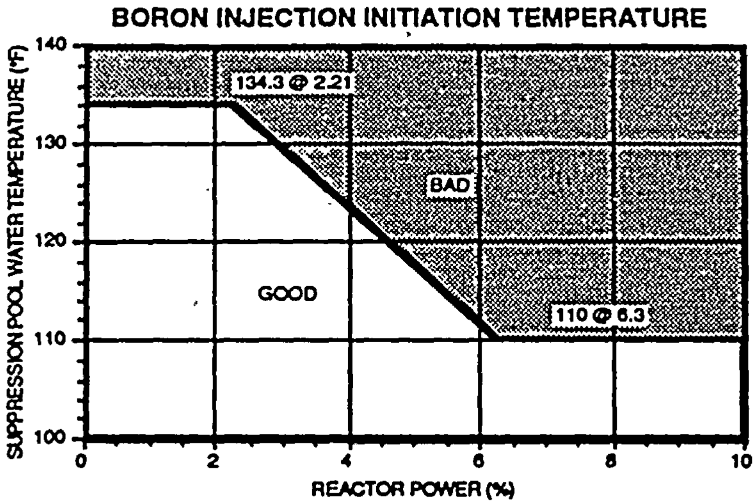
- RPV water level cannot be determined, enter Contingency #4.
- All control rods are inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* or it has been determined that the reactor will remain shutdown under all conditions without boron, enter RPV Control at Step RC/L.
- Primary containment water level and suppression chamber pressure cannot be maintained below the Maximum Primary Containment Water Level Limit, then irrespective of whether adequate core cooling is assured terminate injection into the Primary Containment from sources external to the Primary Containment until primary containment water level and suppression chamber pressure can be maintained below the Maximum Primary Containment Water Level Limit.



C5-1 Place the ADS logic inhibit switches in ON.

C5-2 If:

- Reactor power is above 4% *(APRM downscale trip)* or cannot be determinied, and
- Suppression pool temperature is above the Boron Injection Initiation Temperature, and



- Either an SRV is open or opens or drywell pressure is above 1.68 psig *(high drywell pressure scram setpoint)*,

Then:

- If any Main Steam Line is open, bypass IAS and low RPV water level MSIV isolation interlocks and restore the IAS supply to the containment, and
- Lower RPV water level, irrespective of any consequent reactor power or RPV water level oscillations, by terminating and preventing all injection into the RPV except from boron injection systems and CRD until either:
  - Reactor power drops below 4% *(APRM downscale trip)*, or
  - RPV water level reaches -14.4 in. *(top of active fuel)*, or
  - All SRVs remain closed and drywell pressure remains below 1.68 psig *(high drywell pressure scram setpoint)*.

If while executing the following steps Emergency RPV Depressurization is required, continue in this procedure at Step C5-3.1.

If while executing the following step:

- Reactor power is above 4% *(APRM downscale trip)* or cannot be determined, and
- RPV water level is above -14.4 in. *(top of active fuel)* and
- Suppression pool temperature is above the Boron Injection Initiation Temperature, and
- Either an SRV is open or opens or drywell pressure is above 1.68 psig*(high drywell pressure scram setpoint)*,

return to Step C5-2.

C5-3 Maintain RPV water level either: 7

- If RPV water level was deliberately lowered in Step C5-2, between -45.2 in. *(Minimum Steam Cooling RPV Water Level)* and the level to which it was lowered, or
- If RPV water level was not deliberately lowered in Step C5-2, between -14.4 in. *(top of active fuel)* and +202.3 in. *(high level trip setpoint)*, with the following systems:
  - Condensate / feedwater
  - CRD
  - RCIC with suction from the condensate storage tank, if available defeating low RPV pressure isolation interlocks. 3 4

If RPV water level was not deliberately lowered in Step C5-2 and RPV water level cannot be maintained above -14.4 in. *(top of active fuel)* maintain RPV water level between -45.6 in. *(Minimum Steam Cooling RPV Water Level)* and +202.3 in. *(high level trip setpoint).*

If RPV water level cannot be maintained above -45.6 in. *(Minimum Steam Cooling RPV Water Level),* EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

C5-3.1 Terminate and prevent all injection into the RPV except from boron injection systems, CRD, and RCIC until RPV pressure is below the Minimum Alternate RPV Flooding Pressure.

NUMBER OF OPEN SRVs	MINIMUM ALTERNATE RPV FLOODING PRESSURE (psig)
7 or more	135
6	160
5	195
4	247
3	334
2	508
1	1031

If no *(minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure =1)* SRV can be opened, continue in this procedure.

C5-3.2 Commence and slowly raise injection into the RPV with the following systems to restore and maintain RPV water level above -14.4 in. *(top of active fuel)*:

- Condensate / feedwater
- CRD
- RCIC with suction from the condensate storage tank, if available defeating low RPV pressure isolation interlocks if necessary.

If RPV water level cannot be restored and maintained above -14.4 in. *(top of active fuel)*, restore and maintain RPV water level above -45.6 in. *(Minimum Steam Cooling RPV Water Level)*.

If RPV water level cannot be restored and maintained above -45.6 in. *(Minimum Steam Cooling RPV Water Level)*, commence and, irrespective of pump NPSH and vortex limits, slowly raise injection into the RPV with the following systems to restore and maintain RPV water level above -45.6 in. *(Minimum Steam Cooling RPV Water Level)*:

- HPCS
- LPCS
- LPCI with injection through the heat exchangers as soon as possible.
- RHR service water crosstie
- Fire system
- ECCS keep full systems
- Condensate Transfer

If RPV water level cannot be restored and maintained above -45.6 in. *(Minimum Steam Cooling RPV Water Level)*, PRIMARY CONTAINMENT FLOODING IS REQUIRED, enter Contingency #6.

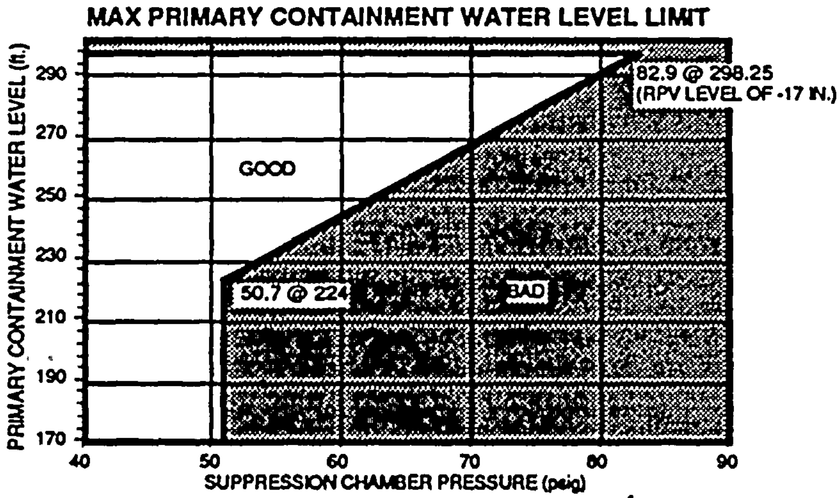
C5-3.3 When RPV water level can be maintained above -45.6 in. *(Minimum Steam Cooling RPV Water Level)*, return to Step C5-3.

C5-4 When either all control rods are inserted to or beyond position 02 or it has been determined that the reactor will remain shutdown under all conditions without boron, exit this procedure and enter RPV Control at Step RC/L.

CONTINGENCY
#6
PRIMARY CONTAINMENT FLOODING

If while executing the following steps:

- Primary containment water level and suppression chamber pressure cannot be maintained below the Maximum Primary Containment Water Level Limit, then irrespective of whether adequate core cooling is assured terminate injection into the primary containment from sources external to the primary containment until primary containment water level and suppression chamber pressure can be maintained below the Maximum Primary Containment Water Level Limit.



- RPV water level can be restored and maintained above -14.4 in. *(top of active fuel)*, enter RPV Control at Step RC/L.

C6-1 Operate the following systems:

- HPCS with suction from the condensate storage tank when available.
- LPCS
- Condensate / Feedwater
- CRD
- RCIC with suction from the condensate storage tank only, defeating low RPV pressure isolation interlocks if necessary.
- RHR service water crosstie
- Fire system
- ECCS keep - full systems
- Condensate transfer
- LPCI, unless RHR service water crosstie, condensate transfer, or fire system are available

Execute Steps C6-2 and C6-3 concurrently.

C6-2 When primary containment water level reaches El. 248 ft. 6 in. *(elevation of the bottom of the lowest recirculation piping)*, then irrespective of the offsite radioactivity release rate vent the RPV, defeating isolation interlocks if necessary, until RPV water level reaches -38 in *(minimum level for Primary Containment Flooding)* using the condenser.

C6-3 When primary containment water level reaches El. 292.5 ft. *(elevation of containment vent minus adjustment for instrument accuracy)*, continue to fill the Primary Containment injecting into the RPV only, until Primary Containment water level reaches El. 296.5 ft. (RPV level of -38 in.) *(minimum level for Primary Containment flooding)*.

Maintain primary containment water level between El. 296.5 ft. (RPV level of -38 in.) and the Maximum Primary Containment Water Level Limit with the following systems taking suction from sources external to the primary containment only when required, injecting via the RPV:

- HPCS
- LPCS
- Condensate / Feedwater
- CRD
- LPCI
- Head spray
- RHR service water crosstie
- Fire system
- ECCS keep - full systems
- Condensate transfer

APPENDIX A

A Comparison Document

A comparison of the BWROG EPG rev. 4 with NMP2 PSTGs (including documentation of all deviations),

and

A comparison of the NMP2 EOPs with the PSTGs (including documentation of all variances).

Appendix A
TABLE OF CONTENTS

NMP2 PSTG STEP

This document delineates the .... as height above sea level.

BWROG EPG STEP

Based on the various BWR .... specified in these procedures.

DEVIATIONS

The introduction section of the PSTG has been specifically taylored to NMP2.

EOP VARIANCE

The EOPs contain no introduction section. This is neither required nor appropriate.

Appendix A. Section: Cautions

NMP2 PSTG STEP

CAUTION #1

An RPV water level instrument may be used to determine RPV water level only when all the following conditions are satisfied for that instrument:

- The hottest drywell temperature is below the RPV Saturation Temperature.
- For each of the instruments in the following table, the instrument reads above the Minimum Indicated Level:

BWROG EPG STEP

CAUTION #1

An RPV water level instrument may be used to determine RPV water level only when all of the following conditions are satisfied for that instrument:

1. The temperature near all the instrument runs are below the RPV Saturation Temperature.
2. For each of the instruments in the following table, the instrument reads above the Minimum Indicated Level or the temperatures near all the instrument reference leg vertical runs are below the Maximum Run Temperature.

[A Tabulation of Maximum Run Temperatures and Minimum Indicated Levels for various reactor ranges]

<u>*Appendix A, Section: Cautions*</u>

<u>*DEVIATIONS*</u>

- "Hottest drywell temperature is used in lieu of "temperatures near all the instrument runs".

  No indication of drywell temperature near RPV water level instrument vertical runs is provided at NMP2. Therefore, the hottest drywell temperature is a conservative substitute.

- The words "or the temperatures near all the instrument reference leg vertical runs are below the Maximum Run Temperature" were deleted.

  No indication of drywell temperature near RPV water level instrument vertical runs is provided at NMP2.

- The RPV Saturation Temperature curve was truncated at 350°F.

  The range of drywell temperature instruments at NMP2 does not extend up to the calculated end point of the RPV Saturation Temperature Curve. Although the actual margin may be wider, the curve is conservatively truncated åt the highest instrumented drywell temperature.

- For Primary Containment Control, Caution 1 does not include the portion derived from the Secondary Containment. For Secondary Containment Control, Caution 1 does not include the portion derived from the Primary Containment.

  When in Primary containment Control, those parameters derived from the secondary containment do not apply, and vise versa.

Appendix A, Section: Cautions

EOP VARIANCE

- Values in the table for Minimum Indicated Level was rounded in the conservative direction to a value consistent with the accuracy afforded by control room panel indicators.

- The column for drywell temperature above 350°F was deleted since NMP2 has no indication above 350°F. The conservative values of the below 350°F column are always used.

Appendix A, Section: Cautions

NMP2 PSTG STEP

None.

BWROG EPG STEP

CAUTION #2

[Heated reference leg instruments] may not be used to determine RPV water level during rapid RPV depressurization below 500 psig.

DEVIATIONS

This caution has been deleted.

NMP2 has no RPV water level instruments with heated reference legs.

EOP VARIANCE

None.

Appendix A. Section: Cautions

NMP2 PSTG STEP

CAUTION #3

Operating RCIC turbines below 1500 RPM *(minimum turbine speed limit per turbine vendor manual)* may result in unstable system operation and equipment damage.

BWROG STEP

CAUTION #3

Operating HPCI or RCIC turbines below [2200 rpm (minimum turbine speed limit per turbine vendor manual)] may result in unstable system operation and equipment damage.

DEVIATIONS

The reference to HPCI was deleted.

NMP2 does not have a HPCI.

EOP VARIANCE

The statement "unstable system operation" is deleted in the flowcharts to simplify the statement. No change in technical content.

NMP2 PSTG STEP

CAUTION #4

Elevated suppression chamber pressure may trip the RCIC turbine on high exhaust pressure.

BWROG EPG STEP

CAUTION #4

Elevated suppression chamber pressure may trip the RCIC turbine on high exhaust pressure.

DEVIATIONS

None.

EOP VARIANCE

The words "on high exhaust pressure were deleted from the flowcharts to simplify the statement.

Appendix A. Section: Cautions

NMP2 PSTG STEP

CAUTION #5

If HPCS is taking suction from the suppression pool and suppression pool temperature exceeds the HPCS pump NPSH Limit, the pump may be damaged and become inoperable.

BWROG EPG STEP

CAUTION #5

If HPCS is taking suction from the suppression pool and suppression pool temperature exceeds the HPCS pump NPSH Limit, the pump may be damaged and become inoperable.

DEVIATIONS

None.

EOP VARIANCE

Sentence reworded and simplified in the flowcharts.

Appendix A. Section: Cautions

NMP2 PSTG STEP

CAUTION #6

Cooldown rates above 100°F/hr *(RPV cooldown rate LCO)* may be required to accomplish this step.

BWROG EPG STEP

CAUTION #6

Cooldown rates above [100°F/hr (RPV cooldown rate LCO)] may be required to accomplish this step.

DEVIATIONS

None.

EOP VARIANCE

Flowchart was reworded to better portray the intent of this caution.

Appendix A. Section: Cautions

NMP2 PSTG STEP

CAUTION #7

Raising injection flow rapidly may induce a large power excursion and result in substantial core damage.

BWROG EPG STEP

CAUTION #7

A rapid increase in injection into the RPV may induce a large power excursion and result in substantial core damage.

DEVIATIONS

The caution is reworded to delete the use of the word "increase". Plant specific wording to enhance verbal communications. Consistent with Operations Department Instruction N2-ODI-1.06. The wording does not change the intent of the caution.

EOP VARIANCE

None.

NMP2 PSTG STEP

PURPOSE

The purpose of this guideline is to:

- Maintain adequate core cooling,
- Shut down the reactor, and
- Cool down the RPV to cold shutdown conditions (RPV water temperature ≤ 200°F *(cold shutdown conditions)*).

BWROG EPG STEP

PURPOSE

The purpose of this guideline is to:

- Maintain adequate core cooling,
- Shut down the reactor, and
- Cool down the RPV to cold shutdown conditions ([100°F < RPV water temperature < 212°F (cold shutdown conditions)]).

DEVIATIONS

None.

EOP VARIANCE

The purpose is not included in the flowchart. This is considered a training item and not required as a procedure note or step.

NMP2 PSTG STEP

ENTRY CONDITIONS

The entry conditions for this guideline are any of the following:

- RPV water level below 159.3 in. *(low level scram setpoint)*
- RPV pressure above 1037 psig *(high RPV pressure scram setpoint)*
- Drywell pressure above 1.68 psig *(high drywell pressure scram setpoint)*
- A condition which requires reactor scram, and reactor power above 4% *(APRM downscale trip)* or cannot be determined

BWROG EPG STEP

ENTRY CONDITIONS

The entry conditions for this guideline are any of the following:

- RPV water level below [+12 in. (low level scram setpoint)]
- RPV pressure above [1045 psig (high RPV pressure scram setpoint)]
- Drywell pressure above [2.0 psig (high drywell pressure scram setpoint)]
- A condition which requires reactor scram, and reactor power above [3% (APRM downscale trip)] or cannot be determined

DEVIATIONS

None.

EOP VARIANCE

None.

NMP2 PSTG STEP

OPERATOR ACTIONS

RC-1 If reactor scram has not been initiated, initiate reactor scram.

> Irrespective of the entry conditions, execute Steps RC/L, RC/P, and RC/Q concurrently.

BWROG EPG STEP

OPERATOR ACTIONS

RC-1 If reactor scram has not been initiated, initiate reactor scram.

> Irrespective of the entry conditions, execute [Steps RC/L, RC/P, and RC/Q] concurrently.

DEVIATIONS

None.

EOP VARIANCE

An additional step was added to the flowchart regarding activation of the emergency plan if required. This is added to flag the operator the potential need to implement the emergency plan.

NMP2 PSTG STEP

RC/L Monitor and control RPV water level. 1

RC/L-1 Initiate each of the following which should have initiated but did not:

- Isolation
- ECCS
- Emergency Diesel Generators

BWROG EPG STEP

RC/L Monitor and control RPV water level. 2 1

RC/L-1 Initiate each of the following which should have initiated did not:

- Isolation
- ECCS
- [• Emergency diesel generator]

DEVIATIONS

The reference to caution #2 was deleted.

See Caution #2 discussion of deviation.

EOP VARIANCE

The plant specific EOP support procedure reference for verifying isolation is added to the flowchart.

NMP2 PSTG STEP

If while executing the following step:

- Any control rod cannot be determined to be inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* and it has not been determined that the reactor will remain shutdown under all conditions without boron, enter Contingency #5.
- RPV water level cannot be determined, enter Contingency #4.

BWROG EPG STEP

If while executing the following step:

- Any control rod cannot be determined to be inserted to or beyond position [02 (Maximum Subcritical Banked Withdrawal Position)] and it has not been determined that the reactor will remain shutdown under all conditions without boron, enter [procedure developed from Contingency #5].
- RPV water level cannot be determined, enter [procedure developed from Contingency #4].

DEVIATIONS

None.

EOP VARIANCE

The wording of the first bullet item was simplified to enhance ease of use in the flowchart.

Appendix A. Section: RPV Control

NMP2 PSTG STEP

If while executing the following step primary containment water level and suppression chamber pressure cannot be maintained below the Maximum Primary Containment Water Level Limit, then irrespective of whether adequate core cooling is assured terminate injection into the Primary Containment from sources external to the primary containment until primary containment water level and suppression chamber pressure can be maintained below the Maximum Primary Containment Water Level Limit.

BWROG EPG STEP

If while executing the following step primary containment water level and suppression chamber pressure cannot be maintained below the Maximum Primary Containment Water Level Limit, then irrespective of whether adequate core cooling is assured terminate injection into the RPV from sources external to the primary containment until primary containment water level and suppression chamber pressure can be maintained below the Maximum Primary Containment Water Level Limit.

Appendix A. Section: RPV Control

DEVIATIONS

- "Terminate injection into the RPV" was replaced with "Terminate injection into the Primary Containment".

  In accordance with the BWROG EPG Issues Resolution File No. 8903.

EOP VARIANCE

- The words "Maximum Primary Containment Water Level Limit" at the end of the override were replaced with "curve" in the flowchart for simplification.

- Where values are specified in the MPCWLL figure at break points they were rounded in the conservative direction to be consistent with control room instrument readability.

NMP2 PSTG STEP

RC/L-2 Restore and maintain RPV water level between 159.3 in. *(low level scram setpoint / shutdown cooling RPV water level interlock)* and 202.3 in. *(high level trip setpoint)* with one or more of the following systems:

- Condensate/Feedwater
- CRD
- RCIC with suction from the condensate storage tank, if available defeating low RPV pressure isolation interlocks if necessary. 3 4
- HPCS; control and maintain pump flow less than the HPCS Vortex Limit. 5
- LPCS; control and maintain pump flow less than the LPCS Pump NPSH Limit and the LPCS Vortex Limit.
- LPCI with injection through the heat exchangers as soon as possible; control and maintain pump flow less than the RHR Pump NPSH Limit and the RHR Vortex Limit.

BWROG EPG STEP

RC/L-2 Restore and maintain RPV water level between [+12 in. (low level scram setpoint or shutdown cooling RPV water level interlock, whichever is higher)] and [+58 in. (high level trip setpoint)] with one or more of the following systems:

- Condensate/feedwater
- CRD
- RCIC with suction from the condensate storage tank, defeating low RPV pressure isolation interlocks and high suppression pool water level suction transfer logic if necessary. 3 4
- HPCI with suction from the condensate storage tank, defeating high suppression pool water level suction transfer logic if necessary.
- HPCS; control and maintain pump flow less than [the HPCS Vortex Limit]. 5
- LPCS; control and maintain pump flow less than the LPCS Pump NPSH Limit and [the LPCS Vortex Limit].
- LPCI with injection through the heat exchangers as soon as possible; control and maintain pump flow less than the RHR Pump NPSH Limit and [the RHR Vortex Limit].

DEVIATIONS

- The words "if available" were added to the direction concerning RCIC operation.

  This is a partial incorporation of BWROG EPG Issues Resolution File No. 8905.

- HPCI was deleted from the list of injection systems, as well as the associated caution.

  NMP2 does not have a HPCI system.

- The figures HPCS Vortex Limit, LPCS Vortex Limit, and RHR Vortex Limit were truncated at plant El. 192 ft.

  The range of suppression pool water level instrumentation does not extend down to the calculated end point of the HPCS, LPCS, and RHR Vortex Limit curves. The curves are therefore truncated at the lowest instrumented suppression pool water level. Although the actual margin to these limits is wider, this truncation provides conservatism in regard to prolonging availability of ECCS pumps.

- The figures HPCS Vortex Limit, LPCS Vortex Limit, and RHS Vortex Limit use El. ft. on the vertical axis instead of ft.

  NMP2 containment level instruments read in El. ft. referenced to sea level elevation. These values correspond to the calculated values for suppression pool level.

- The words "or" and "whichever is higher" were deleted.

  At NMP2 both the low level scram setpoint and the shutdown cooling RPV water level interlock are at 159.3 in.

(continued next page)

DEVIATIONS (Continued from previous page)

- The words "and high suppression pool water level suction transfer logic" were deleted.

  At NMP2 RCIC does not have high suppression pool water level suction transfer logic. (reference: Technical Specification 3/4.3.5).

EOP VARIANCE

- References to plant specific support procedures were added to the flowcharts to assist the operators.

- Break point values on ECCS pump vortex limits were rounded in the conservative direction to be consistent with control room instrument readability.

Appendix A. Section: RPV Control

NMP2 PSTG STEP

If RPV water level cannot be restored and maintained above 159.3 in. *(low level scram setpoint ~~or~~ shutdown cooling RPV water level interlock~~, whichever is higher~~)*, maintain RPV water level above -14.4 in. *(top of active fuel)*.

BWROG EPG STEP

If RPV water level cannot be restored and maintained above[+12 in. (low level scram setpoint or shutdown cooling RPV water level interlock, whichever is higher)], maintain RPV water level above [-164 in. (top of active fuel)].

DEVIATIONS

The words "or" and "whichever is higher" were deleted.

At NMP2 both the low level scram setpoint and the shutdown cooling RPV water level interlock are at 159.3 in.

EOP VARIANCE

None.

NMP2 PSTG STEP

RPV water level control may be augmented by one or more of the following systems:

- RHR service water crosstie
- Fire system
- ECCS keep-full systems
- SLC (test tank)
- SLC (boron tank)
- Condensate Transfer

BWROG EPG STEP

RPV water level control may be augmented by one or more of the following systems:

[• RHR service water crosstie]

[• Fire system]

[• Interconnections with other units]

[• ECCS keep-full systems]

[• SLC (test tank)]

[• SLC (boron tank)]

DEVIATIONS

- "Interconnections with other units" was deleted.

  NMP2 has no interconnections with other units other than the fire system which is already listed.

- "Condensate Transfer" is added to the list.

  At NMP2, condensate transfer is an additional source of water available for RPV injection, and therefore added to the list.

EOP VARIANCE

References to plant specific support procedures were added to the flowcharts to assist the operators.

Appendix A. Section: RPV Control

NMP2 PSTG STEP

If RPV water level can be maintained above -14.4 in. *(top of active fuel)* and the ADS timer has initiated, place the ADS logic inhibit switches in ON.

BWROG EPG STEP

If RPV water level can be maintained above [-164 in. (top of active fuel)] and the ADS timer has initiated, prevent automatic RPV depressurization by resetting the ADS timer.

DEVIATIONS

"prevent automatic RPV depressurization by resetting the ADS timer" was replaced with "place the ADS logic inhibit switches in ON.

Placing the ADS logic inhibit switches in ON is the NMP2 methodology to prevent automatic initiation of ADS. The direction to prevent automatic initiation of ADS is in accordance with the BWROG EPG Issues Resolution File No. 8906.

EOP VARIANCE

The words "If RPV water level can be maintained above -14.4 in" were deleted in the flowchart for simplicity. If water level cannot be maintained above TAF, the operators would enter C1 and not even be in this procedure. Therefore, these words are not required.

Appendix A. Section: RPV Control

NMP2 PSTG STEP

If RPV water level cannot be maintained above -14.4 in. *(top of active fuel)*, enter Contingency #1.

BWROG EPG STEP

If RPV water level cannot be maintained above [-164 in. (top of active fuel)], enter procedure developed from Contingency #1.

DEVIATIONS

None.

EOP VARIANCE

None.

Appendix A. Section: RPV Control

procedure for cooldown to cold shutdown conditions.

NMP2 PSTG STEP

RC/L-3 When ~~OP-101C~~ is entered from Step RC/P-5, proceed to cold shutdown in accordance with ~~OP-101C.~~

BWROG EPG STEP

RC/L-3 When [procedure for cooldown to cold shutdown conditions] is entered from [Step RC/P-5], proceed to cold shutdown in accordance with [procedure for cooldown to cold shutdown conditions].

DEVIATIONS

"OP-101C" replaces "procedures for cooldown to cold shutdown conditions".

NMP2 procedure for cooldown is OP-101C.

EOP VARIANCE

None.

NMP2 PSTG STEP

RC/P Monitor and control RPV pressure.

If while executing the following steps:

- A high drywell pressure ECCS initiation signal (1.68 psig) *(drywell pressure which initiates ECCS)* exists, prevent injection from those LPCS and LPCI pumps not required to assure adequate core cooling prior to depressurizing below their maximum injection pressures.
- Emergency RPV depressurization is anticipated and either all control rods are inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* or it has been determined that the reactor will remain shutdown under all conditions without boron, rapidly depressurize the RPV with the main turbine bypass valves.
- Emergency RPV depressurization is required and less than 7 *(number of SRVs dedicated to ADS)* SRVs are open, enter Contingency #2.
- RPV water level cannot be determined and less than 7 *(number of SRVs dedicated to ADS)* SRVs are open, enter Contingency #2.
- RPV water level cannot be determined and at least 7 *(number of SRVs dedicated to ADS)* SRVs are open, enter Contingency #4.

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BWROG EPG STEP

RC/P Monitor and control RPV pressure.

If while executing the following steps:

- A high drywell pressure ECCS initiation signal ([2.0 psig (drywell pressure which initiates ECCS)]) exists, prevent injection from those LPCS and LPCI pumps not required to assure adequate core cooling prior to depressurizing below their maximum injection pressures.
- Emergency RPV Depressurization is anticipated and either all control rods are inserted to or beyond position [02 (Maximum Subcritical Banked Withdrawal Position)] or it has been determined that the reactor will remain shutdown under all conditions without boron, rapidly depressurize the RPV with the main turbine bypass valves. 6 2
- Emergency RPV Depressurization is required and less than [7 (number of SRVs dedicated to ADS)] SRVs are open, enter [procedure developed from Contingency #2].
- RPV water level cannot be determined and less than [7 (number of SRVs dedicated to ADS)] SRVs are open, enter [procedure developed from Contingency #2].
- RPV water level cannot be determined and at least [7 (number of SRVs dedicated to ADS)] SRVs are open, enter [procedure developed from Contingency #4].

DEVIATIONS

- The reference to Caution #2 was deleted.

  See Caution #2 deviation.

- The words "procedure developed from" were omitted.

  Contingency #4 is the EOP procedure developed from Contingency #4.

EOP VARIANCE

- In the section where emergency depressurization is anticipated, the words were simplified to facilitate easier use of the flowchart.

- Caution #6 is incorporated directly into the step to clarify the intent and to ensure that the emphasis is not shifted away from the primary direction of this step.

NMP2 PSTG STEP

RC/P-1 If any SRV is cycling, manually open SRVs until RPV pressure drops to 960 psig *(RPV pressure at which all turbine bypass valves are fully open).*

BWROG EPG STEP

RC/P-1 If any SRV is cycling, initiate IC and manually open SRVs until RPV pressure drops to [935 psig (RPV pressure at which all turbine bypass valves are fully open)].

DEVIATIONS

The direction to initiate IC was deleted.

NMP2 does not have an IC.

EOP VARIANCE

None.

NMP2 PSTG STEP

If while executing the following steps:

- Suppression pool temperature cannot be maintained below the Heat Capacity Temperature Limit, maintain RPV pressure below the limit 6
- Suppression pool water level cannot be maintained below the SRV Tail Pipe Level Limit, maintain RPV pressure below the limit. 6
- Steam Cooling is required, enter Contingency #3.

BWROG EPG STEP

If while executing the following steps:

- Suppression pool temperature cannot be maintained below the Heat Capacity Temperature Limit, maintain RPV pressure below the limit
- Suppression pool water level cannot be maintained below the SRV Tail Pipe Level Limit, maintain RPV pressure below the limit.
- Steam Cooling is required, enter procedure developed from Contingency #3.

6

6

DEVIATIONS

- The figure SRV Tail Pipe Level Limit was truncated at plant El. 217 ft.

  The range of suppression pool water level instrumentation does not extend up to the calculated end point of the SRV Tail Pipe Level Limit curve. The curve is therefore truncated at the highest instrumented suppression pool water level. El. 217 ft. is the elevation of the highest instrumented suppression pool water level. Although the actual margin to the SRV Tail Pipe Level Limit may be wider, this truncation provides conservatism in regard to SRV and containment damage.

- The words "procedure developed from" were omitted.

  Contingency #3 is the EOP procedure developed from Contingency #3.

EOP VARIANCE

- The word "curve" replaces the word "limit" in two places. This provides consistency between the flowchart sections.

- Caution #6 is incorporated directly into the step to clarify the intent and to ensure that the emphasis is not shifted away from the primary direction of this step.

- Values specified at break points of the STPLL were rounded in the conservative direction to be consistent with readability of control room instruments.

NMP2 PSTG STEP

If while executing the following steps:

- Boron injection is required, and
- The main condenser is available, and
- There has been no indication of gross fuel failure or steam line break,

open MSIVs, bypassing IAS and low RPV water level MSIV isolation interlocks if necessary, to re-establish the main condenser as a heat sink (OP-1, Section H.1).

BWROG EPG STEP

If while executing the following steps:

- Boron injection is required, and
- The main condenser is available, and
- There has been no indication of gross fuel failure or steam line break,

open MSIVs, bypassing pneumatic system and low RPV water level isolation interlocks if necessary, to re-establish the main condenser as a heat sink.

DEVIATIONS

- The words "pneumatic system" were replaced by "IAS".

  Plant specific terminology.

- The word "MSIV" was added.

  In order to clarify the intent that defeating low RPV water level interlocks is authorized only for opening the MSIVs.

EOP VARIANCE

- The words "(or prevent MSIV closure was added to the flowchart. This is consistent with actions of C5 Level/Power Control which would be performed concurrently with this procedure.

- Plant specific references to support procedures were added in order to facilitate their use.

- The flowchart uses the word "defeat" in reference to RPV water level interlocks. This has no impact on the procedure's use. This maintains consistency between the methods used to perform this function and the definition of the word "defeat".

NMP2 PSTG STEP

RC/P-2 Stabilize RPV pressure at a pressure below 1037 psig *(high RPV pressure scram setpoint)* with the main turbine bypass valves.

BWROG EPG STEP

RC/P-2 Stabilize RPV pressure at a pressure below [1045 psig (high RPV pressure scram setpoint)] with the main turbine bypass valves.

DEVIATIONS

None.

EOP VARIANCE

None.

NMP2 PSTG STEP

RPV pressure control may be augmented by one or more of the following systems:

- SRVs only when suppression pool water level is above El. 192 ft *(lowest instrumented suppression pool water level)*; open SRVs in the following sequence, if possible: PSV-128, 133, 123, 124, 136, 131, 122, 120, 132, 125, 121, 135, 126, 130, 127, 129, 137, 134 (SRV opening sequence), defeat pneumatic system interlocks if necessary; if the continuous SRV pneumatic supply is or becomes unavailable, place the control switch for each SRV in the AUTO position.
- RCIC with suction from the condensate storage tank, if available. 3 4
- RHR in the steam condensing mode.
- RWCU (recirculation mode), bypassing filter/demineralizers and, if necessary, defeating SLC and other isolation interlocks.
- Main steam line drains.
- RWCU (blowdown mode) if no boron has been injected into the RPV. Refer to sampling procedure, prior to initiating blowdown.

BWROG EPG STEP

RPV pressure control may be augmented by one or more of the following systems:

- IC
- SRVs only when suppression pool water level is above [4 ft. 9 in. (elevation of top of SRV discharge device)]; open SRVs in the following sequence if possible: [M, B, G, F, D, L, K, C, A (SRV opening sequence)]; if the continuous SRV pneumatic supply is or becomes unavailable, place the control switch for each SRV in the [CLOSE or AUTO] position.
- HPCI with suction from the condensate storage tank.
- RCIC with suction from the condensate storage tank. 3 4
- [Other steam driven equipment]
- RWCU (recirculation mode), bypassing [regenerative heat exchangers and] filter/demineralizers and, if necessary, defeating SLC and other isolation interlocks.
- Main steam line drains
- RWCU (blowdown mode) if no boron has been injected into the RPV; refer to [sampling procedures] prior to initiating blowdown.

DEVIATIONS

- The words "if available were added to the direction concerning RCIC operation.

  This is partial incorporation of BWROG EPG Issues Resolution File No. 8905.

- The option to augment RPV pressure by IC was deleted.

  NMP2 does not have an IC.

- "Elevation of top of SRV discharge device" was replaced with "lowest instrumented suppression pool water level".

  The range of Suppression Pool level instrumentation does not extend down to the elevation of the top of the SRV discharge device. Although the actual margin may be wider, this conservative substitute eliminates the risk of discharging the SRVs into the suppression chamber air space.

- The option to augment RPV pressure by HPCI was deleted.

  NMP2 does not have a HPCI.

- The words "close or" were deleted.

  NMP2 SRV control switch position in Auto closes the respective valve if below the relief function setpoint and retains the capability to automatically open in the relief mode. This meets the intent of BWROG EPG rev. 4 Appendix B (page B-6-78).

(Continued next page)

DEVIATIONS (continued from previous page)

- "RHR in the steam condensing mode" replaces "other steam driven equipment".

  At NMP2, RHR steam condensing is a means of RPV pressure control.

- The words "regenerative heat exchangers, and" were deleted.

  At NMP2, system configuration does not allow bypassing the regenerative heat exchanger only (Reference: P&ID 37B and 37C).

- The words "defeat pneumatic system interlocks if necessary" were added to the direction regarding the opening of SRVs.

  Defeating isolation interlocks for SRV pneumatic supply valves, promotes more stable pressure control if SRVs are being used to stabilize pressure. This also prolongs the availability of the SRVs should they be required for RPV cooldown or RPV emergency depressurization. Post accident condition for these valves (2IAS*SOV164, 165, 166, and 184) is open (USAR Table 6.2-56). In addition, the inboard MSIVs also receive air via the same line as the "C" solenoid supply line to the SRVs. Also see BWROG EPG Open Issue No. 9092 for reference.

EOP VARIANCE

- The words "if necessary" were added to the flowchart to clarify the intent.
- Plant procedure references were added to the flowchart to facilitate its use.
- The phrase "refer to sampling procedures" were rewritten to clarify the intent of this step.
- Plant specific valve numbers were added to the flowchart to identify the pneumatic supply valves to the SRVs.

NMP2 PSTG STEP

> If while executing the following steps the reactor is not shutdown, return to Step RC/P-2

BWROG EPG STEP

> If while executing the following steps the reactor is not shutdown, return to [Step RC/P-2].

DEVIATIONS

None.

EOP VARIANCE

This step follows the "wait" statement for which the conditions must be met to commence cooldown. This places the override directly prior to the step at which it is applicable. This is better placement since the wait statement and action statements are broken up into two flowchart elements in the EOPs.

NMP2 PSTG STEP

RC/P-3 When either:

- All control rods are inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)*, or
- It has been determined that the reactor will remain shutdown under all conditions without boron, or
- 769 pounds *(cold shutdown boron weight)* of boron have been injected into the RPV, or
- The reactor is shutdown and no boron has been injected into the RPV,

depressurize the RPV and maintain cooldown rate below 100°F/hr *(RPV cooldown rate LCO)*.

If one or more SRVs are being used to depressurize the RPV and the continuous SRV pneumatic supply is or becomes unavailable, depressurize with sustained SRV opening.

BWROG EPG STEP

RC/P-3 When either:

- *All control rods are inserted to or beyond position [02 (Maximum Subcritical Banked Withdrawal Position)], or*
- *It has been determined that the reactor will remain shutdown under all conditions without boron, or*
- *[700 pounds (Cold Shutdown Boron Weight)] of boron have been injected into the RPV, or*
- *The reactor is shutdown and no boron has been injected into the RPV,*

depressurize the RPV and maintain cooldown rate below [100°F/hr (RPV cooldown rate LCO)].

If one or more SRVs are being used to depressurize the RPV and the continuous SRV pneumatic supply is or becomes unavailable, depressurize with sustained SRV opening.

DEVIATIONS

None.

EOP VARIANCE

- The words concerning control rods and boron were simplified to facilitate ease of use.

- The flowchart specifies an SLS tank level of 900 gallons remaining in the SLS tank which corresponds to 769 pounds of boron injected to achieve cold shutdown boron weight. The cold shutdown boron weight is also specified should boron injection be required using other than the SLC tank (RWCU injection).

- The words "into the RPV were omitted from the flowchart for simplification.

NMP2 PSTG STEP

RC/P-4 When the shutdown cooling RPV pressure interlock clears, and either all control rods are inserted to position 02 or it has been determined that the reactor will remain shutdown under all conditions without boron, initiate shutdown cooling using only those RHR pumps not required to maintain RPV water level above 159.3 in. *(RPV water level shutdown cooling interlock)* by operation in the LPCI mode.

If shutdown cooling cannot be established and further cooldown is required, continue to cool down using one or more of the systems used for depressurization.

BWROG EPG STEP

RC/P-4 When the shutdown cooling RPV pressure interlock clears, initiate shutdown cooling [using only those RHR pumps not required to maintain RPV water level above [10 in. (RPV water level shutdown cooling interlock)] by operation in the LPCI mode].

If shutdown cooling cannot be established and further cooldown is required, continue to cool down using one or more of the systems used for depressurization.

DEVIATIONS

The words "and either all control rods are inserted to position 02 or it has been determined that the reactor will remain shutdown under all conditions without boron," were added.

Addition of the requirement to be shutdown on control rods ensures that SDC will not be placed in service while the potential for criticality still exists. Placing SDC in service has the potential to sweep boron from the core region causing the reactor to regain criticality. BWROG EPG C5 does not allow recovery of RPV water level for those plants which inject SLS within the core region due to the potential for sweeping boron from the core. This is unlike those plants which inject SLS under the core region as recovery of RPV level would tend to shutdown the reactor. Initiating SDC will effectively perform the same function as recovery of RPV water level and should not be done until the reactor is shutdown on control rods. (Related to EPG Issues Resolution File Nos. 8907 and 8937)

EOP VARIANCE

- The words concerning control rods were simplified.

- Plant specific procedure reference was added to the flowchart to facilitate ease of use.

NMP2 PSTG STEP

RC/P-5 Proceed to cold shutdown in accordance with ~~OP-101C.~~ procedure for cooldown to cold shutdown conditions.

BWROG EPG STEP

RC/P-5 When either:

- All control rods are inserted to or beyond position [02 (Maximum Subcritical Banked Withdrawal Position)], or
- It has been determined that the reactor will remain shutdown under all conditions without boron, or
- [700 pounds (Cold Shutdown Boron Weight)] of boron have been injected into the RPV, proceed to cold shutdown in accordance with [procedure for cooldown to cold shutdown conditions].

DEVIATIONS

"OP-101C" replaced "procedure for cooldown to cold shutdown conditions".

At NMP2 OP-101C is the procedure for cooldown to cold shutdown conditions.

Conditional statements of RC/P-5 were deleted.

The conditions specified in the EPG were previously met and he reactor is not shutdown on control rods. Refer also to the discussion on RC/P-4. (Related to EPG Issues Resolution File Nos. 8907 and 8937).

EOP VARIANCE

~~None.~~

NMP2 PSTG STEP

RC/Q Monitor and control reactor power.

If while executing the following steps:

- All control rods are inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)*, terminate boron injection and enter ~~OP-101C, Section H.1~~. Scram procedure.
- It has been determined that the reactor will remain shutdown under all conditions without boron, terminate boron injection and enter ~~OP-101C, Section H.1.~~ scram procedure.

BWROG EPG STEP

RC/Q Monitor and control reactor power.

If while executing the following steps:

- All control rods are inserted to or beyond position 02 [(Maximum Subcritical Banked Withdrawal Position)], terminate boron injection and enter [scram procedure].
- It has been determined that the reactor will remain shutdown under all conditions without boron, terminate boron injection and enter [scram procedure].
- The reactor is shutdown and no boron has been injected into the RPV, enter [scram procedure].

Appendix A, Section: RPV Control

DEVIATIONS

"OP-101C, Section H.1" replaced "scram procedure".

At NMP2 OP-101C, Section H.1 is the scram procedure.

The third condition was deleted.

Deletion of this step precludes premature exit from section RQ to the scram procedure which is not written to address the conditions during which the reactor could become critical. This also enables continued use of alternate control rod insertion methods as authorized by section RQ and prevents conflicting actions between the EOPs and the scram procedure.

EOP VARIANCE

The words regarding control rods and boron were simplified for ease of use.

NMP2 PSTG STEP

RC/Q-1 Confirm or place the reactor mode switch in shutdown.

RC/Q-2 If ARI has not initiated, initiate RRCS.

RC/Q-3 If the main turbine-generator is on-line and the MSIVs are open, confirm or initiate recirculation flow runback to minimum.

RC/Q-4 If reactor power is above 4% *(APRM downscale trip)* or cannot be determined, trip the recirculation pumps.

BWROG EPG STEP

RC/Q-1 [Confirm or place the reactor mode switch in SHUTDOWN.]

RC/Q-2 [If ARI has not initiated, initiate ARI.]

RC/Q-3 If the main turbine-generator is on-line [and the MSIVs are open], confirm or initiate recirculation flow runback to minimum.

RC/Q-4 If reactor power is above [3% (APRM downscale trip)] or cannot be determined, trip the recirculation pumps.

DEVIATIONS

- In RC/Q-4 "ARI" was replaced with "RRCS".

  Initiating RRCS accomplishes the ARI function (reference USAR 15.8.3.2)

- EPG Step RC/Q-5 was deleted.

  Initiating RRCS accomplishes the ARI function but does not cause a trip of the recirculating water pumps. This resulted in retaining Step RC/Q-2 and deleting Step RC/Q-5 since the action is already accomplished. This is consistent with BWROG EPG rev. 4 Appendix B.

EOP VARIANCE

- Plant specific procedure reference is provided in the flowchart for RRCS initiation to facilitate use.

- The words "confirm or place" were replaced with "verify". This simplifies the statement, means the same, and consistent with NUREG/CR 5228 Section 13.2.1 and N2-EOP-5.

- The decision steps for 'turbine generator on line' and 'MSIVs open' are reversed in the flowchart. This has no impact on the logic of this procedure, however, it facilitates procedure use as operators can easily realize that the MSIVs are closed. This will also make the procedure easier to follow since the question about the turbine generator may be bypassed.

NMP2 PSTG STEP

> Execute Steps RC/Q-5 and RC/Q-6 concurrently.

RC/Q-5 Before suppression pool temperature reaches the Boron Injection Initiation Temperature but only if the reactor cannot be shut down, BORON INJECTION IS REQUIRED; inject boron into the RPV with SLC and place the ADS logic inhibit switches in ON.

If boron cannot be injected with SLC, inject boron into the RPV using one or more of the following alternate methods:

- Hydro pump
- RWCU

BWROG EPG STEP

RC/Q-5 [If ARI has not initiated, initiate ARI.]

> Execute [Steps RC/Q-6 and RC/Q-7] concurrently.

RC/Q-6 Before suppression pool temperature reaches [the Boron Injection Initiation Temperature] but only if the reactor cannot be shut down, BORON INJECTION IS REQUIRED; inject boron into the RPV with SLC and prevent automatic initiation of ADS.

If boron cannot be injected with SLC, inject boron into the RPV by one or more of the following alternate methods:

[• CRD]
[• HPCS]
[• RWCU]
[• Feedwater]
[• HPCI]
[• RCIC]
[• Hydro Pump]

Appendix A. Section: RPV Control

DEVIATIONS

- "prevent automatic initiation of ADS" was replaced with "place the ADS logic inhibit switches in ON."

  Placing the ADS logic inhibit switches in ON is the NMP2 methodology to prevent automatic initiation of ADS.

- RC/Q-5 and RC/Q-6 replace RC/Q-6 and RC/Q-7.

  EPG Step RC/Q-5 was deleted from the PSTG, therefore the numbering sequence does not match.

- "CRD, HPCS, Feedwater, HPCI, and RCIC" were not included as alternate methods for boron injection.

  At NMP2, the hydro pump and RWCU are alternate methods for boron injection.

EOP VARIANCE

- The BIIT curve was replaced with one value, 110°F. This was done for the following reasons:
  1. To simplify the use of the procedure since it is intended to be thermal power (decay heat and fission heat) and not APRM power.
  2. Although it does not provide for maximum flexibility, it is conservative.
  3. It is consistent with technical specification 3.6.2.1 action b.2.b.

- Plant specific procedure reference was added to the flowchart to facilitate its use.

NMP2 PSTG STEP

> If while executing the following steps SLC tank water level drops to 0 gal *(low SLC tank water level trip)*, confirm automatic trip of or manually trip the SLC pumps.

RC/Q-5.1 If boron is not being injected into the RPV by RWCU and RWCU is not isolated, bypass filter/demineralizers.

RC/Q-5.2 When all control rods are inserted to or beyond position 02, or it has been determined that the reactor will remain shutdown under all conditions without boron, enter ~~OP-101C, Section H.1.~~ scram procedure.

BWROG EPG STEP

> If while executing the following steps SLC tank water level drops to [0% (low SLC tank water level trip)], confirm automatic trip of or manually trip the SLC pumps.

RC/Q-6.1 If boron is not being injected into the RPV by RWCU and RWCU is not isolated, bypass [regenerative heat exchangers and] filter/demineralizers.

RC/Q-6.2 Continue to inject boron until [700 pounds (Cold Shutdown Boron Weight)] of boron have been injected into the RPV.

RC/Q-6.3 Enter [scram procedure].

Appendix A. Section: RPV Control

DEVIATIONS

- Step numbers do not agree.

  Refer to discussion on step RC/Q-5.

- 0 gallons replaced 0%.

  At NMP2, SLS tank level instruments read in gallons.

- The words "regenerative heat exchangers and" were deleted.

  At NMP2, system configurations does not allow bypassing the regenerative heat exchanger only. Reference: P&ID 37B and 37C.

- ~~"OP-101C Section H.1, replaced "scram procedure".~~

  ~~At NMP2, OP-101C is the scram procedure.~~

Move to EOP variances

(Continued next page)

DEVIATIONS (continued from previous page)

- The words "Continue to inject boron until [700 pounds (cold shutdown boron weight)] of boron have been injected into the RPV" were replaced with "when all control rods are injected to or beyond position 02, or it has been determined that the reactor will remain shutdown under all conditions without boron".

This will ensure that the procedure is Not prematurely exited when the reactor is shutdown on boron alone. For NMP2, it is not appropriate to exit to the scram procedure when the reactor is not shutdown on control rods. This is due to plant design which injects SLS inside the core. When the reactor is shutdown on boron alone, procedure C5, Power/Level Control addresses control of reactor water level. Exiting to the scram procedure at this point will yield conflicting actions with regard to level and pressure control functions. In addition, remaining in RPV Control, Section RC/Q, enables continued use of alternate control rod insertion methods. The CSD boron weight is not used to determine that boron injection should stop, but only as a point where the scram procedure should be entered. Boron injection will continue until either SLC tank level drops to 0 gallons, or a sufficient number of control rods are inserted such that the reactor will remain shutdown under all conditions without boron. (Related to EPG Issues Resolution File Nos. 8907 and 8937.

EOP VARIANCE

- The words "confirm...... or manually" were replaced with "verify". This makes the statement simpler, means the same, and consistent with both N2-EOP-5 and NUREG/CR 5228 paragraph 13.2.1.

- PSTG Step RC/Q-5.1 was expanded in the flowchart to allow isolation of the system should RWCU is not required to support the RPV pressure control or boron injection function. This provides greater flexibility and still meets the intent of EPG Appendix B. Isolating the system is significantly simpler than bypassing filter / demineralizers and is consistent with the scram procedure (due to feedwater stratification concerns identified during NMP2 startup and test phase).

- Wording of the flowchart statement in regard to control rods and boron were simplified.

- The step "Terminate boron injection" is added to be consistent with section RQ override (override prior to PSTG Step RC/Q-1).

~~Add variance of OP101C (p. 56)~~

- OP-101C Section H.1 replaces "scram procedure". At NMP2 OP101C Section H.1 is the scram procedure.

NMP2 PSTG STEP

RC/Q-6 Insert control rods as follows:

RC/Q-6.1 Reset ARI, defeating ARI logic trips if necessary.

RC/Q-6.2 Insert control rods with one or more of the following methods:

- De-energize scram solenoids
- Vent the scram air header
- Reset the scram, defeating RPS logic trips if necessary, drain the scram discharge volume, and initiate a manual scram
- Open individual scram test switches
- Drive control rods, defeating RSCS and RWM interlocks if necessary
- Vent control rod drive overpiston volumes

BWROG EPG STEP

RC/Q-7 Insert control rods as follows:

RC/Q-7.1 Reset ARI, defeating ARI logic trips if necessary.

RC/Q-7.2 Insert control rods with one or more of the following methods:

- De-energize scram solenoids
- Vent the scram air header
- Reset the scram, defeating RPS logic trips if necessary, drain the scram discharge volume, and initiate a manual scram
- Open individual scram test switches
- Increase CRD cooling water differential pressure
- Drive control rods, defeating RSCS and RWM interlocks if necessary
- Vent control rod drive overpiston volumes

Appendix A. Section: RPV Control

DEVIATIONS

- The option to insert control rods by increasing CRD cooling water differential pressure was deleted.

  This option is not possible at NMP2. No cooling water PCV exists. Reference P&ID 30B.

- Step numbering does not agree.

  Refer to discussion on Step RC/Q-5.

EOP VARIANCE

- Provided reference for a plant specific procedure for defeating ARI logic trips and alternate control rod insertion methods. This was done to facilitate the use of the procedures.

- Reset ARI is incorporated into the step specifying inserting control rods since it is an integral part of the EOP support procedure. Also, the EOP step is structured similar to N2-EOP-6, Attachment 14.

NMP2 PSTG STEP

PURPOSE

The purpose of this guideline is to:

- Maintain primary containment integrity, and
- Protect equipment in the primary containment.

BWROG EPG STEP

PURPOSE

The purpose of this guideline is to:

Maintain primary containment integrity, and

Protect equipment in the primary containment.

DEVIATIONS

None.

EOP VARIANCE

The purpose is not included in the flowchart. This is considered a training item and not required as a procedure note or step.

NMP2 PSTG STEP

ENTRY CONDITIONS

The entry conditions for this guideline are any of the following:

- Suppression pool temperature above 90°F *(most limiting suppression pool temperature LCO)*
- Drywell temperature above 150°F *(drywell temperature LCO or maximum normal operating temperature, whichever is higher)*
- Drywell pressure above 1.68 psig *(high drywell pressure scram setpoint)*
- Suppression pool water level above El. 201 ft *(Maximum suppression pool water level LCO)*
- Suppression pool water level below El. 199.5 ft *(minimum suppression pool water level LCO)*
- Primary containment hydrogen concentration above 1.8% *(high hydrogen alarm setpoint)*

BWROG EPG STEP

ENTRY CONDITIONS

The entry conditions for this guideline are any of the following:

- Suppression pool temperature above [95°F (most limiting suppression pool temperature LCO)]
- Drywell temperature above [135°F (drywell temperature LCO or maximum normal operating temperature, whichever is higher)]
- Containment temperature above [90°F (containment temperature LCO)]
- Drywell pressure above [2.0 psig (high drywell pressure scram setpoint)]
- Suppression pool water level above [12 ft 6 in. (maximum suppression pool water level LCO)]
- Suppression pool water level below [12 ft 2 in. (minimum suppression pool water level LCO)]
- Primary containment hydrogen concentration above [2% (high hydrogen alarm setpoint)]

DEVIATIONS

The containment temperature entry condition has been deleted.

This entry condition is applicable only to plants with a Mark III containment. NMP2 has a Mark II containment.

EOP VARIANCE

- The entry conditions are listed in the order corresponding to the sectional arrangement of the EOP to enhance procedure use.
- Values given at break points in the figures were rounded in the conservative direction to be consistent with control room instrument readability.

NMP2 PSTG STEP

OPERATOR ACTIONS

> Irrespective of the entry conditions, execute Steps SP/T, DW/T, PC/P, SP/L, and PC/H concurrently.

BWROG EPG STEP

> Irrespective of the entry conditions, execute [Steps SP/T, DW/T, CN/T, PC/P, SP/L and PC/H] concurrently.

DEVIATIONS

The reference to Section CN/T was deleted.

This section applies only to plants with Mark III containment. NMP2 has a Mark II containment.

EOP VARIANCE

The flowchart contains an additional step regarding the emergency plan. This reminds the operators that activation of the emergency plan may be required.

NMP2 PSTG STEP

SP/T Monitor and control suppression pool temperature below 90°F (most limiting suppression pool temperature LCO) using available suppression pool cooling.

When suppression pool temperature cannot be maintained below 90°F (most limiting suppression pool temperature LCO) :

SP/T-1 Operate all available suppression pool cooling using only those RHR pumps not required to assure adequate core cooling by continuous operation in the LPCI mode.

SP/T-2 Before suppression pool temperature reaches the Boron Injection Initiation Temperature, enter RPV Control at step RC-1 and execute it concurrently with this procedure.

SP/T-3 When suppression pool temperature and RPV pressure cannot be maintained below the Heat Capacity Temperature Limit, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

BWROG EPG STEP

SP/T Monitor and control suppression pool temperature below [95°F (most limiting suppression pool temperature LCO)] using available suppression pool cooling.

When suppression pool temperature cannot be maintained below [95°F (most limiting suppression pool temperature LCO)]:

SP/T-1 Operate all available suppression pool cooling [using only those RHR pumps not required to assure adequate core cooling by continuous operation in the LPCI mode].

SP/T-2 Before suppression pool temperature reaches [the Boron Injection Initiation Temperature], enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure.

SP/T-3 When suppression pool temperature and RPV pressure cannot be maintained below the Heat Capacity Temperature Limit, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

DEVIATIONS

The words "procedure developed from .... guideline" were deleted.

At NMP2, RPV Control is the procedure developed from the RPV control guideline.

EOP VARIANCE

- The BIIT curve was replaced with one value: 110°F. This was done for the following reasons:
  1. To simplify the use of the procedure since it is intended to be thermal power (decay heat and fission heat) and not APRM power.
  2. Although it does not provide for maximum flexibility, it is conservative.
  3. It is consistent with technical specification 3.6.2.1 action b.2.b.

NMP2 PSTG STEP

DW/T Monitor and control drywell temperature below 150°F *(drywell temperature LCO ~~or maximum normal operating temperature, whichever is higher~~)* using available drywell cooling.

BWROG EPG STEP

DW/T Monitor and control drywell temperature below [135°F (drywell temperature LCO or maximum normal operating temperature, whichever is higher)] using available drywell cooling.

DEVIATIONS

None.

EOP VARIANCE

None.

NMP2 PSTG STEP

When drywell temperature cannot be maintained below 150°F *(drywell temperature LCO ~~or maximum normal operating temperature, whichever is higher~~)*:

DW/T-1 Operate all available drywell cooling, defeating isolation interlocks if necessary.

BWROG EPG STEP

When drywell temperature cannot be maintained below [135°F (drywell temperature LCO or maximum normal operating temperature, whichever is higher)]:

DW/T-1 Operate all available drywell cooling, defeating isolation interlocks if necessary.

DEVIATIONS

None.

EOP VARIANCE

Plant specific procedure for restoring drywell cooling was added to the flowchart to enhance its useability.

NMP2 PSTG STEP

If while executing the following steps drywell sprays have been initiated and drywell pressure drops below 1.68 psig *(high drywell pressure scram setpoint)*, terminate drywell sprays.

BWROG EPG STEP

If while executing the following steps drywell sprays have been initiated and drywell pressure drops below [2.0 psig (high drywell pressure scram setpoint)], terminate drywell sprays.

DEVIATIONS

None.

EOP VARIANCE

None.

NMP2 PSTG STEP

DW/T-2 Before drywell temperature reaches 340°F *(maximum temperature at which ADS is qualified ~~or drywell design temperature, whichever is lower~~)* but only if suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)* and drywell temperature and pressure are within the drywell spray initiation pressure limit, shut down recirculation pumps and drywell cooling fans and initiate drywell sprays, using only those pumps not required to assure adequate core cooling by continuous injection.

BWROG EPG STEP

DW/T-2 Before drywell temperature reaches [340°F (maximum temperature at which ADS qualified or drywell design temperature, whichever is lower)] but only if [suppression pool water level is below [17 ft 2 in. (elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water)] and] drywell temperature and pressure are within the Drywell Spray Initiation Limits, [shut down recirculation pumps and drywell cooling fans and] initiate drywell sprays [using only those RHR pumps not required to assure adequate core cooling by continuous operation in the LPCI mode].

DEVIATIONS

- The words "elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water" were replaced by "highest instrumented suppression pool water level".

  The range of suppression pool water level instrumentation does not extend up to the "elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water". Although the actual margin may be wider, this conservative substitute will eliminate the possibility of operation of drywell sprays while the vacuum breakers are inoperable. Such operation may cause the containment differential pressure capability to be exceeded. El. 217 ft. is the highest instrumented suppression pool water level.

- The Drywell Spray Initiation Pressure Limit curve was truncated at 350°F.

  Although the actual margin may be wider, the curve was conservatively truncated at 350°F since the indicating range of the suppression chamber temperature instrumentation does not extend past this value.

- The word "is" was added.

  This was done for clarity.

- The words "RHR" and "operation in the LPCI mode were deleted. The word "injection was added.

  In accordance with BWROG EPG ISSUES RESOLUTION FILE 8923 which provides for use of pumps other than RHR for containment sprays.

EOP VARIANCE

- The words "drywell cooling fans" were replaced with "drywell unit coolers". This terminology is used throughout this procedure since NMP2's drywell cooling fans are called drywell unit coolers.

- A plant specific reference for initiating drywell sprays was added.

NMP2 PSTG STEP

DW/T-3 When drywell temperature cannot be maintained below 340°F *(maximum temperature at which ADS is qualified ~~or drywell design temperature, whichever is lower~~)*, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter RPV Control at step RC-1 and execute it concurrently with this procedure.

BWROG EPG STEP

DW/T-3 When drywell temperature cannot be maintained below [340°F (maximum temperature at which ADS qualified or drywell design temperature, whichever is lower)], EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure.

DEVIATIONS

The word "is" was added.

This was done for clarity.

EOP VARIANCE

None.

NMP2 PSTG STEP

Not Applicable.

BWROG EPG STEP

CN/T Monitor and control containment temperature below [90°F (containment temperature LCO)], using available containment cooling.

When containment temperature cannot be maintained below [90°F (containment temperature LCO)]:

CN/T-1 Operate all available containment cooling.

> If while executing the following steps suppression pool sprays have been initiated and suppression chamber pressure drops below [2.0 psig (high drywell pressure scram setpoint)], terminate suppression pool sprays.

CN/T-2 Before containment temperature reaches [185°F (containment design temperature)] but only if suppression chamber pressure is above [2.2 psig (Mark III Containment Spray Initiation Pressure Limit)], initiate suppression pool sprays using only those RHR pumps not required to assure adequate core cooling by continuous operation in the LPCI mode..

CN/T-3 When containment temperature cannot be maintained below [185°F (containment design temperature)], EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure.

DEVIATIONS

The CN/T section was deleted.

The CN/T section does not apply to NMP2's Mark II containment. It applies only to BWR plants with Mark III containments.

EOP VARIANCE

None.

NMP2 PSTG STEP

PC/P Monitor and control primary containment pressure below 1.68 psig *(high drywell scram setpoint)* using SBGT. Use SBGT operating procedures.

BWROG EPG STEP

PC/P Monitor and control primary containment pressure below [2.0 psig (high drywell pressure scram setpoint)] using the following systems:

- Containment pressure control systems; use [containment pressure control system operating procedures].
- SBGT [and drywell purge]; use [SBGT and drywell purge operating procedures].

DEVIATIONS

- The use of containment pressure control systems was deleted.

  This does not apply to NMP2's Mark II containment, this applies only to BWR plants with Mark III containments.

- References to drywell purge operating procedures was deleted.

  At NMP2, drywell purge is not utilized to control Primary Containment pressure.

EOP VARIANCE

None.

NMP2 PSTG STEP

When primary containment pressure cannot be maintained below 1.68 psig *(high drywell pressure scram setpoint)*:

> If while executing the following steps suppression pool sprays have been initiated and suppression chamber pressure drops below 1.68 psig *(high drywell pressure scram setpoint)*, terminate suppression pool sprays.

BWROG EPG STEP

When primary containment pressure cannot be maintained below [2.0 psig (high drywell pressure scram setpoint)]:

> If while executing the following steps, suppression pool sprays have been initiated and suppression chamber pressure drops below [2.0 psig (high drywell pressure scram setpoint)], terminate suppression pool sprays.

DEVIATIONS

None.

EOP VARIANCE

"Suppression pool sprays" were replaced with "suppression chamber sprays" for consistency.

NMP2 PSTG STEP

PC/P-1 Before suppression chamber pressure reaches 10.57 psig *(suppression chamber spray initiation pressure)*, but only if suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)* initiate suppression pool sprays using only those pumps not required to assure adequate core cooling by continuous injection.

BWROG EPG STEP

PC/P-1 Before suppression chamber pressure reaches [the Pressure Suppression Pressure] [13.8 psig (Suppression Chamber Spray Initiation Pressure)], but only if [suppression chamber pressure is above 2.2 psig (Mark III Containment Spray Initiation Pressure Limit)] [suppression pool water level is below 24 ft 6 in. (elevation of suppression pool spray nozzles)], initiate suppression pool sprays [using only those RHR pumps not required to assure adequate core cooling by continuous operation in the LPCI mode].

DEVIATIONS

- The direction to initiate suppression pool sprays with the condition "but only if suppression pool water level is below [24 ft. 6 in.] (elevation of suppression pool spray nozzles)" was replaced with "but only if suppression pool water level is below El. 217 ft (highest instrumented suppression pool water level)".

  The range of suppression pool water level instrumentation does not extend up to the level of the suppression spray nozzles. Although the actual margin may be wider, this conservative substitute eliminates the possibility of attempting to spray while the spray nozzles are submerged in the suppression pool. El. 217 ft. is the highest instrumented suppression pool water level.

- References to Mark III Containment Spray Initiation Pressure Limit were deleted.

  NMP2 has a Mark II containment. Reference USAR Section 1.1.

- The words "RHR" and "operation in the LPCI mode were deleted. The word "injection was added.

  In accordance with BWROG EPG ISSUES RESOLUTION FILE 8923 which provides for use of pumps other than RHR for containment sprays.

EOP VARIANCE

- The suppression chamber spray initiation pressure in the flowchart was rounded in the conservative direction to be consistent with control room instrument readability.

- Plant specific procedure reference was added to the flowchart to facilitate its use.

NMP2 PSTG STEP

If while executing the following steps drywell sprays have been initiated and drywell pressure drops below 1.68 psig *(high drywell pressure scram setpoint)*, terminate drywell sprays.

BWROG EPG STEP

If while executing the following steps drywell sprays have been initiated and drywell pressure drops below [2.0 psig (high drywell pressure scram setpoint)], terminate drywell sprays.

DEVIATIONS

None.

EOP VARIANCE

None.

NMP2 PSTG STEP

PC/P-2 When suppression chamber pressure exceeds 10.57 psig *(suppression chamber spray initiation pressure)*, but only if suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)* and drywell temperature and pressure are within the Drywell Spray Initiation Limit, shut down recirculation pumps and drywell cooling fans and initiate drywell sprays using only those pumps not required to assure adequate core cooling by continuous injection.

BWROG EPG STEP

PC/P-2 When suppression chamber pressure exceeds [13.8 psig (Suppression Chamber Spray Initiation Pressure)] but only if [suppression pool water level is below [17 ft 2 in. (elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water)] and] drywell temperature and pressure are within the Drywell Spray Initiation Limits, [shut down recirculation pumps and drywell cooling fans and] initiate drywell sprays [using only those RHR pumps not required to assure adequate core cooling by continuous operation in the LPCI mode].

DEVIATIONS

- The words "elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water" were replaced by "highest instrumented suppression pool water level".

  The range of suppression pool water level instrumentation does not extend up to the "elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water". Although the actual margin may be wider, this conservative substitute will eliminate the possibility of operation of drywell sprays while the vacuum breakers are inoperable. Such operation may cause the containment differential pressure capability to be exceeded. El. 217 ft. is the highest instrumented suppression pool water level.

- The Drywell Spray Initiation Pressure Limit curve was truncated at 350°F.

  Although the actual margin may be wider, the curve was conservatively truncated at 350°F since the indicating range of the suppression chamber temperature instrumentation does not extend past this value.

- The words "RHR" and "operation in the LPCI mode were deleted. The word "injection was added.

  In accordance with BWROG EPG ISSUES RESOLUTION FILE 8923 which provides for use of pumps other than RHR for containment sprays.

EOP VARIANCE

- The suppression chamber spray initiating pressure was conservatively rounded to be consistent with control room instrument readability.

- The words "drywell cooling fans" were replaced with "drywell unit coolers". This terminology is used throughout this procedure since NMP2's drywell cooling fans are called drywell unit coolers.

- A plant specific reference for initiating drywell sprays was added.

NMP2 PSTG STEP

PC/P-3 When suppression chamber pressure cannot be maintained below the Pressure Suppression Pressure, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

BWROG EPG STEP

PC/P-3 When suppression chamber pressure cannot be maintained below the Pressure Suppression Pressure, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

DEVIATIONS

- The Pressure Suppression Pressure curve was truncated at plant El. 217 ft.

  The range of suppression pool water level instrumentation does not extend up to the calculated end point of the Pressure Suppression Pressure curve. Although the margin to the limit may be wider, truncating the curve at the highest instrumented suppression pool water level in the conservative direction, assures that the Pressure Suppression Pressure Limit is not exceeded. El. 217 ft. is the elevation of the highest instrumented suppression pool water level.

EOP VARIANCE

Values specified on the PSP curve were conservatively rounded to be consistent with control room instrument readability.

NMP2 PSTG STEP

PC/P-4 Before suppression chamber pressure reaches the Primary Containment Pressure Limit, then irrespective of the offsite radioactivity release rate, vent the primary containment, defeating isolation interlocks if necessary, to reduce and maintain pressure below the Primary Containment Pressure Limit as follows:

- If suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)* vent the suppression chamber in accordance with EOP-6, Attachment 21.
- If suppression pool water level is at or above El. 217 ft *(highest instrumented suppression pool water level)* or if the suppression chamber cannot be vented, vent the drywell in accordance with EOP-6, Attachment 21.

BWROG EPG STEP

PC/P-4 Before suppression chamber pressure reaches [the Primary Containment Pressure Limit], then irrespective of the offsite radioactivity release rate, vent the primary containment, defeating isolation interlocks if necessary, to reduce and maintain pressure below [the Primary Containment Pressure Limit] as follows:

- If suppression pool water level is below [26 ft 9 in. (elevation of the bottom of the suppression chamber vent)], vent the suppression chamber in accordance with [procedure for primary containment venting].
- If suppression pool water level is at or above [26 ft 9 in. (elevation of the bottom of the suppression chamber vent)] or if the suppression chamber cannot be vented, vent the drywell in accordance with [procedure for primary containment venting].

DEVIATIONS

- The direction to vent the suppression chamber if suppression pool water level is below the "elevation of the bottom of the suppression chamber vent", was replaced with "highest instrumented suppression pool water level".

  The range of suppression pool instrumentation does not extend up to the elevation of the bottom of the suppression chamber vent. Although the actual margin to the limit may be wider, this conservative substitution eliminates the possibility of attempting to vent the suppression chamber when its vent is submerged. The highest instrumented suppression pool water level is El. 217 ft.

- "EOP 6, Attachment 21" replaced "procedure for primary containment venting".

  EOP 6, Attachment 21 is NMP2's procedure for primary containment venting.

EOP VARIANCE

- Plant specific procedure reference was added to the flowchart to facilitate its use.

- An EOP 6, Attachment 21 Sections aid is added to the flowchart to inform the operators of the options available to them in the venting procedure.

NMP2 PSTG STEP

PC/P-5 When suppression chamber pressure cannot be maintained below the primary containment pressure limit, then irrespective of whether adequate core cooling is assured:

- If suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)*, initiate suppression pool sprays.
- If suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)* and drywell temperature and pressure are within the Drywell Spray Initiation Limit, shut down recirculation pumps and drywell cooling fans and initiate drywell sprays.

BWROG EPG STEP

[PC/P-5 When suppression chamber pressure exceeds [the Primary Containment Pressure Limit], then irrespective of the offsite radioactivity release rate or whether adequate core cooling is assured, vent the primary containment, defeating isolation interlocks if necessary, to reduce and maintain pressure below [the Primary Containment Pressure Limit] as follows:

- If suppression pool water level is below [26 ft 9 in. (elevation of the bottom of the suppression chamber vent)], vent the suppression chamber in accordance with [procedure for primary containment venting].
- If suppression pool water level is at or above [26 ft 9 in. (elevation of the bottom of the suppression chamber vent)] or if the suppression chamber cannot be vented, vent the drywell in accordance with [procedure for primary containment venting].]

PC/P-6 When suppression chamber pressure cannot be maintained below [the Primary Containment Pressure Limit], then irrespective of whether adequate core cooling is assured:

- [If suppression pool water level is below 24 ft 6 in. (elevation of suppression pool spray nozzles)], initiate suppression pool sprays.
- If [suppression pool water level is below [17 ft 2 in. (elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water)] and] drywell temperature and pressure are within the Drywell Spray Initiation Limits, [shut down recirculation pumps and drywell cooling fans and] initiate drywell sprays.

DEVIATIONS

- EPG Step PC/P-5 was deleted.

  This step applies only to plants whose adequate core cooling might be threatened by the use of a pathway for venting. This deletion is consistent with BWROG EPG rev. 4 Appendix B.

- EPG and PSTG step numbering is inconsistent.

  This is a result of the PSTG deletion of EPG Step PC/P-5.

- The direction to initiate suppression pool sprays if suppression pool water level is below the "elevation of the bottom of the suppression pool spray nozzles", was replaced with "highest instrumented suppression pool water level". The highest instrumented suppression pool water level is El. 217 ft.

  The range of suppression pool instrumentation does not extend up to the elevation of the suppression pool spray nozzles. Although the actual margin may be wider, this conservative substitution eliminates the possibility of attempting to initiate suppression pool sprays when the spray nozzles are submerged.

(Continued next page)

DEVIATIONS (Continued from previous page)

- The words "elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water" were replaced by "highest instrumented suppression pool water level".

  The range of suppression pool water level instrumentation does not extend up to the "elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water". Although the actual margin may be wider, this conservative substitute will eliminate the possibility of operation of drywell sprays while the vacuum breakers are inoperable. Such operation may cause the containment differential pressure capability to be exceeded. The highest instrumented suppression pool water level is El. 217 ft.

EOP VARIANCE

- The words "drywell cooling fans" were replaced with "drywell unit coolers". This terminology is used throughout this procedure since NMP2's drywell cooling fans are called drywell unit coolers.

- A plant specific procedure references were added to the flowchart to facilitate their use.

NMP2 PSTG STEP

SP/L Monitor and control suppression pool water level.

> If while executing the following steps Primary Containment Flooding is required, enter Contingency #6.

BWROG EPG STEP

SP/L Monitor and control suppression pool water level.

> If while executing the following steps Primary Containment Flooding is required, enter [procedure developed from Contingency #6].

DEVIATIONS

"Procedure developed from Contingency #6" was replaced by "contingency #6".

At NMP2, the procedure developed from contingency #6 is contingency #6.

EOP VARIANCE

None.

NMP2 PSTG STEP

SP/L-1 Maintain suppression pool water level between El. 201 ft *(maximum suppression pool water level LCO)* and El. 199.5 ft *(minimum suppression pool water level LCO)*. Refer to sampling procedure before discharging water.

If suppression pool water level cannot be maintained above El. 199.5 *(minimum suppression pool water level LCO)*, execute step SP/L-2

If suppression pool water level cannot be maintained below El. 201 ft *(maximum suppression pool water level LCO)*, execute step SP/L-3.

BWROG EPG STEP

SP/L-1 Maintain suppression pool water level between [12 ft 6 in. (maximum suppression pool water level LCO)] and [12 ft 2 in. (minimum suppression pool water level LCO)]; refer to [sampling procedure] prior to discharging water; [suppression pool makeup may be augmented by SPMS].

If SPMS has been initiated, maintain suppression pool water level between [23 ft 9 in. (SPMS initiation setpoint plus suppression pool water level increase which results from SPMS operation)] and [19 ft 11 in. (minimum suppression pool water level LCO)].

If suppression pool water level cannot be maintained above [12 ft 2 in. (minimum suppression pool water level LCO)], execute [Step SP/L-2].

If suppression pool water level cannot be maintained below [12 ft 6 in. (maximum suppression pool water level LCO)] ([23 ft 9 in. (SPMS initiation setpoint plus suppression pool water level increase which results from SPMS operation)] if SPMS has been initiated), execute [Step SP/L-3].

DEVIATIONS

All references to SPMS have been deleted.

NMP2 does not have a SPMS.

EOP VARIANCE

- Plant specific procedure references were added to the flowchart to facilitate their use.

- The statement concerning sampling requirements was revised to better reflect the intent of the step. Regulatory Guide 1.97 (rev. 3 dated May 1983) Table 2 (Accident Sampling Capability) requires obtaining grab samples for primary coolant and sumps (the category for the suppression pool) for the purpose of release assessment verification and analysis. Computation of analysis would then be required prior to discharging effluent to the environment.

NMP2 PSTG STEP

SP/L-2 SUPPRESSION POOL WATER LEVEL BELOW El. 199.5 ft (minimum suppression pool water level LCO)

SP/L-2.1 Maintain suppression pool water level above the Heat Capacity Level Limit.

If suppression pool water level cannot be maintained above the Heat Capacity Level Limit, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; Enter RPV Control Step RC-1 and execute it concurrently with this procedure.

BWROG EPG STEP

SP/L-2 SUPPRESSION POOL WATER LEVEL BELOW [12 ft 2 in. (minimum suppression pool water level LCO)]

[Execute [Steps SP/L-2.1 and SP/L-2.2] concurrently.]

SP/L-2.1 Maintain suppression pool water level above the Heat Capacity Level Limit.

If suppression pool water level cannot be maintained above the Heat Capacity Level Limit, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure.

DEVIATIONS

- The Heat Capacity Level Limit curve was truncated at plant El. 192 ft.

  The range of suppression pool water level instrumentation does not extend down to the calculated end point of the Heat Capacity Level Limit curve. Although the actual margin to the limit may be wider, conservatively truncating the curve at the lowest instrumented suppression pool water level assures that the Heat Capacity Level Limit is not exceeded. El. 192 ft. is the lowest instrumented suppression pool water level.

- The direction to "Execute Steps SP/L-2.1 and SP/L-2.2 concurrently" was deleted.

  Step SP/L-2.2 was deleted from NMP2 PSTGs (see SP/L-2.2 deviation).

- The words "procedure developed from RPV Control Guideline" were replaced with "RPV Control".

  At NMP2 the procedure developed from RPV Control Guideline is called "RPV Control".

EOP VARIANCE

The HCLL figure was supplemented to assist the operators in calculating ΔT_{HC}

NMP2 PSTG STEP

Not applicable.

BWROG EPG STEP

SP/L 2.2 Maintain suppression pool water level above [8 ft 0 in. (elevation of the top of the HPCI exhaust)].

If suppression pool water level cannot be maintained above [8 ft 0 in. (elevation of the top of the HPCI exhaust)], secure HPCI irrespective of whether adequate core cooling is assured.

DEVIATIONS

Step SP/L-2.2 was deleted.

This step applies only to plants with a HPCI. NMP2 does not have a HPCI.

EOP VARIANCE

None.

NMP2 PSTG STEP

SP/L-3 SUPPRESSION POOL WATER LEVEL ABOVE El. 201 ft *(maximum suppression pool water level LCO).*

> Execute Steps SP/L-3.1, SP/L-3.2, and SP/L-3.3 concurrently.

BWROG EPG STEP

SP/L-3 SUPPRESSION POOL WATER LEVEL ABOVE [12 ft 6 in. (maximum suppression pool water level LCO)] ([23 ft 9 in. (SPMS initiation setpoint plus suppression pool water level increase which results from SPMS operation)] if SPMS has been initiated)

> Execute [Steps SP/L-3.1, SP/L-3.2, and SP/L-3.3] concurrently.

DEVIATIONS

The reference to SPMS was deleted.

NMP2 does not have a SPMS.

EOP VARIANCE

None.

NMP2 PSTG STEP

SP/L-3.1 Maintain suppression pool water level below the SRV Tail Pipe Level Limit.

If suppression pool water level cannot be maintained below the SRV Tail Pipe Level Limit, enter RPV Control at Step RC-1 and execute it concurrently with this procedure.

If suppression pool water level and RPV pressure cannot be maintained below the SRV Tail Pipe Level Limit but only if adequate core cooling is assured, terminate injection into the Primary Containment from sources external to the primary containment except from boron injection systems and CRD.

If suppression pool water level and RPV pressure cannot be restored and maintained below the SRV Tail Pipe Level Limit, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

BWROG EPG STEP

SP/L-3.1 Maintain suppression pool water level below the SRV TailPipe Level Limit.

If suppression pool water level cannot be maintained below the SRV Tail Pipe Level Limit, enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure.

If suppression pool water level and RPV pressure cannot be maintained below the SRV Tail Pipe Level Limit but only if adequate core cooling is assured, terminate injection into the RPV from sources external to the primary containment except from boron injection systems and CRD.

If suppression pool water level and RPV pressure cannot be restored and maintained below the SRV Tail Pipe Level Limit, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

DEVIATIONS

- The figure SRV Tail Pipe Level Limit was truncated at plant El. 217 ft.

  The range of suppression pool water level instrumentation does not extend up to the calculated end point of the SRV Tail Pipe Level Limit curve. The curve is therefore truncated at the highest instrumented suppression pool water level. El. 217 ft. is the elevation of the highest instrumented suppression pool water level. Although the actual margin to the SRV Tail Pipe Level Limit may be wider, this truncation provides conservatism in regard to SRV and containment damage.

- The direction to "terminate injection into the RPV from....." was replaced with "terminate injection into the Primary Containment from.....".

  In accordance with the BWROG EPG ISSUES RESOLUTION FILE 8903.

- The words "procedure developed from RPV Control Guideline" were replaced with "RPV Control" .

  At NMP2 the procedure developed from RPV Control Guideline is called "RPV Control".

EOP VARIANCE

None.

NMP2 PSTG STEP

SP/L-3.2 Maintain suppression pool water level below El. 217 ft. *(highest instrumented suppression pool water level).*

If suppression pool water level cannot be maintained below El. 217 ft. *(highest instrumented suppression pool water level)*:

- Terminate drywell sprays.
- If adequate core cooling is assured, terminate injection into the Primary Containment from sources external to the primary containment except from boron injection systems and CRD.

BWROG EPG STEP

SP/L-3.2 Maintain suppression pool water level below [17 ft 2 in. (elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water)].

If suppression pool water level cannot be maintained below [17 ft 2 in. (elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water)]:

- Terminate drywell sprays.
- If adequate core cooling is assured, terminate injection into the RPV from sources external to the primary containment except from boron injection systems and CRD.

DEVIATIONS

- The words "elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water" were replaced by "highest instrumented suppression pool water level".

  The range of suppression pool water level instrumentation does not extend up to the "elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water". Although the actual margin may be wider, this conservative substitute will eliminate the possibility of operation of drywell sprays while the vacuum breakers are inoperable. Such operation may cause the containment differential pressure capability to be exceeded. El. 217 ft. is the highest instrumented suppression pool water level.

- The direction to "terminate injection into the RPV from....." was replaced with "terminate injection into the Primary Containment from.....".

  In accordance with the BWROG EPG ISSUES RESOLUTION FILE 8903.

EOP VARIANCE

The second bullet item of SP/L-3.2 was deleted from the flowchart since at NMP2 the SRV Pipe Level Limit is truncared at elevation 217 ft. If suppression pool water level cannot be maintained below El. 217 ft., RPV pressure and suppression pool water level cannot be maintained below the SRV Tail Pipe Level Limit. Since PSTG Step SP/L-3.1 second contingency item is identical, the second bullet item of this step can be deleted without losing any procedural direction.

NMP2 PSTG STEP

SP/L-3.3 Maintain primary containment water level below the Maximum Primary Containment Water Level Limit.

If primary containment water level cannot be maintained below the Maximum Primary Containment Water Level Limit, terminate injection into the Primary Containment from sources external to the primary containment irrespective of whether adequate core cooling is assured.

BWROG EPG STEP

SP/L-3.3 Maintain primary containment water level below the Maximum Primary Containment Water Level Limit.

If primary containment water level cannot be maintained below the Maximum Primary Containment Water Level Limit, terminate injection into the RPV from sources external to the primary containment irrespective of whether adequate core cooling is assured.

DEVIATIONS

- The direction to "terminate injection into the RPV from....." was replaced with "terminate injection into the Primary Containment from.....".

  In accordance with the BWROG EPG ISSUES RESOLUTION FILE 8903.

EOP VARIANCE

Plant specific procedure reference was added to facilitate its use.

NMP2 PSTG STEP

PC/H Monitor and control hydrogen and oxygen concentrations.

If while executing the following steps:

- The hydrogen or oxygen monitoring system is or becomes unavailable, sample the drywell and suppression chamber for hydrogen and oxygen in accordance with sampling procedure.
- Drywell or suppression chamber hydrogen concentration cannot be determined to be below 6% and drywell or suppression chamber oxygen concentration cannot be determined to be below 5%, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter RPV Control at Step RC-1 and execute it concurrently with this procedure; secure and prevent operation of drywell unit coolers and recombiners and, irrespective of the offsite radioactivity release rate, vent and purge the primary containment, defeating isolation interlocks if necessary, in accordance with Steps PC/H-4.1 through 4.4 until drywell and suppression chamber hydrogen concentrations can be determined to be below 6% or drywell and suppression chamber oxygen concentration can be determined to be below 5%.

BWROG EPG STEP

PC/H Monitor and control hydrogen and oxygen concentrations.

If while executing the following steps:

- The hydrogen or oxygen monitoring system is or becomes unavailable, sample the drywell and suppression chamber for hydrogen and oxygen in accordance with [sampling procedure].
- Drywell or suppression chamber hydrogen concentration cannot be determined to be below 6% and drywell or suppression chamber oxygen concentration cannot be determined to be below 5%, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure; secure and prevent operation of hydrogen mixing systems and recombiners and, irrespective of the offsite radioactivity release rate, vent and purge the primary containment in accordance with [Steps PC/H-4.1 through 4.4] until drywell and suppression chamber hydrogen concentrations can be determined to be below 6% or drywell and suppression chamber oxygen concentrations can be determined to be below 5%.

DEVIATIONS

- The words "hydrogen mixing systems" were replaced with "drywell unit coolers".

  The intent of this paragraph is to eliminate potential ignition sources. The only hydrogen mixing devices which pose a potential for ignition in the drywell are the drywell unit coolers. Therefore in order to maintain plant specific terminology, "drywell unit coolers" was used.

- The direction to vent and purge the primary containment was enhanced by adding the words "defeating isolation interlocks if necessary,"

  This change is in accordance with BWROG EPG ISSUES RESOLUTION FILE 8901.

EOP VARIANCE

The words regarding sampling procedures was revised to clarify the required action. At NMP2, the chemistry department performs the sampling function when required.

NMP2 PSTG STEP

PC/H-1 When drywell or suppression chamber hydrogen concentration reaches 1% *(minimum detectable hydrogen concentration)*, but only if the offsite radioactivity release rate is expected to remain below the offsite release rate LCO, vent and purge the primary containment to restore and maintain drywell and suppression chamber hydrogen concentrations below 1% *(minimum detectable hydrogen concentration)* as follows:

BWROG EPG STEP

PC/H-1 When drywell or suppression chamber hydrogen concentration reaches [0.5% (minimum detectable hydrogen concentration)], but only if the offsite radioactivity release rate is expected to remain below the offsite release rate LCO, vent and purge the primary containment, defeating isolation interlocks if necessary, to restore and maintain drywell and suppression chamber hydrogen concentrations below [0.5% (minimum detectable hydrogen concentration)] as follows:

DEVIATIONS

Defeating isolation interlocks is not authorized

The intent of PC/H-1 is to purge only if it can be done within the limits of normal (non emergency) plant operation (EPG Appendix B, page B-7-115). At NMP2, defeating LOCA isolation interlocks is considered an emergency condition. In the SER for Rev. 4 of the BWROG EPG, the NRC expressed a concern regarding the flexibility of this step, recognizing that this step is intended for normal operation rather than emergency conditions. Additionally, Emergency Procedures Committee (EPC-II) has questioned the prudence of defeating these interlocks in this step (see BWROG EPG ISSUES RESOLUTION FILE 9070).

EOP VARIANCE

The action statement of this step was combined with PSTG steps PC/H-1.1, 2, and 3. See "EOP VARIANCE" for these steps.

NMP2 PSTG STEP

> If while executing the following steps the offsite radioactivity release rate reaches the offsite release rate LCO, isolate the primary containment vent and purge.

BWROG EPG STEP

> If while executing the following steps the offsite radioactivity release rate reaches the offsite release rate LCO, isolate the primary containment vent and purge.

DEVIATIONS

None.

EOP VARIANCE

The words "Vent and purge" were replaced with "purge" since the technical specification definition of purge includes venting.

NMP2 PSTG STEP

PC/H-1.1 Refer to sampling procedure.

PC/H-1.2 If drywell and suppression chamber oxygen concentrations are below 5%, purge the primary containment with nitrogen in accordance with OP-61A.

PC/H-1.3 If drywell or suppression chamber oxygen concentrations are not below 5%, purge the primary containment with air or nitrogen in accordance with OP-61A.

BWROG EPG STEP

PC/H-1.1 Refer to [sampling procedure].

PC/H-1.2 If suppression pool water level is below [26 ft 9 in. (elevation of the bottom of the suppression chamber vent)], vent the suppression chamber in accordance with [procedure for primary containment venting].

If suppression pool water level is at or above [26 ft 9 in. (elevation of the bottom of the suppression chamber vent)] or if the suppression chamber cannot be vented, vent the drywell in accordance with [procedure for primary containment venting].

PC/H-1.3 If the suppression chamber or drywell can be vented:

- If drywell oxygen concentration is below 5%, initiate and maximize the drywell nitrogen purge flow.
- If drywell oxygen concentration is not below 5%, initiate and maximize the drywell air purge flow.

DEVIATIONS

- PC/H 1.2 and 1.3 were revised.

  This revision is in accordance with EPG Issues and Resolutions File # 89-28.

EOP VARIANCE

- Plant specific procedure references were added to facilitate their use.

- PSTG Steps PC/H-1.1, 1.2, and 1.3 were combined into one step with two contingent actions. The primary intent of the step is written out as the step action: "Purge the primary containment to restore and maintain drywell and suppression chamber hydrogen concentrations below 1% in accordance with OP-61A." This emphasizes the required action.

- "Refer to sampling procedures" was deleted since the sampling activities are an integral part of the normal purging procedure (OP-61A) and therefore not required here.

- "The space being purged" replaces "drywell and/or suppression chamber". This more clearly identifies the intent of the step and is consistent with EPG Issues Resolution File # 89-28.

- "At or above" replaces "not below". "At or above" means exactly "not below" and was chosen as better wording.

NMP2 PSTG STEP

Execute Steps PC/H-2 and PC/H-3 concurrently.

PC/H-2 Monitor and control hydrogen and oxygen concentrations in the drywell.

BWROG EPG STEP

Execute Steps [PC/H-2 and PC/H-3] concurrently.

PC/H-2 Monitor and control hydrogen and oxygen concentrations in the drywell.

DEVIATIONS

None.

EOP VARIANCE

None.

NMP2 PSTG STEP

PC/H-2.1 When drywell hydrogen concentration reaches 1% *(~~minimum hydrogen concentration for recombiner operation or~~ minimum detectable hydrogen concentration~~, whichever is higher~~)* but only if drywell hydrogen concentration is below 5% *(maximum hydrogen concentration for recombiner operation ~~or 6%, whichever is lower~~)* or drywell oxygen concentration is below 5% *(maximum oxygen concentration for recombiner operation ~~or 5%, whichever is lower~~)*, place hydrogen recombiners in service taking suction directly on the drywell and operate the drywell unit coolers.

PC/H-2.2 When drywell hydrogen concentration reaches 5% *(maximum hydrogen concentration for recombiner operation ~~or 6%, whichever is lower~~)* and drywell oxygen concentration reaches 5% *(maximum oxygen concentration for recombiner operation, ~~or 5%, whichever is lower~~)*, secure any hydrogen recombiner taking suction on the drywell.

PC/H-2.3 Continue in this procedure at Step PC/H-4.

BWROG EPG STEP

PC/H-2.1 When drywell hydrogen concentration reaches [1% (minimum hydrogen concentration for recombiner operation or minimum detectable hydrogen concentration, whichever is higher)] but only if drywell hydrogen concentration is below [6% (maximum hydrogen concentration for recombiner operation or 6%, whichever is lower)] or drywell oxygen concentration is below [5% (maximum oxygen concentration for recombiner operation or 5%, whichever is lower)], place hydrogen recombiners in service taking suction directly on the drywell and operate the drywell hydrogen mixing system.

PC/H-2.2 When drywell hydrogen concentration reaches [6% (maximum hydrogen concentration for recombiner operation or 6%, whichever is lower)] and drywell oxygen concentration reaches [5% (maximum oxygen concentration for recombiner operation or 5%, whichever is lower)], secure any hydrogen recombiner taking suction on the drywell.

PC/H-2.3 Continue in this procedure at [Step PC/H-4].

DEVIATIONS

- Alternate choices for plant specific parameters were crossed off.

  This enables the operators to quickly identify the current limiting value but still leaves a reference for future use (in case the current value changes and the other becomes the limiting one).

- The PSTG's parenthetical value description "(maximum oxygen concentration for recombiner operation when hydrogen concentration is 5% or above, ~~or 5%, whichever is lower~~), replaces the EPG's "(maximum oxygen concentration for recombiner operation or 5%, whichever is lower)

  At NMP2, the maximum oxygen concentration for recombiner operation is dependent on the concentration of hydrogen in that space.

- The words "drywell hydrogen mixing systems" were replaced with "drywell unit coolers".

  NMP2 utilizes the drywell unit coolers for hydrogen mixing.

EOP VARIANCE

Plant specific procedure reference for recombiner operation was added to facilitate its use.

NMP2 PSTG STEP

PC/H-3 Monitor and control hydrogen and oxygen concentrations in the suppression chamber.

BWROG EPG STEP

PC/H-3 Monitor and control hydrogen and oxygen concentrations in the suppression chamber.

DEVIATIONS

None.

EOP VARIANCE

None.

NMP2 PSTG STEP

PC/H-3.1 When suppression chamber hydrogen concentration reaches 1% (~~minimum hydrogen concentration for recombiner operation or~~ minimum detectable hydrogen concentration~~, whichever is higher~~) but only if suppression chamber hydrogen concentration is below 5% (maximum hydrogen concentration for recombiner operation ~~or 6%, whichever is lower~~) or suppression chamber oxygen concentration is below 5% (maximum oxygen concentration for recombiner operation ~~or 5%, whichever is lower~~), place hydrogen recombiners in service taking suction directly on the suppression chamber.

If no hydrogen recombiner can be placed in service taking suction directly on the suppression chamber but only if the drywell hydrogen concentration is below 5% (maximum hydrogen concentration for recombiner operation ~~or 6%, whichever is lower~~) or drywell oxygen concentration is below 5% (maximum oxygen concentration for recombiner operation ~~or 5%, whichever is lower~~), place hydrogen recombiners in service taking suction indirectly on the suppression chamber by way of the drywell.

BWROG EPG STEP

PC/H-3.1 When suppression chamber hydrogen concentration reaches [1% (minimum hydrogen concentration for recombiner operation or minimum detectable hydrogen concentration, whichever is higher)] but only if suppression chamber hydrogen concentration is below [6% (maximum hydrogen concentration for recombiner operation or 6%, whichever is lower)] or suppression chamber oxygen concentration is below [5% (maximum oxygen concentration for recombiner operation or 5%, whichever is lower)], place hydrogen recombiners in service taking suction directly on the suppression chamber.

If no hydrogen recombiner can be placed in service taking suction directly on the suppression chamber but only if the drywell hydrogen concentration is below [6% (maximum hydrogen concentration for recombiner operation or 6%, whichever is lower)] or drywell oxygen concentration is below [5% (maximum oxygen concentration for recombiner operation or 5%, whichever is lower)], place hydrogen recombiners in service taking suction indirectly on the suppression chamber by way of the drywell.

DEVIATIONS

- Alternate choices for plant specific parameters were crossed off.

  This enables the operators to quickly identify the current limiting value but still leaves a reference for future use (in case the current value changes and the other becomes the limiting one).

- The PSTG's parenthetical value description "(maximum oxygen concentration for recombiner operation when hydrogen concentration is 5% or above, ~~or 5%, whichever is lower~~), replaces the EPG's "(maximum oxygen concentration for recombiner operation or 5%, whichever is lower)

  At NMP2, the maximum oxygen concentration for recombiner operation is dependent on the concentration of hydrogen in that space.

EOP VARIANCE

Plant specific procedure reference for recombiner operation was added to facilitate its use.

NMP2 PSTG STEP

PC/H-3.2 When suppression chamber hydrogen concentration reaches 5% *(maximum hydrogen concentration for recombiner operation ~~or 6%, whichever is lower~~)* and suppression chamber oxygen concentration reaches 5% *(maximum oxygen concentration for recombiner operation ~~or 5%, whichever is lower~~)*, secure all hydrogen recombiners taking suction directly on the suppression chamber.

BWROG EPG STEP

PC/H-3.2 When suppression chamber hydrogen concentration reaches [6% (maximum hydrogen concentration for recombiner operation or 6%, whichever is lower)] and suppression chamber oxygen concentration reaches [5% (maximum oxygen concentration for recombiner operation or 5%, whichever is lower)], secure all hydrogen recombiners taking suction directly on the suppression chamber.

DEVIATIONS

- Alternate choices for plant specific parameters were crossed off.

  This enables the operators to quickly identify the current limiting value but still leaves a reference for future use (in case the current value changes and the other becomes the limiting one).

- The PSTG's parenthetical value description "(maximum oxygen concentration for recombiner operation when hydrogen concentration is 5% or above, ~~or 5%, whichever is lower~~), replaces the EPG's "(maximum oxygen concentration for recombiner operation or 5%, whichever is lower)

  At NMP2, the maximum oxygen concentration for recombiner operation is dependent on the concentration of hydrogen in that space.

EOP VARIANCE

Plant specific procedure reference for recombiner operation was added to facilitate its use.

NMP2 PSTG STEP

PC/H-4 When drywell or suppression chamber hydrogen concentration reaches 6% and drywell or suppression chamber oxygen concentration is above 5%, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter RPV Control at Step RC-1 and execute it concurrently with this procedure; secure drywell unit coolers and, irrespective of the offsite radioactivity release rate, vent and purge the primary containment, defeating isolation interlocks if necessary, to restore and maintain drywell and suppression chamber hydrogen concentrations below 6%, or drywell and suppression chamber oxygen concentrations below 5% as follows:

BWROG EPG STEP

PC/H-4 [When drywell or suppression chamber hydrogen concentration reaches 6% and drywell or suppression chamber oxygen concentration is above 5%,] EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure; secure hydrogen mixing systems and, irrespective of the offsite radioactivity release rate, vent and purge the primary containment, defeating isolation interlocks if necessary, to restore and maintain drywell and suppression chamber hydrogen concentrations below 6% or drywell and suppression chamber oxygen concentrations below 5% as follows:

DEVIATIONS

- The words "hydrogen mixing systems" were replaced with "drywell unit coolers".

  NMP2 utilizes the drywell unit coolers for hydrogen mixing.

- The words "procedure developed from RPV Control Guideline" were replaced with "RPV Control".

  At NMP2 the procedure developed from RPV Control Guideline is called "RPV Control".

EOP VARIANCE

The words "and hydrogen recombiners" were added to ensure that these are secured should this section be entered by way of the first section override which could bypass the steps which would normally secure the recombiners. This is necessary due to the format of the flowchart where the Emergency Depressurization override (prior to PSTG Step PC/H-1) enters the sections flowpath (PSTG step PC/H-4).

NMP2 PSTG STEP

If while executing the following steps suppression pool or drywell sprays have been initiated and:

- Suppression chamber pressure drops below 1.68 psig *(high drywell pressure scram setpoint)*, terminate suppression pool sprays.
- Drywell pressure drops below 1.68 psig *(high drywell pressure scram setpoint)*, terminate drywell sprays.

BWROG EPG STEP

If while executing the following steps suppression pool or drywell sprays have been initiated and:

- Suppression chamber pressure drops below [2.0 psig (high drywell pressure scram setpoint)], terminate suppression pool sprays.
- Drywell pressure drops below [2.0 psig (high drywell pressure scram setpoint)], terminate drywell sprays.

DEVIATIONS

None.

EOP VARIANCE

"Suppression pool sprays" was replaced with "suppression chamber sprays" for consistency throughout the procedure.

NMP2 PSTG STEP

PC/H-4.1 If suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)*, initiate suppression pool sprays using only those pumps not required to assure adequate core cooling by continuous injection.

BWROG EPG STEP

PC/H-4.1 If suppression pool water level is below [24 ft 6 in. (elevation of suppression pool spray nozzles)], initiate suppression pool sprays [using only those RHR pumps not required to assure adequate core cooling by continuous operation in the LPCI mode].

DEVIATIONS

- The direction to initiate suppression pool sprays with the condition "but only if suppression pool water level is below [24 ft. 6 in.] (elevation of suppression pool spray nozzles)" was replaced with "but only if suppression pool water level is below El. 217 ft (highest instrumented suppression pool water level)".

  The range of suppression pool water level instrumentation does not extend up to the level of the suppression spray nozzles. Although the actual margin may be wider, this conservative substitute eliminates the possibility of attempting to spray while the spray nozzles are submerged in the suppression pool. El. 217 ft. is the highest instrumented suppression pool water level.

- The words "RHR" and "operation in the LPCI mode were deleted. The word "injection was added.

  In accordance with BWROG EPG ISSUES RESOLUTION FILE 8923 which provides for use of pumps other than RHR for containment sprays.

EOP VARIANCE

Plant specific procedure references were added to facilitate their use.

[illegible]

NMP2 PSTG STEP

PC/H-4.2 If suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)*, vent the suppression chamber in accordance with procedure for primary containment venting.

If suppression pool water level is at or above El. 217 ft *(highest instrumented suppression pool water level)* or if the suppression chamber cannot be vented, vent the drywell in accordance with N2-OP-61A.

BWROG EPG STEP

PC/H-4.2 If suppression pool water level is below [26 ft 9 in. (elevation of the bottom of the suppression chamber vent)], vent the suppression chamber in accordance with [procedure for primary containment venting].

If suppression pool water level is at or above [26 ft 9 in. (elevation of the bottom of the suppression chamber vent)] or if the suppression chamber cannot be vented, vent the drywell in accordance with [procedure for primary containment venting].

DEVIATIONS

The direction to vent the suppression chamber if suppression pool water level is below the "elevation of the bottom of the suppression chamber vent", was replaced with "highest instrumented suppression pool water level".

The range of suppression pool instrumentation does not extend up to the elevation of the bottom of the suppression chamber vent. Although the actual margin to the limit may be wider, this conservative substitution eliminates the possibility of attempting to vent the suppression chamber when its vent is submerged. The highest instrumented suppression pool water level is El. 217 ft.

EOP VARIANCE

The words "in accordance with procedure for primary containment venting" were replaced with NMP2's plant specific procedure.

NMP2 PSTG STEP

PC/H-4.3 If the suppression chamber or drywell can be vented, initiate and maximize the drywell purge flow.

BWROG EPG STEP

PC/H-4.3 If the suppression chamber or drywell can be vented, initiate and maximize the drywell purge flow.

DEVIATIONS

None.

EOP VARIANCE

Refer to EOP variance for PC/H-4.2.

NMP2 PSTG STEP

PC/H-4.4 If suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)* and drywell temperature and pressure are within the Drywell Spray Initiation Limits, shut down recirculation pumps and drywell cooling fans and initiate drywell sprays using only those pumps not required to assure adequate core cooling by continuous injection.

BWROG EPG STEP

PC/H-4.4 If [suppression pool water level is below [17 ft 2 in. (elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water)] and] drywell temperature and pressure are within the Drywell Spray Initiation Limits, [shut down recirculation pumps and drywell cooling fans and] initiate drywell sprays [using only those RHR pumps not required to assure adequate core cooling by continuous operation in the LPCI mode].

DEVIATIONS

- The direction to vent the suppression chamber if suppression pool water level is below the "elevation of the bottom of the suppression chamber vent", was replaced with "highest instrumented suppression pool water level".

  The range of suppression pool instrumentation does not extend up to the elevation of the bottom of the suppression chamber vent. Although the actual margin to the limit may be wider, this conservative substitution eliminates the possibility of attempting to vent the suppression chamber when its vent is submerged. The highest instrumented suppression pool water level is El. 217 ft.

- The Drywell Spray Initiation Limit curve was truncated at 350°F.

  Although the actual margin to the limit may be wider; the curve was conservatively truncated at 350°F since the indicating range of the suppression chamber temperature instrumentation does not extend past this value.

- The words "RHR" and "operation in the LPCI mode were deleted. The word "injection was added.

  In accordance with BWROG EPG ISSUES RESOLUTION FILE 8923 which provides for use of pumps other than RHR for containment sprays.

EOP VARIANCE

- Plant specific procedure reference was added for operation of drywell sprays to facilitate its use.

- The words "and the primary containment vent path is established" were added. This is done since initiation of a spark by the actuation of sprays is possible. It is preferable to initiate sprays after the vent lineup is established to limit the pressure spike should an explosion take place. Additionally, purging is designed to solve the problem while spraying just mitigates the problem. See discussions of EPC Resolutions File No. 9022.

NMP2 PSTG STEP

PC/H-5 When drywell or suppression chamber hydrogen concentration cannot be restored and maintained below 6% and drywell or suppression chamber oxygen concentration cannot be restored and maintained below 5%, then irrespective of whether adequate core cooling is assured:

BWROG EPG STEP

PC/H-5 When drywell or suppression chamber hydrogen concentration cannot be restored and maintained below 6% and drywell or suppression chamber oxygen concentration cannot be restored and maintained below 5%, then irrespective of whether adequate core cooling is assured:

DEVIATIONS

None.

EOP VARIANCE

None.

NMP2 PSTG STEP

If while executing the following steps suppression pool or drywell sprays have been initiated and:

- Suppression chamber pressure drops below 1.68 psig *(high drywell pressure scram setpoint)*, terminate suppression pool sprays.
- Drywell pressure drops below 1.68 psig *(high drywell pressure scram setpoint)*, terminate drywell sprays.

BWROG EPG STEP

If while executing the following steps suppression pool or drywell sprays have been initiated and:

- Suppression chamber pressure drops below [2.0 psig (high drywell pressure scram setpoint)], terminate suppression pool sprays.
- Drywell pressure drops below [2.0 psig (high drywell pressure scram setpoint)], terminate drywell sprays.

DEVIATIONS

None.

EOP VARIANCE

This step is not repeated here as the flowchart's format contains this override previously and applies to this step too.

NMP2 PSTG STEP

PC/H-5.1 If suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)*, initiate suppression pool sprays.

PC/H-5.2 If suppression pool water level is below El. 217 ft *(highest instrumented suppression pool water level)* and drywell temperature and pressure are within the Drywell Spray Initiation Limit, shut down recirculation pumps and drywell cooling fans and initiate drywell sprays.

BWROG EPG STEP

PC/H-5.1 If suppression pool water level is below [24 ft 6 in. (elevation of suppression pool spray nozzles)], initiate suppression pool sprays.

PC/H-5.2 If [suppression pool water level is below [17 ft 2 in. (elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water)] and] drywell temperature and pressure are within the Drywell Spray Initiation Limits, [shut down recirculation pumps and drywell cooling fans and] initiate drywell sprays.

DEVIATIONS

- The direction to initiate suppression pool sprays with the condition "but only if suppression pool water level is below [24 ft. 6 in.] (elevation of suppression pool spray nozzles)" was replaced with "but only if suppression pool water level is below El. 217 ft (highest instrumented suppression pool water level)".

  The range of suppression pool water level instrumentation does not extend up to the level of the suppression spray nozzles. Although the actual margin may be wider, this conservative substitute eliminates the possibility of attempting to spray while the spray nozzles are submerged in the suppression pool. El. 217 ft. is the highest instrumented suppression pool water level.

- The words "elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water" were replaced by "highest instrumented suppression pool water level".

  The range of suppression pool water level instrumentation does not extend up to the "elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water". Although the actual margin may be wider, this conservative substitute will eliminate the possibility of operation of drywell sprays while the vacuum breakers are inoperable. Such operation may cause the containment differential pressure capability to be exceeded. El. 217 ft. is the highest instrumented suppression pool water level.

Appendix A. Section: Primary Containment Control

EOP VARIANCE

None.

Appendix A. Section: Primary Containment Control

EOP VARIANCE

None.

NMP2 PSTG STEP

PURPOSE

The purpose of this guideline is to:

- Protect equipment in the secondary containment,
- Limit radioactivity release to the secondary containment, and either:
- Maintain secondary containment integrity, or
- Limit radioactivity release from the secondary containment.

BWROG EPG STEP

PURPOSE

The purpose of this guideline is to :

- Protect equipment in the secondary containment,
- Limit radioactivity release to the secondary containment, and either:
- Maintain secondary containment integrity, or
- Limit radioactivity release from the secondary containment.

DEVIATIONS

None.

EOP VARIANCE

The purpose is not included in the flowchart. This is considered a training item and not required as a procedure note or step.

NMP2 PSTG STEP

ENTRY CONDITIONS

The entry conditions for this guideline are any of the following secondary containment conditions:

- differential pressure at or above 0 in. of water
- An area temperature above an isolation setpoint
- HVR exhaust radiation level above the isolation setpoint
- An unexpected high area radiation level alarm
- A floor drain sump water level high - high

BWROG EPG STEP

The entry conditions for this guideline are any of the following secondary containment conditions:

- Differential pressure at or above 0 in. of water
- An area temperature above the maximum normal operating temperature
- A HVAC cooler differential temperature above the maximum normal operating differential temperature
- A HVAC exhaust radiation level above the maximum normal operating radiation level
- An area radiation level above the maximum normal operating radiation level
- A floor drain sump water level above the maximum normal operating water level
- An area water level above the maximum normal operating water level

DEVIATIONS

- Table 1 - OPERATING VALUES OF SECONDARY CONTAINMENT PARAMETERS, was not included.

  NMP2 utilizes isolation setpoints and alarms to identify Secondary Containment Control entry conditions. Refer to the following additional discussion.

- The high temperature entry condition was changed from "above the maximum normal operating temperature" to "above an isolation setpoint".

  At NMP2 the maximum normal operating values for area temperatures are defined to be the isolation setpoints. Areas which have isolation functions typically have high energy primary systems passing through that area. With the exception of HPCI Room, Torus Room, and Main Steam Tunnel, these are consistent with EPG Table 1. NMP2 does not have a HPCI or Torus Room. NMP2's Main Steam Tunnel is not part of the secondary containment.

- The HVAC cooler differential temperature entry condition was deleted.

  HVAC cooler differential temperature is not instrumented at NMP2.

- HVAC was changed to HVR.

  Plant specific terminology.

(Continued next page)

DEVIATIONS (continued from previous page)

- The high HVAC exhaust radiation entry condition was changed from "above the maximum normal operating radiation level" to "above an isolation setpoint".

  The maximum normal operating value for HVAC exhaust radiation is defined to be the isolation setpoint at NMP2

- The high area radiation level entry condition was changed from "above the maximum normal operating radiation level" to "an unexpected high area radiation alarm".

  The maximum normal operating values for area radiation levels are defined to be the alarm setpoints at NMP2. Limiting entry to "unexpected" alarms precludes unnecessary entry of the EOPs following routine evolutions and is consistent with language in the NMP2 Emergency Plan. NMP2 area radiation monitor locations are more extensive that provided in Table 1 of the EPG.

- The high floor drain sump water level entry condition has been changed from "above the maximum normal operating water level" to "high-high".

  The maximum normal operating value for floor drain sump water level is defined to be the high-high level at NMP2.

- The high area water level entry condition was deleted.

  All reactor building areas of concern drain into the floor drain sumps at NMP2. Since the floor drain sump high-high water level would be reached before a significant amount of water could accumulate in a reactor building area, a separate entry condition for a high area water level need not be specified.

EOP VARIANCE

- A step is added regarding the emergency plan, if required. This was done to remind the operators that emergency plan actions may be required.

- The order in which entry conditions are presented in the flowchart differ from the PSTG in order to be consistent with the procedure section layout.

- "Reactor Building" is used throughout the procedure in lieu of "Secondary Containment". This is consistent with NMP2's terminology.

NMP2 PSTG STEP

OPERATOR ACTIONS

If while executing the following steps HVR exhaust radiation level exceeds an isolation setpoint:

- Confirm or manually initiate isolation of HVR, and
- Confirm initiation of or manually initiate SBGT.

BWROG EPG STEP

OPERATOR ACTIONS

If while executing the following steps secondary containment HVAC exhaust radiation level exceeds [20 mR/hr (secondary containment HVAC isolation setpoint)]:

- Confirm or manually initiate isolation of secondary containment HVAC, and
- Confirm initiation of or manually initiate SBGT.

DEVIATIONS

- "Secondary containment HVAC" was changed to "HVR".

  Plant specific terminology.

- A value was not specified for the HVAC isolation setpoint.

  HVR exhaust radiation may be monitored only on the Digital Radiation Monitoring System computer. While a single Technical Specification is provided as an isolation setpoint, the actual set point is determined using more conservative assumptions and is subject to change.

EOP VARIANCE

None.

NMP2 PSTG STEP

If while executing the following steps:

- HVR isolates, and,
- HVR exhaust radiation level is below isolation setpoint,

restart HVR, defeating high drywell pressure and low RPV water level isolation interlocks if necessary.

BWROG EPG STEP

If while executing the following steps:

- Secondary containment HVAC isolates, and,
- Secondary containment HVAC exhaust radiation level is below [20 mR/hr (secondary containment HVAC isolation setpoint)], restart secondary containment HVAC, defeating high drywell pressure and low RPV water level isolation interlocks if necessary.

DEVIATIONS

- "Secondary containment HVAC" was changed to "HVR".

  Plant specific terminology.

- A value was not specified for the HVAC isolation setpoint.

  HVR exhaust radiation may be monitored only on the Digital Radiation Monitoring System computer. While a single Technical Specification is provided as an isolation setpoint, the actual set point is determined using more conservative assumptions and is subject to change.

EOP VARIANCE

Plant specific procedure reference for defeating interlocks was added to facilitate procedure use.

NMP2 PSTG STEP

Irrespective of the entry condition, execute Steps SC/T, SC/R, and SC/L concurrently.

BWROG EPG STEP

Irrespective of the entry condition, execute [Steps SC/T, SC/R, and SC/L] concurrently.

DEVIATIONS

None.

EOP VARIANCE

An additional step was added to monitor HVR Exhaust Radiation Levels. This was added to ensure that the operators review this parameter periodically since it is required for the preceding override.

NMP2 PSTG STEP

SC/T Monitor and control reactor building temperatures.

SC/T-1 Operate available area coolers.

SC/T-2 When an area temperature exceeds its isolation setpoint, isolate all systems that are discharging into the area except systems required to shut down the reactor, assure adequate core cooling, protect Primary Containment integrity, or suppress a fire. 1

BWROG EPG STEP

SC/T Monitor and control secondary containment temperatures.

SC/T-1 Operate available area coolers.

SC/T-2 If secondary containment HVAC exhaust radiation level is below [20 mR/hr (secondary containment HVAC isolation setpoint)], operate available secondary containment HVAC.

SC/T-3 When an area temperature exceeds its maximum normal operating temperature, isolate all systems that are discharging into the area except systems required to shut down the reactor, assure adequate core cooling, or suppress a fire. 1

DEVIATIONS

- "Secondary containment" was replaced with "reactor building"

  Plant specific terminology.

- A value was not specified for the HVAC isolation setpoint.

  HVR exhaust radiation may be monitored only on the Digital Radiation Monitoring System computer. While a single Technical Specification is provided as an isolation setpoint, the actual set point is determined using more conservative assumptions and is subject to change.

- "Maximum normal operating temperature" was changed to "isolation setpoint".

  The maximum normal operating values for area temperatures are defined to be the isolation setpoints at NMP2.

- The words "protect primary containment integrity," were added.

  In accordance with BWROG's EPG Issues Resolution File No. 8902.

- Step SC/T-2 was deleted.

  This step is redundant to the preceding override which requires to restart HVR if HVR exhaust radiation level is below the isolation setpoint. At NMP2, procedurally, as well as by design, all available HVAC is being operated as a normal lineup.

(Continued next page)

DEVIATIONS (Continued from previous page)

- PSTG step numbers are different from those in the BWROG EPG.

  This was done as a result of deleting EPG Step SC/T-2 from the PSTG.

EOP VARIANCE

- The words of PSTG Step SC/T-1 were reworded to better reflect the intent of this step as it applies to NMP2.
- The word "except" is underlined to emphasize the exceptions.

NMP2 PSTG STEP

Execute Steps SC/T-3 and SC/T-4 concurrently.

SC/T-3 If a primary system is discharging into the reactor building:

SC/T-3.1 Before any RB general area temperature on Els. 261, 289, 328 ft. reaches 135°F (when personnel access is required for either control rod insertion or boron injection) or any RB area temperature reaches 212°F *(maximum safe operating temperature)*, enter RPV Control at Step RC-1 and execute it concurrently with this procedure.

SC/T-3.2 When a RB general area temperature on Els. 261, 289, 328 ft. reaches 135°F (when personnel access is required for either control rod insertion or boron injection) or any RB area temperature reaches 212°F *(maximum safe operating temperature)* in more than one area, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

SC/T-4 When an area temperature exceeds 135°F *(maximum safe operating temperature)* in more than one area, shut down the reactor.

BWROG EPG STEP

Execute [Steps SC/T-4 and SC/T-5] concurrently.

SC/T-4 If a primary system is discharging into secondary containment:

SC/T-4.1 Before any area temperature reaches its maximum safe operating temperature, enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure.

SC/T-4.2 When an area temperature exceeds its maximum safe operating temperature in more than one area, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

SC/T-5 When an area temperature exceeds its maximum safe operating temperature in more than one area, shut down the reactor.

DEVIATIONS

- "Secondary containment" replaced with "reactor building".

  Plant specific terminology.

- Values of 135°F and 212°F are utilized as the "maximum safe operating temperature".

  At NMP2 all secondary containment's areas have the same maximum safe operating temperature of 212°F, based on equipment qualification requirements, however, RB elevations 261, 289, and 328 are designated as having a maximum safe operating temperature of 135°F when RB personnel access is required for either boron injection or control rod insertion. Maximum safe operating temperature is the highest temperature at which neither safety related equipment will fail nor personnel access necessary for the safe shutdown of the plant is precluded. At NMP2, equipment qualification limiting temperature is not as restrictive as the limiting temperature for personnel access (when required). Plant personnel access to the secondary containment may be necessary for safe shutdown activities such as alternate control rod insertion and some boron injection methods. When access is required and temperatures rise, personnel access may be significantly constrained. Step SC/T-4 retains one value for maximum safe operating temperature.

- PSTG step numbers are different from those in the BWROG EPG.

  This was done as a result of deleting EPG Step SC/T-2 from the PSTG.

- "Procedure developed from RPV Control Guideline" was replaced with "RPV Control".

  At NMP2, the procedure developed from "RPV Control Guideline" is called "RPV Control".

EOP VARIANCE

Plant specific procedure reference was added to facilitate its use.

Appendix A. Section: Secondary Containment Control

NMP2 PSTG STEP

SC/R Monitor and control reactor building radiation levels.

SC/R-1 When a radiation level exceeds its high alarm setpoint, isolate all systems that are discharging into that area except systems that are required to shut down the reactor, assure adequate core cooling, protect Primary Containment integrity, or suppress a fire.

BWROG EPG STEP

SC/R Monitor and control secondary containment radiation levels.

SC/R-1 When an area radiation level exceeds its maximum normal operating radiation level, isolate all systems that are discharging into the area except systems required to shut down the reactor, assure adequate core cooling, or suppress a fire.

DEVIATIONS

- The words "maximum normal operating radiation level" were replaced with "high alarm setpoint".

  The maximum normal operating values for area radiation are defined to be the high alarm setpoints at NMP2.

- The words "protect primary containment integrity," were added.

  In accordance with BWROG's EPG Issues Resolution File No. 8902.

- "Secondary containment" replaced with "reactor building".

  Plant specific terminology.

EOP VARIANCE

- An additional step was added to the RB Radiation leg of the flowchart regarding S-EPP-1 Radiation Emergencies. This serves as a reminder that if a RB ARM exceeds its high alarm setpoint, S-EPP-1 must be implemented. This step was added specifically at this point to address the possibility that entry into this procedure may not necessary be high radiation level condition and the EAP-1 step was previously passed.

- The word "except" is underlined to emphasize the exceptions.

NMP2 PSTG STEP

Execute Steps SC/R-2 and SC/R-3 concurrently.

SC/R-2 If a primary system is discharging into the reactor building:

SC/R-2.1 Before any area radiation level reaches 10 R/hr. *(maximum safe operating radiation level)*, enter RPV Control at Step RC-1 and execute it concurrently with this procedure.

RC/R-2.2 When an area radiation level exceeds 10 R/hr. *(maximum safe operating radiation level)* in more than one area, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

SC/R-3 When an area radiation level exceeds 10 R/hr. *(maximum safe operating radiation level)* in more than one area, shut down the reactor.

BWROG EPG STEP

Execute [Steps SC/R-2 and SC/R-3] concurrently.

SC/R-2 If a primary system is discharging into secondary containment:

SC/R-2.1 Before any area radiation level reaches its maximum safe operating radiation level, enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure.

SC/R-2.2 When an area radiation level exceeds its maximum safe operating radiation level in more than one area, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

SC/R-3 When an area radiation level exceeds its maximum safe operating radiation level in more than one area, shut down the reactor.

DEVIATIONS

- "Secondary containment" was changed to "reactor building".

  Plant specific terminology.

- A value of 10 R/hr. was added to the "maximum safe operating radiation level".

  At NMP2 all secondary containment's areas have the same maximum safe operating radiation level of 10 R/hr. The value of 10 R/hr, maximum safe operating radiation level, is the highest radiation level at which neither safety related equipment will fail nor personnel access necessary for the safe shutdown of the plant is constrained. At NMP2, equipment qualification limiting radiation levels are not as restrictive as the limiting radiation levels are for personnel access. Plant personnel access to the secondary containment may be necessary for safe shutdown activities such as alternate control rod insertion and some boron injection methods. When access is required and radiation levels rise, personnel access may be significantly constrained. Although a high radiation value is specified, it is not intended to authorize personnel access which will exceed 10CFR Emergency Exposure Guidelines.

- "Procedure developed from RPV Control Guideline" was replaced with "RPV Control".

  At NMP2, the procedure developed from "RPV Control Guideline" is called "RPV Control".

EOP VARIANCE

Plant specific procedure reference for plant shutdown was added to facilitate its use.

NMP2 PSTG STEP

SC/L Monitor and control reactor building water levels.

SC/L-1 When a floor drain sump is above its high - high level setpoint, operate available sump pumps to restore and maintain it below its high - high level setpoint.

If any floor drain sump cannot be restored and maintained below its high - high level setpoint, isolate all systems that are discharging water into the sump or area except systems required to shut down the reactor, assure adequate core cooling, protect Primary Containment integrity, or suppress a fire.

BWROG EPG STEP

SC/L Monitor and control secondary containment water levels.

SC/L-1 When a floor drain sump or area water level is above its maximum normal operating water level, operate available sump pumps to restore and maintain it below its maximum normal operating water level.

If any floor drain sump or area water level cannot be restored and maintained below its maximum normal operating water level, isolate all systems that are discharging water into the sump or area except systems required to shut down the reactor, assure adequate core cooling, or suppress a fire.

DEVIATIONS

- "Secondary containment" was changed to "reactor building".

  Plant specific terminology.

- "floor drain sump or area water level is above its maximum normal operating water level" and "floor drain sump or area water level cannot be restored and maintained below its maximum normal operating water level" were replaced with "floor drain sump is above its high - high level setpoint" and "floor drain sump cannot be restored and maintained below its high - high level setpoint respectively.

  All reactor building areas of concern drain into the floor drain sumps at NMP2. Since the floor drain sump high-high water level would be reached before a significant amount of water could accumulate in a reactor building area, a separate condition for a high area water level need not be specified. Also, the maximum normal operating value for floor drain sump water level is defined to be the high-high level at NMP2.

- The words "protect primary containment integrity," were added.

  In accordance with BWROG's EPG Issues Resolution File No. 8902.

EOP VARIANCE

~~None.~~
The word "except" is underlined to emphasize the exceptions.

NMP2 PSTG STEP

> Execute Steps SC/L-2 and SC/L-3 concurrently.

SC/L-2 If a primary system is discharging into the reactor building:

SC/L-2.1 Before any area water level reaches a RB flooding alarm level, enter RPV Control at Step RC-1 and execute it concurrently with this procedure.

SC/L-2.2 When an area water level reaches a RB flooding alarm level in more than one area, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

SC/L-3 When an area water level reaches an ECCS equipment room flooding alarm level in more than one area, shut down the reactor.

BWROG EPG STEP

Execute [Steps SC/L-2 and SC/L-3] concurrently.

SC/L-2 If a primary system is discharging into secondary containment:

SC/L-2.1 Before any area water level reaches its maximum safe operating water level, enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure.

SC/L-2.2 When an area water level exceeds its maximum safe operating water level in more than one area, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

SC/L-3 When an area water level exceeds its Maximum Safe Operating Water Level in more than one area, shut down the reactor.

[Tabulation of Max Normal Operating Temperatures and Max Safe Operating Temperatures]

DEVIATIONS

- "Secondary containment" was changed to "reactor building".

  Plant specific terminology.

- The words "area water level reaches its maximum safe operating level" were replaced with "area water level reaches a RB flooding alarm level".

  The maximum safe area water level is defined to be a RB flooding alarm level at NMP2. RB flooding alarms are provided at the lowest areas in the reactor building and therefore would be the first to flood. RB flooding alarm levels are set at approximately 2.5 inches above the floor. Above this level, safety related equipment may not be functional. Therefore, this level was chosen as the RB flooding alarm level.

- "Procedure developed from RPV Control Guideline" was replaced with "RPV Control".

  At NMP2, the procedure developed from "RPV Control Guideline" is called "RPV Control".

EOP VARIANCE

Plant specific procedure reference for plant shutdown was added to facilitate its use.

NMP2 PSTG STEP

PURPOSE

The purpose of this guideline is to limit radioactivity release into areas outside the primary and secondary containments.

BWROG EPG STEP

PURPOSE

The purpose of this guideline is to limit radioactivity release into areas outside the primary and secondary containments.

DEVIATIONS

None.

EOP VARIANCE

The purpose is not included in the flowchart. This is considered a training item and not required as a procedure note or step.

NMP2 PSTG STEP

ENTRY CONDITION

The entry conditions for this guideline are:

- Stack GEMs exceeds the alarm value setpoint.
- Vent GEMs exceeds the alarm value setpoint.
- DRMS Liquid Effluent Monitor exceeds the alert value.

BWROG EPG STEP

ENTRY CONDITIONS

The entry condition for this guideline is:

Offsite radioactive release rate above the offsite release rate which requires an Alert.

DEVIATIONS

The words "Offsite radioactive release rate above the offsite release rate which requires an Alert" were replaced.

The three entry conditions specified are consistent with the conditions which require an Emergency Plan unusual event level classification. They are specified directly rather than referencing the Emergency Plan such that procedure entry is not based upon or driven by the Emergency Plan. In addition, by using these symptomatic entry conditions, immediate action to mitigate the accident can begin, rather than waiting until confirmatory chemistry samples as required by the Emergency Plan. Entry into this procedure at the unusual event level results in quicker response to stop or minimize the offsite release.

EOP VARIANCE

- Panel designations are provided in the flowchart to better identify where entry condition parameter readings can be obtained.

- Specific DRMS rad monitors are listed in the entry conditions to eliminate any potential confusion.

- An additional step is added concerning the activation of the Emergency Plan, if required. This will remind the operators that concurrent execution of the Emergency Plan may be necessary.

NMP2 PSTG STEP

> If while executing the following steps Turbine Building HVAC is shutdown, restart Turbine Building HVAC.

BWROG EPG STEP

> If while executing the following steps turbine building HVAC is shutdown [or isolated due to high radiation], restart turbine building HVAC, defeating isolation interlocks if necessary.

DEVIATIONS

The words "defeating isolation interlocks" and "or isolated due to high radiation" were deleted.

NMP2 does not have Turbine Building HVAC isolation interlocks.

EOP VARIANCE

Plant specific procedure reference was added to the flowchart to facilitate its use.

NMP2 PSTG STEP

RR-1 Isolate all primary systems that are discharging into areas outside the primary and secondary containments except systems required to assure adequate core cooling or shut down the reactor.

BWROG EPG STEP

RR-1 Isolate all primary systems that are discharging into areas outside the primary and secondary containments except systems required to assure adequate core cooling or shut down the reactor.

DEVIATIONS

None.

EOP VARIANCE

In the flowchart, the word except is underlined for emphasis.

NMP2 PSTG STEP

RR-2 When offsite radioactivity release rate approaches or exceeds the Emergency Plan "General Emergency" level but only if a primary system is discharging into an area outside the primary and secondary containments, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter RPV Control at Step RC-1 and execute it concurrently with this procedure.

BWROG EPG STEP

RR-2 When offsite radioactivity release rate approaches or exceeds the offsite release rate which requires a General Emergency but only if a primary system is discharging into an area outside the primary and secondary containments, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter [procedure developed from the RPV Control Guideline] at [Step RC- 1] and execute it concurrently with this procedure.

DEVIATIONS

- The words "offsite release rate which requires a General Emergency" were replaced with "Emergency Plan "General Emergency" level.

  At NMP2 offsite release rate which requires a General Emergency is the Emergency Plan's General Emergency level.

- "Procedure developed from RPV Control Guideline" was replaced with "RPV Control".

  At NMP2, the procedure developed from "RPV Control Guideline" is called "RPV Control".

EOP VARIANCE

The words "as determined by chemistry" were added to identify the source of the information.

NMP2 PSTG STEP

PURPOSE

The purpose of this guideline is to limit non-condensible radioactive gas release through the MSIVs.

ENTRY CONDITIONS

The entry condition for this guideline is a condition which requires MSIV isolation and a high - high main steam line radiation level with any of the following:

- Stack or vent GEMs exceed the alarm setpoint, or
- Turbine building HVAC exhaust radiation above the Alert level or cannot be determined, or
- Offgas pretreatment radiation above the Alert level or cannot be determined.

BWROG EPG STEP

Not Applicable.

DEVIATIONS

An "MSIV Leakage Control" guideline was added.

In accordance with licensing commitments regarding MSIV leakage concerns at NMP2 (NMPC letter NMP2L 1020 dated April 7, 1987). This guideline does not conflict with the BWROG EPGs.

EOP VARIANCE

- Specific DRMS monitors and the respective alarm colors are provided to facilitate their use.

- An additional step concerning the activation of the Emergency Plan was added to alert the operators that implementation of the Emergency Plan may be required.

- The purpose is not included in the flowchart. This is considered a training item and not required as a procedure note or step.

NMP2 PSTG STEP

OPERATOR ACTIONS

If while executing the following steps:

- Turbine Building HVAC exhaust radiation level exceeds the Turbine Building Release Limit or cannot be determined, verify the Turbine Building HVAC is operating in the un-isolated mode if available ~~(OP-55)~~.
- Control Building HVAC radiation level cannot be maintained below 5.92 x 10^{-6} μCi/cc, verify that the control building HVAC is operating in the pressurization mode ~~(OP-53A, Section H).~~

BWROG EPG STEP

Not Applicable.

DEVIATIONS

Not Applicable.

EOP VARIANCE

- The flowchart specifically identifies which procedure sections to use.
- The flowchart uses the word "normal" instead of "un-isolated mode". The word normal was preferred by the plant's operators during the EOP validation process. There intent of the sentence was maintained.

NMP2 PSTG STEP

MSL-1 Verify that the MSIVs are closed.

MSL-2 When main steam line radiation exceeds the MSL Rad Limit or cannot be determined, and either:

- Turbine building radiation level exceeds the Turbine Building Release Limit or cannot be determined, or
- Offgas pretreatment radiation level exceeds the Offgas Release Limit or cannot be determined, or
- Offsite radiation release rate which exceeds the Emergency Plan "Alert" level, then operate available SJAEs through Offgas.

BWROG EPG STEP

Not Applicable.

DEVIATIONS

Not Applicable.

EOP VARIANCE

- The words "as determined by chemistry" were added to identify the source of the information.
- Plant specific procedure reference was added to facilitate its use.

NMP2 PSTG STEP

MSL-2.1 If SJAEs or Offgas are not available and Turbine Building HVAC radiation level exceeds the Turbine Building Release Limit, then:

1. Close the following valves:
   - Main turbine stop, control, and bypass valves
   - 2ARC-MOV5A, B, and C
   - 2MSS-AOV92A and B
   - 2ASS-AOV148
   - 2TME-AOV121
   - 2ARC-AOV105
   - 2ARC-MOV15A and B
2. Establish main turbine seals and start all circulating water pumps.
3. Fill the main steam lines between the MSIVs with water.

MSL-3 If offsite radioactivity release rate cannot be maintained below the Emergency Plan "General Emergency" level and a primary system is discharging into an area outside the primary and secondary containments, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter RPV Control at Step RC-1 and execute it concurrently with this procedure.

BWROG EPG STEP

Not Applicable.

DEVIATIONS

Not Applicable.

EOP VARIANCE

- The words "as determined by chemistry" were added to identify the source of the information.

- Plant specific procedure reference was added to facilitate its use.

NMP2 PSTG STEP

If while executing the following steps:

- Any control rod cannot be determined to be inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* and it has not been determined that the reactor will remain shutdown under all conditions without boron, enter Contingency #5.
- RPV water level cannot be determined, enter Contingency #4.
- RPV water level is rising, enter RPV Control at Step RC/L.
- RPV water level drops below 17.8 in. *(ADS initiation setpoint)*, place the ADS logic inhibit switches in ON.

Appendix A. Section: Contingency #1

BWROG EPG STEP

If while executing the following steps:

- Any control rod cannot be determined to be inserted to or beyond position [02 (Maximum Subcritical Banked Withdrawal Position)] and it has not been determined that the reactor will remain shutdown under all conditions without boron, enter [procedure developed from Contingency #5].
- RPV water level cannot be determined, enter [procedure developed from Contingency #4].
- RPV water level is increasing, enter [procedure developed from the RPV Control Guideline] at [Step RC/L].
- RPV water level drops below [-146 in. (ADS initiation setpoint)], prevent automatic initiation of ADS.

DEVIATIONS

- The word "increasing was replaced with "rising".

  Plant specific terminology.

- The words "prevent automatic initiation of ADS" were replaced with "place the ADS logic inhibit switches in ON.

  Placing the ADS logic inhibit switches in ON is the NMP2 specific method for preventing automatic initiation of ADS.

- "Procedure developed from RPV Control Guideline" was replaced with "RPV CONtrol".

  At NMP2, the procedure developed from "RPV Control Guideline" is called "RPV Control".

EOP VARIANCE

- The step concerning inhibiting ADS was removed from the override statement and became a separate step to always inhibit ADS when this procedure is entered. In order to enter this procedure, a determination was already made that water level cannot be maintained above the top of active fuel, therefore, the operators have already passed through RPV level 1 or anticipate to do so.

- Phrases concerning control rods and boron were simplified to facilitate easier procedure use.

NMP2 PSTG STEP

If while executing the following steps primary containment water level and suppression chamber pressure cannot be maintained below the Maximum Primary Containment Water Level Limit, then irrespective of whether adequate core cooling is assured terminate injection into the primary containment from sources external to the primary containment until primary containment water level and suppression chamber pressure can be maintained below the Maximum Primary Containment Water Level Limit.

BWROG EPG STEP

If while executing the following steps primary containment water level and suppression chamber pressure cannot be maintained below the Maximum Primary Containment Water Level Limit, then irrespective of whether adequate core cooling is assured terminate injection into the RPV from sources external to the primary containment until primary containment water level and suppression chamber pressure can be maintained below the Maximum Primary Containment Water Level Limit.

Appendix A. Section: Contingency #1

DEVIATIONS

The direction to "terminate injection into the RPV from....." was replaced with "terminate injection into the Primary Containment from.....".

In accordance with the BWROG EPG ISSUES RESOLUTION FILE 8903.

EOP VARIANCE

Values identified at break points on the MPCWLL curve were rounded in the conservative direction to be consistent with control room instrument readability.

NMP2 PSTG STEP

Not Applicable.

BWROG EPG STEP

C1-1 Initiate IC.

DEVIATIONS

- "Initiate IC" was deleted.

  NMP2 does not have an IC.

- PSTG step numbers are not consistent with the EPG's.

  This is due to the omission of step C1-1.

EOP VARIANCE

None.

NMP2 PSTG STEP

C1-1 Line up for injection, start pumps, and irrespective of pump NPSH and vortex limits, raise injection flow to the maximum with 2 or more of the following injection subsystems:

- Condensate
- HPCS
- LPCI-A with injection through the heat exchanger as soon as possible.
- LPCI-B with injection through the heat exchanger as soon as possible.
- LPCI-C
- LPCS

BWROG EPG STEP

C1-2 Line up for injection, start pumps, and irrespective of pump NPSH and vortex limits, increase injection flow to the maximum with 2 or more of the following injection subsystems:

- Condensate
- HPCS
- LPCI-A with injection through the heat exchanger as soon as possible.
- LPCI-B with injection through the heat exchanger as soon as possible.
- LPCI-C with injection through the heat exchanger as soon as possible.
- LPCS-A
- LPCS-B

DEVIATIONS

- The instruction to "increase" injection flow was replaced with "raise" injection flow.

  Plant specific terminology.

- The direction to inject through the heat exchanger as soon as possible when using subsystem LPCI-C was deleted.

  NMP2 does not have a heat exchanger on LPCI-C.

- "LPCS-A" and "LPCS-B" were combined into "LPCS".

  NMP2 has only one LPCS loop.

- PSTG step numbers are not consistent with the EPG's.

  This is due to the omission of step C1-1.

EOP VARIANCE

None.

NMP2 PSTG STEP

If less than 2 of the injection subsystems can be lined up, commence lining up as many of the following alternate injection subsystems as possible:

- RHR service water crosstie
- Fire system
- ECCS keep full systems
- SLC (test tank)
- SLC (boron tank)
- Condensate transfer

BWROG EPG STEP

If less than 2 of the injection subsystems can be lined up, commence lining up as many of the following alternate injection subsystems as possible:

[• RHR service water crosstie]

[• Fire system]

[• Interconnections with other units]

[• ECCS keep-full systems]

[• SLC (test tank)]

[• SLC (boron tank)]

Appendix A. Section: Contingency #1

DEVIATIONS

- Condensate Transfer was added to the list of alternate injection subsystems.

  At NMP2 Condensate Transfer provides an alternate injection source through ECCS systems.

- "Inter-connections with other units" was deleted.

  NMP2 has no other interconnections with other units other than fire water which is already listed.

EOP VARIANCE

- Plant specific procedure references were added to facilitate their use.

- The word "injection" was omitted to simplify the procedure.

NMP2 PSTG STEP

C1-2 If RPV pressure is above 195 psig *(highest RPV pressure at which the shutoff head of a low-water-quality alternate injection subsystem (excluding SLC) is reached)*:

BWROG EPG STEP

C1-3 If RPV pressure is above [87 psig (highest RPV pressure at which the shutoff head of a low-water-quality alternate injection subsystem (excluding SLC) is reached)]:

DEVIATIONS

PSTG step numbers are not consistent with the EPG's.

This is due to the omission of step C1-1.

EOP VARIANCE

None.

NMP2 PSTG STEP

If while executing the following steps RPV pressure drops below 195 psig *(highest RPV pressure at which the shutoff head of a low-water-quality alternate injection subsystem (excluding SLC) is reached)*, continue in this procedure at Step C1-3.

BWROG EPG STEP

If while executing the following steps RPV pressure drops below [87 psig (highest RPV pressure at which the shutoff head of a low-water-quality alternate injection subsystem (excluding SLC) is reached)], continue in this procedure at [Step C1-4]

DEVIATIONS

PSTG step numbers are not consistent with the EPG's.

This is due to the omission of step C1-1.

EOP VARIANCE

None.

NMP2 PSTG STEP

C1-2.1 If no injection subsystem is lined up for injection with at least one pump running, start pumps in alternate injection subsystems which are lined up for injection.

C1-2.2 When RPV water level drops to -14.4 in. *(top of active fuel)*:

- If any system, injection subsystem or alternate injection subsystem is lined up with at least one pump running, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.
- If no system, injection subsystem or alternate injection subsystem is lined up with at least one pump running, STEAM COOLING IS REQUIRED.

BWROG EPG STEP

C1-3.1 If no injection subsystem is lined up for injection with at least one pump running, start pumps in alternate injection subsystems which are lined up for injection.

C1-3.2 When RPV water level drops to [-164 in. (top of active fuel)]:

- If any system, injection subsystem or alternate injection subsystem is lined up with at least one pump running, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.
- If no system, injection subsystem or alternate injection subsystem is lined up with at least one pump running, STEAM COOLING IS REQUIRED.

DEVIATIONS

PSTG step numbers are not consistent with the EPG's.

This is due to the omission of step C1-1.

EOP VARIANCE

- The word "injection" was omitted in order to simplify the procedure.

- "System, injection subsystem, and alternate injection subsystem" were replaced with "any source of RPV injection" in order to simplify the procedure.

NMP2 PSTG STEP

C1-3 When RPV pressure drops below 195 psig *(highest RPV pressure at which the shutoff head of a low-water-quality alternate injection subsystem (excluding SLC) is reached)*:

C1-3.1 Line up for injection, start pumps, and irrespective of pump NPSH and vortex limits, raise injection flow to the maximum with all systems and injection subsystems.

C1-3.2 When RPV water level drops to -14.4 in. *(top of active fuel)*, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; line up for injection, start pumps, and raise injection flow to the maximum with all alternate injection subsystems.

If RPV water level cannot be restored and maintained above -14.4 in. *(top of active fuel)*, PRIMARY CONTAINMENT FLOODING IS REQUIRED; enter Contingency # 6.

BWROG EPG STEP

C1-4 When RPV pressure drops below [87 psig (highest RPV pressure at which the shutoff head of a low-water-quality alternate injection subsystem (excluding SLC) is reached)]:

C1-4.1 Line up for injection, start pumps, and irrespective of pump NPSH and vortex limits, increase injection flow to the maximum with all systems and injection subsystems.

C1-4.2 When RPV water level drops to [-164 in. (top of active fuel)], EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; line up for injection, start pumps, and increase injection flow to the maximum with all alternate injection subsystems.

If RPV water level cannot be restored and maintained above [-164 in. (top of active fuel)], PRIMARY CONTAINMENT FLOODING IS REQUIRED; enter [procedure developed from Contingency #6].

Appendix A. Section: Contingency #1

DEVIATIONS

- The word "increase" was replaced with "raise".

  Plant specific terminology.

- PSTG step numbers are not consistent with the EPG's.

  This is due to the omission of step C1-1.

- "Procedure developed from contingency #6" was replaced with "Contingency #6"

  At NMP2, the procedure developed from

EOP VARIANCE

- The "when" portion of this step does not appear in the flowchart as it is already included in either the previous override or the "no" exit from the decision step asking "is RPV pressure above 195 psig".

- The word "injection" was omitted to simplify the procedure.

Appendix A, Section: Contingency #2

NMP2 PSTG STEP

C2-1 When either: 6

- All control rods can be determined to be inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)*, or
- It has been determined that the reactor will remain shutdown under all conditions without boron, or
- All injection into the RPV except from boron injection systems, CRD, and RCIC has been terminated and prevented,

BWROG EPG STEP

C2-1 When either: 5 2

- Any control rod cannot be determined to be inserted to or beyond position [02 (Maximum Subcritical Banked Withdrawal Position)] and it has not been determined that the reactor will remain shutdown under all conditions without boron and all injection into the RPV except from boron injection systems, CRD and RCIC has been terminated and prevented, or
- All control rods are inserted to or beyond position [02 (Maximum Subcritical Banked Withdrawal Position)] or it has been determined that the reactor will remain shutdown under all conditions without boron,

Appendix A. Section: Contingency #2

DEVIATIONS

- This paragraph was reworded but the intent of the EPG remains unchanged.

  In accordance with BWROG EPG Issues Resolution File No. 8912.

- Caution # 2 was omitted from the PSTG.

  NMP2 does not have heated reference legs, therefore, Caution # 2 does not apply.

EOP VARIANCE

The flowchart incorporates Caution # 6 directly into the elements to which it applies. This will better call the operators' attention to it whenever it applies.

NMP2 PSTG STEP

C2-1.1 If a high drywell pressure ECCS initiation signal (1.68 psig *(drywell pressure which initiates ECCS)*) exists, prevent injection from those LPCS and LPCI pumps not required to assure adequate core cooling.

BWROG EPG STEP

C2-1.1 If a high drywell pressure ECCS initiation signal [2.0 psig (drywell pressure which initiates ECCS)] exists, prevent injection from those LPCS and LPCI pumps not required to assure adequate core cooling.

DEVIATIONS

None.

EOP VARIANCE

~~None.~~ The flowchart has been formatted such that this decision and action is in a parallel path with the ATWS decisions. This is done to prevent redundant steps in the ATWS decisions, since if you had to wait to terminate injection there, this question and action would be redundant.

NMP2 PSTG STEP

Not applicable.

BWROG EPG STEP

C2-1.2 Initiate IC.

DEVIATIONS

"Initiate IC" was deleted.

NMP2 does not have an IC.

EOP VARIANCE

None.

NMP2 PSTG STEP

C2-1.2 If suppression pool water level is above 192 ft. *(lowest instrumented suppression pool water level)*:

- Open all ADS valves.
- If any ADS valve cannot be opened, open other SRVs until 7 *(number of SRVs dedicated to ADS)* valves are open.

BWROG EPG STEP

C2-1.3 If suppression pool water level is above [4 ft 9 in. (elevation of top of SRV discharge device)]:

- Open all ADS valves.
- If any ADS valve cannot be opened, open other SRVs until [7 (number of SRVs dedicated to ADS)] valves are open.

DEVIATIONS

- The reference to the elevation of the top of the SRV discharge device was replaced with the elevation of the lowest instrumented suppression pool water level indication.

  The range of suppression pool water level instrumentation does not extend down to the elevation of the SRV discharge device. This substitution eliminates the possibility of discharging the SRVs into the suppression chamber air space. El. 192 ft. is the lowest instrumented suppression pool water level.

- PSTG step numbers are not consistent with the EPG's.

  This is due to the omission of step C2-1.2.

EOP VARIANCE

None.

NMP2 PSTG STEP

C2-1.3 If less than 4 *(Minimum Number of SRVs Required for Emergency Depressurization)* SRVs are open, rapidly depressurize the RPV, defeating isolation interlocks if necessary, using one or more of the following:

- Main condenser
- RHR (steam condensing mode)
- Main steam line drains
- RCIC steam line
- Head vent

BWROG EPG STEP

C2-1.4 If less than [4 (Minimum Number of SRVs Required for Emergency Depressurization)] SRVs are open [and RPV pressure is at least 50 psig (Minimum SRV Reopening Pressure) above suppression chamber pressure], rapidly depressurize the RPV, defeating isolation interlocks if necessary, using one or more of the following:

- Main condenser
- RHR (steam condensing mode)
- [Other steam driven equipment]
- Main steam line drains
- HPCI steam line
- RCIC steam line
- Head vent
- IC tube side vent

Appendix A. Section: Contingency #2

DEVIATIONS

- HPCI and IC tube side vent were deleted from the list of options to depressurize the RPV.

  NMP2 does not have HPCI and IC.

- PSTG step numbers are not consistent with the EPG's.

  This is due to the omission of step C2-1.2.

- The words "and RPV pressure is at least 50 psig (Minimum SRV Reopening Pressure) were deleted.

  At NMP2, the Minimum SRV Reopening Pressure is 0 psig, therefore this step is not required.

- The words "other steam driven equipment" were deleted.

  NMP2 does not have other steam driven equipment.

EOP VARIANCE

- Plant specific procedure references were added to facilitate their use.

- The word "all" was added to the EOP to emphasize the significance of this step.

NMP2 PSTG STEP

> If RPV water level cannot be determined, enter Contingency #4.

C2-2 When either:

- All control rods are inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)*, or
- It has been determined that the reactor will remain shutdown under all conditions without boron, or
- 769 pounds *(Cold Shutdown Boron Weight)* of boron have been injected into the RPV, or
- The reactor is shutdown and no boron has been injected into the RPV,

Enter RPV control at Step RC/P-4.

BWROG EPG STEP

> If RPV water level cannot be determined, enter [procedure developed from Contingency #4].

C2-2 When either:

- All control rods are inserted to or beyond position [02 (Maximum Subcritical Banked Withdrawal Position)], or
- It has been determined that the reactor will remain shutdown under all conditions without boron, or
- [700 pounds (Cold Shutdown Boron Weight)] of boron have been injected into the RPV, or
- The reactor is shutdown and no boron has been injected into the RPV, enter [procedure developed from the RPV Control Guideline] at [Step RC/P-4].

Appendix A. Section: Contingency #2

DEVIATIONS

- "Procedure developed from Contingency # 4" was replaced with "Contingency # 4".

  At NMP2, the procedure developed from Contingency # 4 is called Contingency # 4.

- "Procedure developed from RPV Control Guideline" was replaced with "RPV Control".

  At NMP2, the procedure developed from RPV Control Guideline is called RPV Control.

EOP VARIANCE

- Words concerning control rods and boron were revised for simplification.

- The words "while executing the following steps" were added to the flowchart and formatted as an override to ensure that while the operators wait for the reactor to shutdown, and RPV water level cannot be determined, the RPV flooding EOP is entered. Note that while the EPG and PSTG are formatted as an override they do not include these words.

- The flowchart calls for injecting SLS until the solution's volume in the tank is reduced to 900 gallons while the PSTG calls for injecting 769 pounds of boron. Injecting 769 pounds of boron will result in 900 gallons left in the tank (after rounding the number of gallons in the conservative direction to be consistent with control room instrument readability).

- The quantity 769 pounds is also retained on the flowchart in case an alternate SLC injection method which does not use the SLC tank is required (RWCU).

- The words "into the RPV" were omitted from the flowchart for simplification.

NMP2 PSTG STEP

Not applicable.

BWROG EPG STEP

C3-1 Confirm initiation of IC.

DEVIATIONS

The direction to confirm initiation of IC was deleted.

NMP2 does not have an IC.

EOP VARIANCE

None.

NMP2 PSTG STEP

> If while executing this step Emergency RPV Depressurization is required, RPV water level cannot be determined, or any system, injection subsystem, or alternate injection subsystem is lined up for injection with at least one pump running, enter Contingency #2.

BWROG EPG STEP

> If while executing this step Emergency RPV Depressurization is required, RPV water level cannot be determined, or any system, injection subsystem, or alternate injection subsystem is lined up for injection with at least one pump running, enter [procedure developed from Contingency #2].

Appendix A. Section: Contingency #3

DEVIATIONS

"Procedure developed from Contingency # 2" was replaced with "Contingency # 2".

At NMP2, the procedure developed from Contingency # 2 is called Contingency # 2.

EOP VARIANCE

- The word "step was replaced with the word "procedure" since this is applicable to the entire procedure. In the PSTG, C-3 is a single step procedure while in the EOP, C-3 is a four element procedure.

- Words concerning injection sources were simplified to facilitate procedure use.

Appendix A. Section: Contingency #3

NMP2 PSTG STEP

C3-1 When RPV water level drops to -58.2 in. *(Minimum Zero Injection RPV Water Level)* enter Contingency #2.

BWROG EPG STEP

If IC cannot be initiated, when RPV water level drops to [-208 in. (Minimum Zero-Injection RPV Water Level)] enter [procedure developed from Contingency #2].

DEVIATIONS

The words "if IC cannot be initiated" were deleted.

NMP2 does not have an IC.

EOP VARIANCE

- Minimum zero injection RPV water level was conservatively rounded to be consistent with readability of control room instruments.

- A note was added to remind the operators that while in this procedure pressure is controlled by the SRVs in Auto.

NMP2 PSTG STEP

If while executing the following steps RPV water level can be determined:

- If any control rod cannot be determined to be inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* and it has not been determined that the reactor will remain shutdown under all conditions without boron, enter Contingency #5 and RPV Control at Step RC/P-4 and execute these procedures concurrently.
- If all control rods are inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* or it has been determined that the reactor will remain shutdown under all conditions without boron, enter RPV Control at Steps RC/L and RC/P-4 and execute these steps concurrently.

BWROG EPG STEP

If while executing the following steps RPV water level can be determined:

- If any control rod cannot be determined to be inserted to or beyond position [02 (Maximum Subcritical Banked Withdrawal Position)] and it has not been determined that the reactor will remain shutdown under all conditions without boron, enter [procedure developed from Contingency #5] and [procedure developed from RPV Control Guideline] at [Step RC/P-4] and execute these procedures concurrently.
- If all control rods are inserted to or beyond position [02 (Maximum Subcritical Banked Withdrawal Position)] or it has been determined that the reactor will remain shutdown under all conditions without boron, enter [procedure developed from the RPV Control Guideline] at [Steps RC/L and RC/P-4] and execute these steps concurrently.

Appendix A, Section: Contingency #4

DEVIATION

"Procedure developed from Contingency # 5" and Procedure developed from RPV Control Guideline" were replaced with "Contingency # 5" and RPV Control respectively.

At NMP2, the procedure developed from Contingency # 5 is called Contingency # 5, and the procedure developed from RPV Control Guideline is called RPV Control.

EOP VARIANCE

- Words concerning control rods and boron were simplified to facilitate procedure use.

- The word "step" was replaced with "procedure" to eliminate any potential confusion.

- A note was added to remind the operator that while in this contingency, Emergency Depressurization should be performed if not already done.

Appendix A. Section: Contingency #4

NMP2 PSTG STEP

If while executing the following steps primary containment water level and suppression chamber pressure cannot be maintained below the Maximum Primary Containment Water Level Limit, then irrespective of whether adequate core cooling is assured, terminate injection into the Primary Containment from sources external to the Primary Containment until primary containment water level and suppression chamber pressure can be maintained below the Maximum Primary Containment Water Level Limit.

BWROG EPG STEP

If while executing the following steps primary containment water level and suppression chamber pressure cannot be maintained below the Maximum Primary Containment Water Level Limit, then irrespective of whether adequate core cooling is assured terminate injection into the RPV from sources external to the primary containment until primary containment water level and suppression chamber pressure can be maintained below the Maximum Primary Containment Water Level Limit.

Appendix A. Section: Contingency #4

DEVIATION

The direction to "terminate injection into the RPV from sources ...." was replaced with "terminate injection into the Primary Containment from sources ...."

In accordance with the BWROG EPG Issues Resolution File No. 8903

EOP VARIANCE

- MPCWLL break point values were rounded in the conservative direction to be consistent with control room instrument readability.

- The word "curve" replaces "Maximum Primary Containment Water Level Limit" for simplification.

NMP2 PSTG STEP

C4-1 If any control rod cannot be determined to be inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* and it has not been determined that the reactor will remain shutdown under all conditions without boron, flood the RPV as follows:

BWROG EPG STEP

C4-1 If any control rod cannot be determined to be inserted to or beyond position [02 (Maximum Subcritical Banked Withdrawal Position)] and it has not been determined that the reactor will remain shutdown under all conditions without boron, flood the RPV as follows:

DEVIATION

None.

EOP VARIANCE

Words concerning control rods and boron were simplified to facilitate procedure use.

NMP2 PSTG STEP

If while executing the following steps either all control rods are inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* or it has been determined that the reactor will remain shutdown under all conditions without boron but RPV water level cannot be determined, continue in this procedure at Step C4-2.

BWROG EPG STEP

If while executing the following steps either all control rods are inserted to or beyond position [02 (Maximum Subcritical Banked Withdrawal Position)] or it has been determined that the reactor will remain shutdown under all conditions without boron but RPV water level cannot be determined, continue in this procedure at [Step C4-2].

DEVIATION

None.

EOP VARIANCE

Words concerning control rods and boron were simplified to facilitate procedure use.

NMP2 PSTG STEP

C4-1.1 Terminate and prevent all injection into the RPV except from boron injection systems and CRD until RPV pressure is below the Minimum Alternate RPV Flooding Pressure.

NUMBER OF OPEN SRVs	MINIMUM ALTERNATE RPV FLOODING PRESSURE (psig)
7 or more	135
6	160
5	195
4	247
3	334
2	508
1	1031

If less than 1 *(minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)* SRV can be opened, continue in this procedure.

BWROG EPG STEP

C4-1.1 Terminate and prevent all injection into the RPV except from boron injection systems and CRD until RPV pressure is below the Minimum Alternate RPV Flooding Pressure.

Number of open SRVs	Minimum Alternate RPV Flooding Pressure (psig)
[7 or more	94]
[6	112]
[5	137]
[4	175]
[3	238]
[2	364]
[1	743]

If less than [1 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)] SRV[s] can be opened, continue in this procedure.

DEVIATION

None.

EOP VARIANCE

- The numbers in the EOP table were rounded to the nearest significant digit. Different plant conditions may result in opposing conservative directions. Therefore the numbers were not rounded to be consistent with control room instrument readability.

- The MARFP table is called a "Figure" to eliminate potential confusion with the numbering system of tables and figures.

Appendix A. Section: Contingency #4

NMP2 PSTG STEP

C4-1.2 If at least 4 *(Minimum Number of SRVs Required for Emergency Depressurization)* SRVs can be opened, close the MSIVs, main steam line drain valves, RCIC and RHR steam condensing isolation valves.

BWROG EPG STEP

C4-1.2 If at least [4 (Minimum Number of SRVs Required for Emergency Depressurization)] SRVs can be opened, close the MSIVs, main steam line drain valves, and IC, RCIC and RHR steam condensing isolation valves.

DEVIATION

The direction to close IC was deleted.

NMP2 does not have an IC.

EOP VARIANCE

None.

NMP2 PSTG STEP

C4-1.3 Commence and slowly raise injection into the RPV with the following systems until at least 1 *(minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)* SRV is open and RPV pressure is above the Minimum Alternate RPV Flooding Pressure: 7

- Feedwater pumps, defeating high RPV water level trip interlocks if necessary
- Condensate pumps
- CRD

If less than 1 *(minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)* SRV is open or RPV pressure cannot be raised to above the Minimum Alternate RPV Flooding Pressure, commence and, irrespective of pump NPSH and vortex limits, slowly raise injection into the RPV with the following systems until at least 1 *(minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)* SRV is open and RPV pressure is above the Minimum Alternate RPV Flooding Pressure:

- HPCS, defeating high RPV water level isolation interlocks if necessary.
- LPCS
- LPCI, with injection through the heat exchangers as soon as possible.
- RHR Service water crosstie
- Fire system
- ECCS keep-full systems
- Condensate transfer

BWROG EPG STEP

C4-1.3 Commence and, irrespective of pump NPSH and vortex limits, slowly increase injection into the RPV with the following systems until at least 1 *(minimum number of SRVs for which the Minimum Alternate RPV Flooding* Pressure is below the lowest SRV lifting pressure)] SRV[s] [is] open and RPV pressure is above the Minimum Alternate RPV Flooding Pressure: 7

- Motor driven feedwater pumps, defeating high RPV water level isolation interlocks if necessary.
- Condensate pumps
- CRD

[• LPCI with injection through the heat exchangers as soon as possible.]

If less than [1 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)] SRV[s] [is] open or RPV pressure cannot be increased to above the Minimum Alternate RPV Flooding Pressure, commence and, irrespective of pump NPSH and vortex limits, slowly increase injection into the RPV with the following systems until at least [1 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)] SRV[s] [is] open and RPV pressure is above the Minimum Alternate RPV Flooding Pressure:

- HPCS, defeating high RPV water level isolation interlocks if necessary.
- LPCS

[• RHR service water crosstie]

[• Fire System]

[• Interconnections with other units]

[• ECCS keep-full systems]

Appendix A. Section: Contingency #4

DEVIATION

- The words "motor driven feedwater pumps" were replaced with "feedwater pumps".

  All NMP2 feedwater pumps are motor driven.

- The words "isolation interlocks" were replaced with "trip interlocks".

  NMP2's feedwater pumps have high RPV water level trip interlocks rather than isolation interlocks.

- LPCI was added to the list of optional systems

  At NMP2 LPCI injects inside the shroud.

- The word "increase" was replaced with "raise".

  Plant specific terminology.

- Condensate Transfer was added to the list of alternate injection subsystems.

  At NMP2 Condensate Transfer provides an alternate injection source through ECCS systems.

- The words "irrespective of pump NPSH and vortex limits" were deleted.

  At NMP2, neither NPSH nor vortex limits were established for Feedwater, condensate, and CRD pumps.

(Continued next page)

DEVIATION (Continued from previous page)

- The words "LPCI with injection through the heat exchangers as soon as possible" were deleted.

  At NMP2, LPCI injects inside the shroud. The intent of this step is to list motor operated systems which inject outside the shroud (Reference: EPG Appendix B, page B-13-27).

- The words "interconnections with other units" were deleted.

  Other Fire system, which is already listed, NMP2 has no interconnections with other units.

EOP VARIANCE

Plant specific procedure reference was added to facilitate its use.

NMP2 PSTG STEP

If less than 1 *(minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)* SRV is open or RPV pressure cannot be raised to above the Minimum Alternate RPV Flooding Pressure, PRIMARY CONTAINMENT FLOODING IS REQUIRED, enter Contingency #6 and RPV Control at Step RC/P-4 and execute these procedures concurrently.

BWROG EPG STEP

If less than [1 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)] SRV[s] [is] open or RPV pressure cannot be increased to above the Minimum Alternate RPV Flooding Pressure, enter [procedure developed from Contingency #6] and [procedure developed from the RPV Control Guideline] at [Step RC/P-4] and execute these procedures concurrently.

Appendix A, Section: Contingency #4

DEVIATION

- The word "increased was replaced with "raised".

  Plant specific terminology.

- The words "PRIMARY CONTAINMENT FLOODING IS REQUIRED" were added.

  In accordance with BWROG EPG Issues Resolution File No. 8931. This addition ensures that suppression pool level control is transferred from SP/L when the primary containment is to be flooded. Also, see EPG Appendix B page B-7-73.

- "Procedure developed from Contingency # 6" and Procedure developed from RPV Control Guideline" were replaced with "Contingency # 6" and RPV Control respectively.

  At NMP2, the procedure developed from Contingency # 6 is called Contingency # 6, and the procedure developed from RPV Control Guideline is called RPV Control.

EOP VARIANCE

None.

NMP2 PSTG STEP

C4-1.4 When at least 1 *(minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)* SRV is open and RPV pressure is above the Minimum Alternate RPV Flooding Pressure, control injection to maintain at least 1 *(minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)* SRV open and RPV pressure above the Minimum Alternate RPV Flooding Pressure but as low as practicable.

BWROG EPG STEP

C4-1.4 When at least [1 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)] SRV[s] [is] open and RPV pressure is above the Minimum Alternate RPV Flooding Pressure, control injection to maintain at least [1 (minimum number of SRVs for which the Minimum Alternate Flooding Pressure is below the lowest SRV lifting pressure)] SRV[s] open and RPV pressure above the Minimum Alternate RPV Flooding Pressure but as low as practicable.

DEVIATION

None.

EOP VARIANCE

~~None.~~

The flowchart does not use the words " when at least .... RPV Flooding Pressure ", These are covered by the previous two flowchart elements of the procedure.

Appendix A. Section: Contingency #4

NMP2 PSTG STEP

C4-1.5 When all control rods are inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* or it has been determined that the reactor will remain shutdown under all conditions without boron, continue in this procedure.

BWROG EPG STEP

C4-1.5 When all control rods are inserted to or beyond position [02 (Maximum Subcritical Banked Withdrawal Position)] or it has been determined that the reactor will remain shutdown under all conditions without boron, continue in this procedure.

DEVIATION

None.

EOP VARIANCE

Words concerning control rods and boron were simplified to facilitate procedure use.

NMP2 PSTG STEP

C4-2 If at least 4 *(Minimum Number of SRVs Required for Emergency Depressurization)* SRVs can be opened or if a HPCS or feedwater pump is available for injection, close the MSIVs, main steam line drain valves, RCIC and RHR steam condensing isolation valves.

BWROG EPG STEP

C4-2 If at least [4 (Minimum Number of SRVs Required for Emergency Depressurization)] SRVs can be opened or if a HPCS or motor driven feedwater pump is available for injection, close the MSIVs, main steam line drain valves, and IC, RCIC and RHR steam condensing isolation valves.

DEVIATION

- The words "motor driven feedwater pumps" were replaced with "feedwater pumps".

  All NMP2 feedwater pumps are motor driven.

- The direction to close IC was deleted.

  NMP2 does not have an IC.

EOP VARIANCE

None.

NMP2 PSTG STEP

C4-3 Flood the RPV as follows:

C4-3.1 Commence and, irrespective of pump NPSH and vortex limits, raise injection into the RPV with the following systems until at least 4 *(Minimum Number of SRVs Required for Emergency Depressurization)* SRVs are open and RPV pressure is not dropping and is 61 psig *(Minimum RPV Flooding Pressure)* or more above suppression chamber pressure:

- HPCS, defeating high RPV water level isolation interlocks if necessary.
- Feedwater pumps, defeating high RPV water level trip interlocks if necessary.
- LPCS
- LPCI with injection through the heat exchangers as soon as possible.
- Condensate pumps
- CRD
- RHR service water crosstie
- Fire system
- ECCS keep-full system
- SLC (test tank)
- SLC (boron tank)
- Condensate transfer

BWROG EPG STEP

C4-3 Flood the RPV as follows:

C4-3.1 Commence and, irrespective of pump NPSH and vortex limits, increase injection into the RPV with the following systems until at least [4 (Minimum Number of SRVs Required for Emergency Depressurization)] SRVs are open and RPV pressure is not decreasing and is [50 psig (Minimum RPV Flooding Pressure)] or more above suppression chamber pressure:

- HPCS, defeating high RPV water level isolation interlocks if necessary.
- Motor driven feedwater pumps, defeating high RPV water level isolation interlocks if necessary.
- LPCS
- LPCI with injection through the heat exchangers as soon as possible.
- Condensate pumps
- CRD

[• RHR service water crosstie]

[• Fire System]

[• Interconnections with other units]

[• ECCS keep-full systems]

[• SLC (test tank)]

[• SLC (boron tank)]

Appendix A. Section: Contingency #4

DEVIATION

- The words "motor driven feedwater pumps" were replaced with "feedwater pumps".

  All NMP2 feedwater pumps are motor driven.

- The words "isolation interlocks" were replaced with "trip interlocks".

  NMP2's feedwater pumps have high RPV water level trip interlocks rather than isolation interlocks.

- The word "increase" was replaced with "raise".

  Plant specific terminology.

- Condensate Transfer was added to the list of alternate injection subsystems.

  At NMP2 Condensate Transfer provides an alternate injection source through ECCS systems.

- "Dropping" replaces "decreasing"

  Plant specific terminology.

- The words "interconnections with other units" were deleted.

  Other Fire system, which is already listed, NMP2 has no interconnections with other units.

Appendix A. Section: Contingency #4

EOP VARIANCE

- Plant specific procedure reference were added to facilitate their use.

- Added a spot for the operator to record required information while implementing this step.

NMP2 PSTG STEP

If less than 4 *(Minimum Number of SRVs Required for Emergency Depressurization)* SRVs are open or RPV pressure cannot be maintained at least 61 psig *(Minimum RPV Flooding Pressure)* above suppression chamber pressure, PRIMARY CONTAINMENT FLOODING IS REQUIRED, enter Contingency #6 and RPV Control at Step.RC/P-4 and execute these procedures concurrently.

BWROG EPG STEP

If less than [4 (Minimum Number of SRVs Required for Emergency Depressurization)] SRV[s] are open or RPV pressure cannot be maintained at least [50 psig (Minimum RPV Flooding Pressure)] above suppression chamber pressure, enter [procedure developed from Contingency #6] and [procedure developed from the RPV Control Guideline] at [Step RC/P-4] and execute these procedures concurrently.

Appendix A. Section: Contingency #4

DEVIATION

- The words "PRIMARY CONTAINMENT FLOODING IS REQUIRED" were added.

  In accordance with BWROG EPG Issues Resolution File No. 8931. This addition ensures that suppression pool level control is transferred from SP/L when the primary containment is to be flooded. Also, see EPG Appendix B page B-7-73.

- "Procedure developed from Contingency # 6" and Procedure developed from RPV Control Guideline" were replaced with "Contingency # 6" and "RPV Control" respectively.

  At NMP2, the procedure developed from Contingency # 6 is called Contingency # 6, and the procedure developed from RPV Control Guideline is called RPV Control.

EOP VARIANCE

None.

NMP2 PSTG STEP

C4-3.2 When at least 4 *(Minimum Number of SRVs Required for Emergency Depressurization)* SRVs are open and RPV pressure can be maintained at least 61 psig *(Minimum RPV Flooding Pressure)* above suppression chamber pressure, control injection to maintain at least 4 *(Minimum Number of SRVs Required for Emergency Depressurization)* SRVs open and RPV pressure at least 61 psig *(Minimum RPV Flooding Pressure)* above suppression chamber pressure but as low as practicable.

BWROG EPG STEP

C4-3.2 When at least [4 (Minimum Number of SRVs Required for Emergency Depressurization)] SRV[s] are open and RPV pressure can be maintained at least [50 psig (Minimum RPV Flooding Pressure)] above suppression chamber pressure, control injection to maintain at least [4 (Minimum Number of SRVs Required for Emergency Depressurization)] SRVs open and RPV pressure at least [50 psig (Minimum RPV Flooding Pressure)] above suppression chamber pressure but as low as practicable.

DEVIATION

None.

EOP VARIANCE

None.

NMP2 PSTG STEP

C4-4 When:

- RPV water level instrumentation is available, and
- Hottest drywell temperature is below 212°F, and
- RPV pressure has remained at least 61 psig *(Minimum RPV Flooding Pressure)* above suppression chamber pressure for at least the Minimum Core Flooding Interval:

Number of Open SRVs	Minimum Core Flooding Interval (min)
7 or more	22.71
6	31.46
5	48.23
4	81.95

Terminate all injection into the RPV and reduce RPV water level until RPV water level indication is restored.

If RPV water level indication is not restored within the Maximum Core Uncovery Time Limit after commencing termination of injection into the RPV, return to Step C4-3.1.

Appendix A, Section: Contingency #4

BWROG EPG STEP

C4-4 When:

- RPV water level instrumentation is available, and
- Temperature[s] [near the cold reference leg instrument vertical runs] are below 212°F, and
- RPV pressure has remained at least [50 psig (Minimum RPV Flooding Pressure)] above suppression chamber pressure for at least [the Minimum Core Flooding Interval]

Number of open SRVs	Minimum Core Flooding Interval (min)
[7 or more	21]
[6	29]
[5	43]
[4	72]

Terminate all injection into the RPV and reduce RPV water level until RPV water level indication is restored.

If RPV water level indication is not restored within the Maximum Core Uncovery Time Limit after commencing termination of injection into the RPV, return to [Step C4-3.1].

Appendix A. Section: Contingency #4

DEVIATION

"Hottest drywell temperature" is used in lieu of "Temperatures near the cold reference leg instrument runs".

No indication of drywell temperature near RPV water level instrument vertical runs is provided at NMP2. Therefore, the hottest drywell temperature is a conservative substitute.

EOP VARIANCE

- Values in the Minimum Core Flooding Interval table were rounded up in the conservative direction to the nearest whole minute.

- An operator aid was added for recording information required to complete this step.

NMP2 PSTG STEP

C4-5 Enter RPV Control at Steps RC/L and RC/P-4 and execute these steps concurrently.

BWROG EPG STEP

C4-5 Enter [procedure developed from the RPV Control Guideline] at [Steps RC/L and RC/P-4] and execute these steps concurrently.

DEVIATION

"Procedure developed from RPV Control Guideline" was replaced with "RPV Control".

At NMP2, the procedure developed from RPV Control Guideline is called RPV Control.

EOP VARIANCE

None.

Appendix A. Section: Contingency #5

NMP2 PSTG STEP

If while executing the following steps:

- RPV water level cannot be determined, enter Contingency #4.
- All control rods are inserted to or beyond position 02 *(Maximum Subcritical Banked Withdrawal Position)* or it has been determined that the reactor will remain shutdown under all conditions without boron, enter RPV Control at Step RC/L.
- Primary containment water level and suppression chamber pressure cannot be maintained below the Maximum Primary Containment Water Level Limit, then irrespective of whether adequate core cooling is assured terminate injection into the Primary Containment from sources external to the primary containment until Primary Containment water level and suppression chamber pressure can be maintained below the Maximum Primary Containment Water Level Limit.

BWROG EPG STEP

If while executing the following steps:

RPV water level cannot be determined, enter [procedure developed from Contingency #4].

All control rods are inserted to or beyond position [02 (Maximum Subcritical Banked Withdrawal Position)] or it has been determined that the reactor will remain shutdown under all conditions without boron, enter [procedure developed from the RPV Control Guideline] at [Step RC/L].

Primary containment water level and suppression chamber pressure cannot be maintained below the Maximum Primary Containment Water Level Limit, then irrespective of whether adequate core cooling is assured terminate injection into the RPV from sources external to the primary containment until primary containment water level and suppression chamber pressure can be maintained below the Maximum Primary Containment Water Level Limit.

Appendix A. Section: Contingency #5

DEVIATION

- The direction to "terminate injection into the RPV from....." was replaced with "terminate injection into the Primary Containment from.....".

  In accordance with the BWROG EPG ISSUES RESOLUTION FILE 8903.

- "Procedure developed from Contingency # 4" and Procedure developed from RPV Control Guideline" were replaced with "Contingency # 4" and "RPV Control" respectively.

  At NMP2, the procedure developed from Contingency # 4 is called Contingency # 4, and the procedure developed from RPV Control Guideline is called RPV Control.

EOP VARIANCE

- "Primary Containment Water Level Limit" was replaced with "curve"for simplicity.

- Break points on the MPCWLL curve were rounded in the conservative direction to be consistent with control room instrument readability.

- Words concerning control rods and boron were simplified to facilitate procedure use.

Appendix A, Section: Contingency #5

NMP2 PSTG STEP

C5-1 Place the ADS logic inhibit switches in ON.

C5-2 If:

- Reactor power is above 4% *(APRM downscale trip)* or cannot be determined, and
- Suppression pool temperature is above the Boron Injection Initiation Temperature, and
- Either an SRV is open or opens or drywell pressure is above 1.68 psig *(high drywell pressure scram setpoint)*,

Then:

- If any Main Steam Line is open, bypass IAS and low RPV water level MSIV isolation interlocks and restore the IAS supply to the containment, and
- Lower RPV water level, irrespective of any consequent reactor power or RPV water level oscillations, by terminating and preventing all injection into the RPV except from boron injection systems and CRD until either:
  - Reactor power drops below 4% *(APRM downscale trip)*, or
  - RPV water level reaches -14.4 in. *(top of active fuel)*, or
  - All SRVs remain closed and drywell pressure remains below 1.68 psig *(high drywell pressure scram setpoint)*.

Appendix A. Section: Contingency #5

BWROG EPG STEP

C5-1 Prevent automatic initiation of ADS

C5-2 If:

- Reactor power is above [3% (APRM downscale trip)] or cannot be determined, and
- Suppression pool temperature is above [the Boron Injection Initiation Temperature], and
- Either an SRV is open or opens or drywell pressure is above [2.0 psig (high drywell pressure scram setpoint)],

Then:

- If any MSIV is open, bypass low RPV water level pneumatic system and MSIV isolation interlocks and restore the pneumatic supply [to the containment], and
- Lower RPV water level, irrespective of any consequent reactor power or RPV water level oscillations, by terminating and preventing all injection into the RPV except from boron injection systems and CRD until either:
- Reactor power drops below [3% (APRM downscale trip)], or
- RPV water level reaches [-164 in. (top of active fuel)], or
- All SRVs remain closed and drywell pressure remains below [2.0 psig (high drywell pressure scram setpoint)].

DEVIATION

- The words "Prevent automatic initiation of ADS" were replaced with "Place the ADS logic inhibit switches in ON.

  Placing the ADS logic inhibit switches in ON is the NMP2 methodology to prevent automatic initiation of ADS.

- The word "MSIV" was replaced with "Main Steam Line".

  IAS supply does not have to be immediately restored to the containment if only one MSIV on either main steam line is open. The other MSIV which remains closed, maintains that main steam line closed, thus "Main Steam Line" better describes the condition under which action is taken.

- The words "Pneumatic system" were replaced with "IAS".

  At NMP2, IAS is the pneumatic system that applies to this step.

EOP VARIANCE

- This step is combined with the following override step which contains the same elements plus a condition that RPV water level must be above TAF. This affects neither the sequence nor the intent of the EOPs but enhances the flowchart structure and usability.

- The flowchart uses the word "defeat" in reference to RPV water level interlocks. This has no impact on procedure use, however, maintain consistency between the method used to perform this function and the definition of the word "defeat".

Appendix A, Section: Contingency #5

NMP2 PSTG STEP

If while executing the following steps Emergency RPV Depressurization is required, continue in this procedure at Step C5-3.1.

BWROG EPG STEP

If while executing the following steps Emergency RPV Depressurization is required, continue in this procedure at [Step C5-3.1].

DEVIATION

None.

Appendix A. Section: Contingency #5

EOP VARIANCE

This step is combined with the override at the beginning of the procedure to enhance the flowchart's structure and use. The sequence of actions for this format is the same as the EPG's with one exception: The condition where Emergency Depressurization is required at the same time as the condition which require lowering of RPV water level. In the flowchart, Emergency Depressurization would be directed first, following which level will be restored to above of TAF (due to boron injection). In the EPG, level would first be lowered, then Emergency Depressurization would be performed and then, following depressurization, level would be restored to that at which it was initially lowered. For plants which inject SLS directly into the shroud, this sequence is flawed since level recovery (above TAF) is not permitted until the reactor remains shutdown on control rods alone. This is due to the potential of sweeping boron out of the core region when recovery is performed. EPG rev. 4 Appendix B page B-14-60 specifically states "...... plants with SLC injection inside the shroud are no to take action to restore RPV water level until all control rods are inserted to or beyond Maximum Subcritical Banked Withdrawal Position or it can be determined that the reactor will remain shutdown under all conditions without boron". Combining this step with the first procedure override as well as additions to the normal level control leg and Emergency Depressurization leg of the flowchart provides the best possible direction for level control. This is consistent with the EPG basis for these actions. Refer to discussion on steps RC/P-4 and RC/P-5. Also refer to EPG Issues Resolution File Nos. 8907 and 8937.

NMP2 PSTG STEP

If while executing the following step:

- Reactor power is above 4% *(APRM downscale trip)* or cannot be determined, and
- RPV water level is above -14.4 in. *(top of active fuel)*, and
- Suppression pool temperature is above the Boron Injection Initiation Temperature, and
- Either an SRV is open or opens, or drywell pressure is above 1.68 psig*(high drywell pressure scram setpoint)*,

return to Step C5-2.

BWROG EPG STEP

If while executing the following step:

- Reactor power is above [3% (APRM downscale trip)] or cannot be determined, and
- RPV water level is above [-164 in. (top of active fuel)], and
- Suppression pool temperature is above [the Boron Injection Initiation Temperature], and
- Either an SRV is open or opens or drywell pressure is above [2.0 psig (high drywell pressure scram setpoint)], return to [Step C5-2].

DEVIATION

None.

EOP VARIANCE

None.

NMP2 PSTG STEP

C5-3 Maintain RPV water level either: 7

- If RPV water level was deliberately lowered in Step C5-2, between -45.6 in. *(Minimum Steam Cooling RPV Water Level)* and the level to which it was lowered, or
- If RPV water level was not deliberately lowered in Step C5-2, between -14.4 in. *(top of active fuel)* and +202.3 in. *(high level trip setpoint)*, with the following systems:
  - Condensate / feedwater
  - CRD
  - RCIC with suction from the condensate storage tank, if available defeating low RPV pressure isolation interlocks if necessary. 3 4

If RPV water level was not deliberately lowered in Step C5-2 and RPV water level cannot be maintained above -14.4 in. *(top of active fuel)*, maintain RPV water level between -45.6 in. *(Minimum Steam Cooling RPV Water Level)* and +202.3 in. *(high level trip setpoint)*.

If RPV water level cannot be maintained above -45.6 in. *(Minimum Steam Cooling RPV Water Level)*, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

BWROG EPG STEP

C5-3 Maintain RPV water level either: 7

- If RPV water level was deliberately lowered in [Step C5-2], between [-195 in. (Minimum Steam Cooling RPV Water Level)] and the level to which it was lowered, or
- If RPV water level was not deliberately lowered in [Step C5-2], between [-164 in. (top of active fuel)], and [+58 in. (high level trip setpoint)], with the following systems:
- Condensate/feedwater
- CRD
- RCIC with suction from the condensate storage tank, defeating low RPV pressure isolation interlocks and high suppression pool water level suction transfer logic if necessary. 3 4
- [• HPCI with suction from the condensate storage tank, defeating high suppression pool water level suction transfer logic if necessary.]
- [• LPCI with injection through the heat exchangers as soon as possible; control and maintain pump flow less than the RHR Pump NPSH Limit and [the RHR Vortex Limit].]

If RPV water level was not deliberately lowered in [Step C5-2] and RPV water level cannot be maintained above [-164 in. (top of active fuel)], maintain RPV water level between [-195 in. (Minimum Steam Cooling RPV Water Level)] and [+58 in. (high level trip setpoint)].

If RPV water level cannot be maintained above [-195 in. (Minimum Steam Cooling RPV Water Level)], EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

Appendix A. Section: Contingency #5

DEVIATION

- The words "if available were added to the direction concerning RCIC operation.

  This is a partial incorporation of BWROG EPG Issues Resolution File No. 8905.

- The direction to defeat high suppression pool water level suction transfer logic was deleted.

  At NMP2 RCIC does not shift suction on high suppression pool water level.

- "HPCI with suction from the condensate storage tank, defeating high suppression pool water level suction transfer logic if necessary.]" was deleted.

  NMP2 does not have an HPCI system.

- "LPCI with injection through the heat exchangers as soon as possible; control and maintain pump flow less than the RHR Pump NPSH Limit and [the RHR Vortex Limit]" was deleted.

  NMP2 LPCI injects within the core shroud. The intent of this step is to use only systems which inject outside the shroud.

Appendix A, Section: Contingency #5

EOP VARIANCE

- The actions of this step were split into the two parallel paths entitled: "Normal Level" and "Containment Concern, Lowered Level". All step actions were retained.

- The normal level control section specifies alternate level control guidance recognizing where NMP2 injects boron into the RPV.

- Plant specific procedure references were added to facilitate their use.

NMP2 PSTG STEP

C5-3.1 Terminate and prevent all injection into the RPV except from boron injection systems, CRD, and RCIC until RPV pressure is below the Minimum Alternate RPV Flooding Pressure.

NUMBER OF OPEN SRVs	MINIMUM ALTERNATE RPV FLOODING PRESSURE (psig)
7 or more	135
6	160
5	195
4	247
3	334
2	508
1	1031

If no *(minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)* SRV can be opened, continue in this procedure.

BWROG EPG STEP

C5-3.1 Terminate and prevent all injection into the RPV except from boron injection systems, CRD and RCIC until RPV pressure is below the Minimum Alternate RPV Flooding Pressure.

Number of open SRVs	Minimum Alternate RPV Flooding Pressure (psig)
[7 or more	94]
[6	112]
[5	137]
[4	175]
[3	238]
[2	364]
[1	743]

If less than [1 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure)] SRV[s] can be opened, continue in this procedure.

Appendix A. Section: Contingency #5

DEVIATION

The words "less than" were replaced with "no".

"Less than 1 SRV" means the same as "no SRV". No change to the intent of this step.

EOP VARIANCE

- The numbers in the EOP table were rounded to the nearest significant digit. Different plant conditions may result in opposing conservative directions. Therefore the numbers were not rounded to be consistent with control room instrument readability.

- The MARFP table is called a "Figure" to eliminate potential confusion with the numbering system of tables and figures.

NMP2 PSTG STEP

C5-3.2 Commence and slowly raise injection into the RPV with the following systems to restore and maintain RPV water level above -14.4 in. (top of active fuel):

- Condensate / feedwater
- CRD
- RCIC with suction from the condensate storage tank, if available defeating low RPV pressure isolation interlocks if necessary.

If RPV water level cannot be restored and maintained above -14.4 in. (top of active fuel), restore and maintain RPV water level above -45.6 in. (Minimum Steam Cooling RPV Water Level).

If RPV water level cannot be restored and maintained above -45.6 in. (Minimum Steam Cooling RPV Water Level), commence and, irrespective of pump NPSH and vortex limits, slowly raise injection into the RPV with the following systems to restore and maintain RPV water level above -45.6 in. (Minimum Steam Cooling RPV Water Level):

- HPCS
- LPCS
- LPCI with injection through the heat exchangers as soon as possible.
- RHR service water crosstie
- Fire system
- ECCS keep full systems
- Condensate Transfer

BWROG EPG STEP

C5-3.2 Commence and, irrespective of pump NPSH and vortex limits, slowly increase injection into the RPV with the following systems to restore and maintain RPV water level above [-164 in. (top of active fuel)]: 7

- Condensate/feedwater
- CRD
- RCIC with suction from the condensate storage tank, defeating low RPV pressure isolation interlocks and high suppression pool water level suction transfer logic if necessary.
- [• HPCI with suction from the condensate storage tank, defeating high suppression pool water level suction transfer logic if necessary.]
- [• LPCI with injection through the heat exchangers as soon as possible.]

If RPV water level cannot be restored and maintained above [-164 in. (top of active fuel)], restore and maintain RPV water level above [-195 in. (Minimum Steam Cooling RPV Water Level)].

If RPV water level cannot be restored and maintained above [-195 in. (Minimum Steam Cooling RPV Water Level)], commence and, irrespective of pump NPSH and vortex limits, slowly increase injection into the RPV with the following systems to restore and maintain RPV water level above [-195 in. (Minimum Steam Cooling RPV Water Level)]:

- HPCS
- LPCS
- [• RHR service water crosstie]
- [• Fire System]
- [• Interconnections with other units]
- [• ECCS keep-full systems]

Appendix A. Section: Contingency #5

DEVIATION

- LPCI was added to the list of injection systems to restore level above -45.2 in and deleted from the list of systems to restore level above -14.4 in.

  The NMP2 LPCI system injects inside the shroud. This placement is consistent with the intent of EPG rev. 4 Appendix B page B-14-51 and B-14-53. The first section of the step is specifically for systems which inject outside the shroud and the contingent actions of the step provide for all sources.

- The word "increase was replaced with "raise".

  Plant specific terminology.

- The direction to defeat high suppression pool water level suction transfer logic was deleted.

  At NMP2 RCIC does not shift suction on high suppression pool water level.

- The words "irrespective of pump NPSH and vortex limits" were deleted, within the first section of the step. They are retained in the contingent actions.

  At NMP2 NPSH and vortex limits were not established for Condensate/Feedwater, CRD, and RCIC pumps.

- "HPCI with suction from the condensate storage tank, defeating high suppression pool water level suction transfer logic if necessary.]" was deleted.

  NMP2 does not have an HPCI system.

(Continued next page)

DEVIATION (Continued from previous page)

- The words "if available were added to the direction concerning RCIC operation.

  This is a partial incorporation of BWROG EPG Issues Resolution File No. 8905.

- The words "Interconnections with other units"were deleted.

  Except for Fire system which is already listed, NMP2 does not have interconnections with other units.

- Condensate transfer was added to the list of systems available for injection.

  NMP2 can inject condensate transfer into the RPV using plant specific procedures. It is appropriate to add this option of an available system.

EOP VARIANCE

- Minimum Steam Cooling RPV Water Level value was conservatively rounded in the flowchart to be consistent with control room instrument readability.

- Plant specific procedure references were added to facilitate their use.

- Specific guidance is added to the flowchart regarding the upper control level for RPV water level. This is consistent with EPG (rev.4) appendix B discussion of step CS-4 which does not allow RPV level recovery ~~until a~~ (above TAF) until all (or a sufficient number) of control rods are inserted. Additionally providing a level band is required here since the procedures (flowcharts) do not redirect you back to one of the other legs as the EPG does.

Appendix A. Section: Contingency #5

NMP2 PSTG STEP

If RPV water level cannot be restored and maintained above -45.6 in. *(Minimum Steam Cooling RPV Water Level)*, PRIMARY CONTAINMENT FLOODING IS REQUIRED, enter Contingency #6.

BWROG EPG STEP

If RPV water level cannot be restored and maintained above [-195 in. (Minimum Steam Cooling RPV Water Level)], enter [procedure developed from Contingency #6].

Appendix A, Section: Contingency #5

DEVIATION

- The words "PRIMARY CONTAINMENT FLOODING IS REQUIRED" were added.

  In accordance with BWROG EPG Issues Resolution File No. 8931. This addition ensures that suppression pool level control is transferred from SP/L when the primary containment is to be flooded. Also, see EPG Appendix B page B-7-73.

- "Procedure developed from Contingency # 6" was replaced with "Contingency #6"

  At NMP2, the procedure developed from Contingency #6 is called Contingency #6.

EOP VARIANCE

Minimum Steam Cooling RPV Water Level value was conservatively rounded in the flowchart to be consistent with control room instrument readability.

NMP2 PSTG STEP

C5-3.3 When RPV water level can be maintained above -45.6 in. *(Minimum Steam Cooling RPV Water Level)*, return to Step C5-3.

BWROG EPG STEP

C5-3.3 When RPV water level can be maintained above [-195 in. (Minimum Steam Cooling RPV Water Level)], return to [Step C5-3].

DEVIATION

None.

EOP VARIANCE

This step is not retained in the flowchart, rather, each section of the flowchart specifies the band level that should be maintained. This simplifies the logic of the procedure and prevents constructing a continuous "do loop". In addition, RPV level is not restored above TAF to the point at which it was lowered in Step C5-2 due to the boron dilution concern regarding where NMP2 injects boron.

NMP2 PSTG STEP

Not Applicable.

BWROG EPG STEP

> If while executing the following step reactor power commences and continues to increase, return to [Step C5-2].

C5-4 When [364 pounds (Hot Shutdown Boron Weight)] of boron have been injected, restore and maintain RPV water level between [+12 in. (low level scram setpoint)] and [+58 in. (high level trip setpoint)].

If RPV water level cannot be restored and maintained above [+12 in. (low level scram setpoint)], maintain RPV water level above [-164 in. (top of active fuel)].

If RPV water level cannot be maintained above [-164 in. (top of active fuel)], EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; return to [Step C5-3.1].

Appendix A. Section: Contingency #5

DEVIATION

This step including its override were deleted.

NMP2 injects SLS inside the shroud via HPCS sparger. This step is therefore deleted in accordance with EPG rev. 4 Appendix B page B-14-60.

EOP VARIANCE

None.

Appendix A. Section: Contingency #5

NMP2 PSTG STEP

C5-4 When either all control rods are inserted to or beyond position 02 or it has been determined that the reactor will remain shutdown under all conditions without boron, exit this procedure and enter RPV Control at Step RC/L.

BWROG EPG STEP

C5-5 When [procedure for cooldown to cold shutdown conditions] is entered from [procedure developed from the RPV Control Guideline] at [Step RC/P-5], proceed to cold shutdown in accordance with [procedure for cooldown to cold shutdown conditions].

DEVIATION

- The entire step was rewritten.

  The BWROG EPG does not provide direction to recover RPV water level for those plants that inject SLC into the HPCS sparger (ie: SLC injection is inside the shroud). For those plants (including NMP2) it is not appropriate to restore RPV water level until either one of these two conditions exist:

  1. All control rods are inserted to at least position 02, or
  2. It has been determined that the reactor will remain shutdown under all conditions without boron.

  If neither one of these two conditions exists, it is important to remain in C-5 and maintain water at the level to which it was lowered until these two conditions exist. When either one of these conditions exists, RPV Control Section RC/L is entered. Adding these requirements ensures that C5 is not exited prematurely and is consistent with EPG rev. 4 Appendix B page B-14-60.

- Step numbers in the PSTG are not consistent with the EPG.

  This is due to the deletion of EPG step C5-4.

EOP VARIANCE

The words concerning control rods and boron were simplified.

NMP2 PSTG STEP

If while executing the following steps:

- Primary containment water level and suppression chamber pressure cannot be maintained below the Maximum Primary Containment Water Level Limit, then irrespective of whether adequate core cooling is assured terminate injection into the Primary Containment from sources external to the Primary Containment until primary containment water level and suppression chamber pressure can be maintained below the Maximum Primary Containment Water Level Limit.
- RPV water level can be restored and maintained above -14.4 in. *(top of active fuel)*, enter RPV Control at Step RC/L.

BWROG EPG STEP

If while executing the following steps:

- Primary containment water level and suppression chamber pressure cannot be maintained below the Maximum Primary Containment Water Level Limit, then irrespective of whether adequate core cooling is assured terminate injection into the RPV from sources external to the primary containment until primary containment water level and suppression chamber pressure can be maintained below the Maximum Primary Containment Water Level Limit.
- RPV water level can be restored and maintained above [-164 in. (top of active fuel)] enter [procedure developed from the RPV Control Guideline] at [Step RC/L].

Appendix A. Section: Contingency #6

DEVIATION

- The direction to "terminate injection into the RPV from....." was replaced with "terminate injection into the Primary Containment from.....".

  In accordance with the BWROG EPG ISSUES RESOLUTION FILE 8903.

- "Procedure developed from "RPV Control Guideline" was replaced with "RPV Control".

  At NMP2, the procedure developed from "RPV Control Guideline is called RPV Control.

EOP VARIANCE

- The word "curve" replaced "Maximum Primary Containment Water Level Limit" to simplify this step.

- Values for break points on the MPCWLL figure were conservatively rounded to be consistent with control room instrument readability.

NMP2 PSTG STEP

Not applicable.

BWROG EPG STEP

C6-1 Initiate SPMS.

DEVIATION

NMP2 does not have a SPMS.

EOP VARIANCE

None.

NMP2 PSTG STEP

C6-1 Operate the following systems:

- HPCS with suction from the condensate storage tank when available.
- LPCS
- Condensate / feedwater
- CRD
- RCIC with suction from the condensate storage tank only, defeating low RPV pressure isolation interlocks if necessary.
- RHR Service water crosstie
- Fire system
- ECCS keep-full systems
- Condensate transfer
- LPCI, unless RHR Service water crosstie, condensate transfer, or fire system are available

Execute Steps C6-2 and C6-3 concurrently.

BWROG EPG STEP

C6-2 Operate the following systems:

- HPCS with suction from the condensate storage tank when available.
- LPCS; operate one LPCS with suction from the condensate storage tank [or fire system] only when the other LPCS is operating with suction from the suppression pool.
- Condensate/feedwater
- CRD
- RCIC with suction from the condensate storage tank only, defeating low RPV pressure isolation interlocks and high suppression pool water level suction transfer logic if necessary.
- LPCI with suction from sources external to the primary containment [only.] [if possible.]

[• RHR service water crosstie]

[• Fire system]

[• Interconnections with other units]

[• ECCS keep-full systems]

[• Other primary containment fill systems]

Execute [Steps C6-3 and C6-4] concurrently.

Appendix A. Section: Contingency #6

DEVIATION

- In the direction to operate LPCS, the following words were deleted: "operate one LPCS with suction from the condensate storage tank [or fire system] only when the other LPCS is operating with suction from the suppression pool"

  NMP2 has only one LPCS with suction from the suppression pool.

- In the direction to operate LPCI, the words "with suction from sources external to the primary containment [only.] [if possible.]" were replaced with "unless RHR service water crosstie, condensate transfer, or fire system are available".

  At NMP2 LPCI injects inside the shroud, therefore "[if possible]" would apply, however, it is preferable to operate with sources external to the primary containment such as RHR service water crosstie, condensate transfer, or fire system. LPCI should be operated only if these sources are not available, as it provides a measure of core cooling.

- The direction to defeat RCIC high suppression pool water level suction transfer logic was deleted.

  At NMP2 RCIC does not shift suction on high suppression pool water level.

- Step numbers in the PSTG are not consistent with the EPG.

  This is due to the deletion of EPG step C6-1.

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DEVIATION (Continued from previous page)

- The words "Interconnections with other units" were deleted.

  Except for Fire system which is already listed, NMP2 does not have interconnections with other units.

- The words "Other Primary Containment fill systems" were replaced with "Condensate transfer"

  At NMP2 Condensate transfer is an alternate system to inject into the Primary Containment.

EOP VARIANCE

- Plant specific procedure references were added to facilitate their use.

- The phrase "(inject into the RPV, if possible)" was added to point out the preferred injection flowpath for Primary Containment flooding.

NMP2 PSTG STEP

C6-2 When primary containment water level reaches El. 248 ft. 6 in. *(elevation of the bottom of the lowest recirculation piping)*, then irrespective of the offsite radioactivity release rate vent the RPV, defeating isolation interlocks if necessary, until RPV water level reaches -38 in *(Minimum level for Primary Containment Flooding)* using the condenser.

BWROG EPG STEP

C6-3 When primary containment water level reaches [26 ft 3 in. (elevation of the bottom of the lowest recirculation piping)], then irrespective of the offsite radioactivity release rate vent the RPV, defeating isolation interlocks if necessary, until RPV water level reaches [-164 in. (top of active fuel)] with one or more of the following:

- Flood vent valves
- MSIVs
- Main steam line drains
- HPCI steam line
- RCIC steam line
- IC tube side vents
- RHR

DEVIATION

- HPCI and IC tube side vents were deleted from the list of measures to vent the RPV.

  NMP2 does no have HPCI or IC.

- The words "flood vent valves" were deleted.

  NMP2 does not have Flood vent valves.

- The words "MSIVs" and "Main steam line drains" were replaced with "Condenser".

  These components were combined to be consistent with the procedure used to perform the venting operation. The intent of the EPG was not changed (Reference: N2-EOP-6, Attachment 1~~8~~ 2).

- Step numbers in the PSTG are not consistent with the EPG.

  This is due to the deletion of EPG step C6-1.

Continued next page

DEVIATION (Continued from previous page)

- The use of RCIC steam line was deleted.

  NMP2 is not able to operate RCIC when the containment is flooded. Additionally, RCIC steam line drains use the same flow path to the condenser as the main steam line drains. The main steam line drains are maintained in this procedure, therefore, RCIC steam line is not required.

- The use of RHR steam condensing was deleted.

  NMP2 steam condensing returns either to RCIC or to the suppression pool. Under the postulated plant conditions, neither one will vent the RPV effectively.

- "Top of active fuel" was changed to "Minimum level for Primary Containment Flooding".

  Refer to the discussion on step C6-3.

EOP VARIANCE

Plant specific procedure references were added to facilitate their use.

NMP2 PSTG STEP

C6-3 When primary containment water level reaches El. 292.5 ft. (elevation of containment vent minus adjustment for instrument accuracy), continue to fill the Primary Containment injecting into the RPV only, until Primary Containment water level reaches El. 296.5 ft. (RPV level of -38 in.) (minimum level for Primary Containment flooding).

Maintain primary containment water level between El. 296.5 ft. (RPV level of -38 in.) and the Maximum Primary Containment Water Level Limit with the following systems taking suction from sources external to the primary containment only when required, injecting into the RPV:

- HPCS
- LPCS
- Condensate / Feedwater
- CRD
- LPCI
- Head spray
- RHR service water crosstie
- Fire system
- ECCS keep - full systems
- Condensate transfer

BWROG EPG STEP

C6-4 When primary containment water level reaches [83 ft 5 in. (elevation of top of active fuel)], maintain primary containment water level between [83 ft 5 in. (elevation of top of active fuel)] and the Maximum Primary Containment Water Level Limit with the following systems taking suction from sources external to the primary containment only when required:

- HPCS
- LPCS
- Feedwater/condensate
- CRD
- LPCI
- Head spray

[• RHR service water crosstie]

[• Fire system]

[• Interconnections with other units]

[• ECCS keep-full systems]

[• Other primary containment fill systems]

DEVIATION

- Step numbers in the PSTG are not consistent with the EPG.

  This is due to the deletion of EPG step C6-1.

- The words "Interconnections with other units" were deleted.

  Except for Fire system which is already listed, NMP2 does not have interconnections with other units.

- The words "Other Primary Containment fill systems" were replaced with "Condensate transfer"

  At NMP2 Condensate transfer is an alternate system to inject into the Primary Containment.

- "Condensate/Feedwater" replaced "Feedwater/Condensate"

  Plant specific terminology.

Continued next page

DEVIATION (Continued from previous page)

- NMP2 utilizes El. 296.5 ft. rather than the elevation corresponding to the top of active fuel as a minimum RPV water level.

  At NMP2, TAF is approximately three inches above the bottom of the primary containment vent pipe, thus water level cannot be restored above TAF by filling the primary containment to this level without jeopardizing the plant's containment venting capability. Primary containment water level cannot be maintained at an exact constant level. Rather, the operators should be given a band within which they should maintain the water level. Two options exist for this band: The first option is to violate the minimum, ie: set a lower minimum such that water level may be maintained below the existing minimum of El.298 ft. 6 in. (top of active fuel). The second option is to violate the maximum, ie: set a higher maximum such that water level may be maintained above the maximum primary containment water level limit (elevation of the primary containment vent). Without minimizing the importance of maintaining water level above the top of active fuel, it is considered more critical to assure the integrity of the primary containment. This integrity cannot be assured if water level is not always maintained below the primary containment vent, otherwise, the primary containment design pressure may be exceeded. Therefore, a new minimum is to be established in lieu of 298 ft. 6 in. This new minimum should be no lower than the minimum steam cooling RPV water level (MSCRWL) which is calculated to be at El. 296 ft. A factor of safety of 6 inches is added to this minimum as MSCRWL should not be reached. This will establish the resultant band to be between El. 296 ft. 6 in. and El. 298 ft. 3 in. This 1 ft. 9 in. band is achievable considering the water flow rates and the surface area of the primary containment at this elevation. (Reference: Problem Report 9170, Modification Request).

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DEVIATION (Continued from previous page)

- The words "injecting into the RPV only" were added to the action as described in the EPG as well as the RPV water level corresponding to the Maximum Primary Containment Water Level Limit. In addition, NMP2 added an additional step regarding injection into the RPV only.

  At NMP2, Primary Containment water level above El. 224 ft. can be determined by ΔP calculation up to El. 296 ft.. Above El. 296 ft., RPV water level must be used for determination of primary containment water level as long as the RPV is adequately vented. If the RPV cannot be adequately vented, containment water level may actually be higher than the corresponding RPV water level and the containment vent may be jeopardized. The only way to assure that containment water level is lower than RPV's and thus lower than the containment vent, is by injecting to the containment through the RPV. El. 292.5 ft. is used in lieu of 296 ft. to account for the inaccuracies of the instruments at elevations 296 ft. and 224 ft. This will assure that if water level is higher than anticipated (due to instrument error), it will still be below the elevation of the vent, and if the level is lower than anticipated (due to instrument error), it will still be at an RPV water indicated by the Fuel Zone instruments (Reference: Problem Report 9170).

EOP VARIANCE

- Plant specific procedure references were added to facilitate their use.

- This step was modified to reflect the intent to use fuel zone level instruments when containment level is above El. 292.5 ft. This 'implementation item' is due to a potential error with the instruments used when the operators calculate containment water level. If this precaution is not taken, an unconservative error may lead to water covering the containment vent. In addition to this change in the step, a caution is added to further identify the need to use fuel zone instruments.