

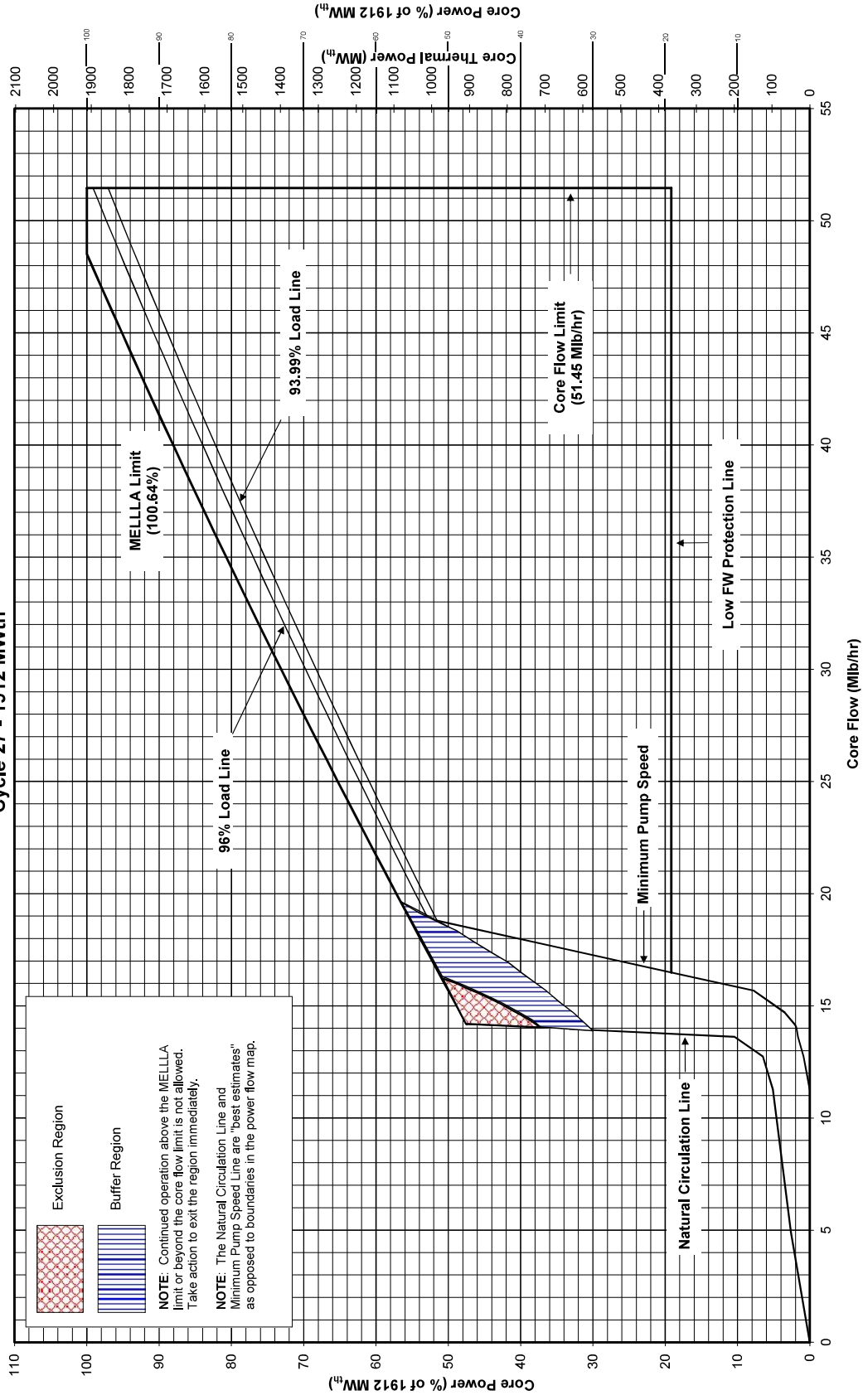
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Reference

Handouts

APPENDIX 1 POWER/FLOW MAP

DAEC Power/Flow Map
Cycle 27 - 1912 MWth



ATTACHMENT 1

CORE FLOW vs CORE PLATE DP

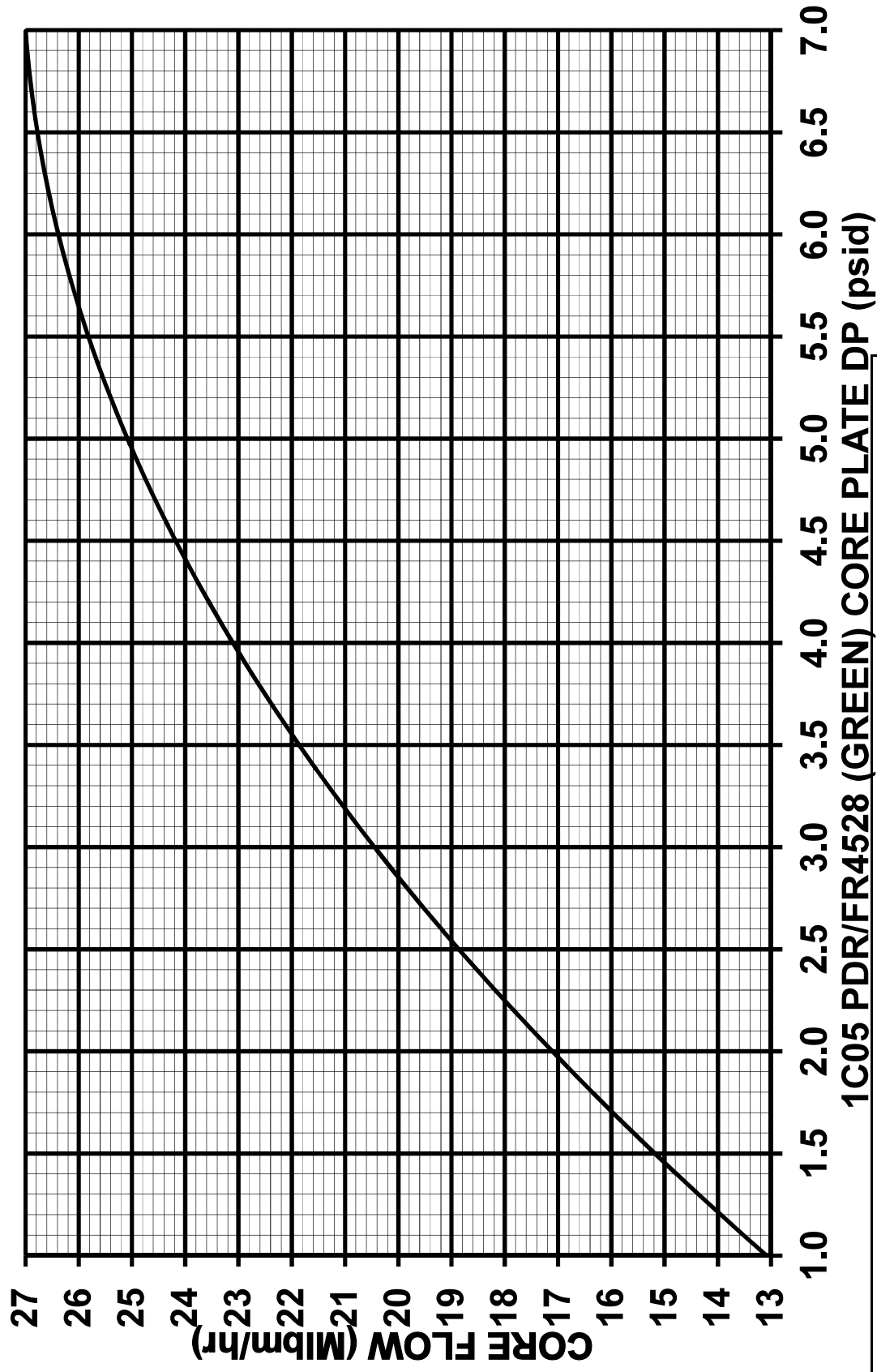
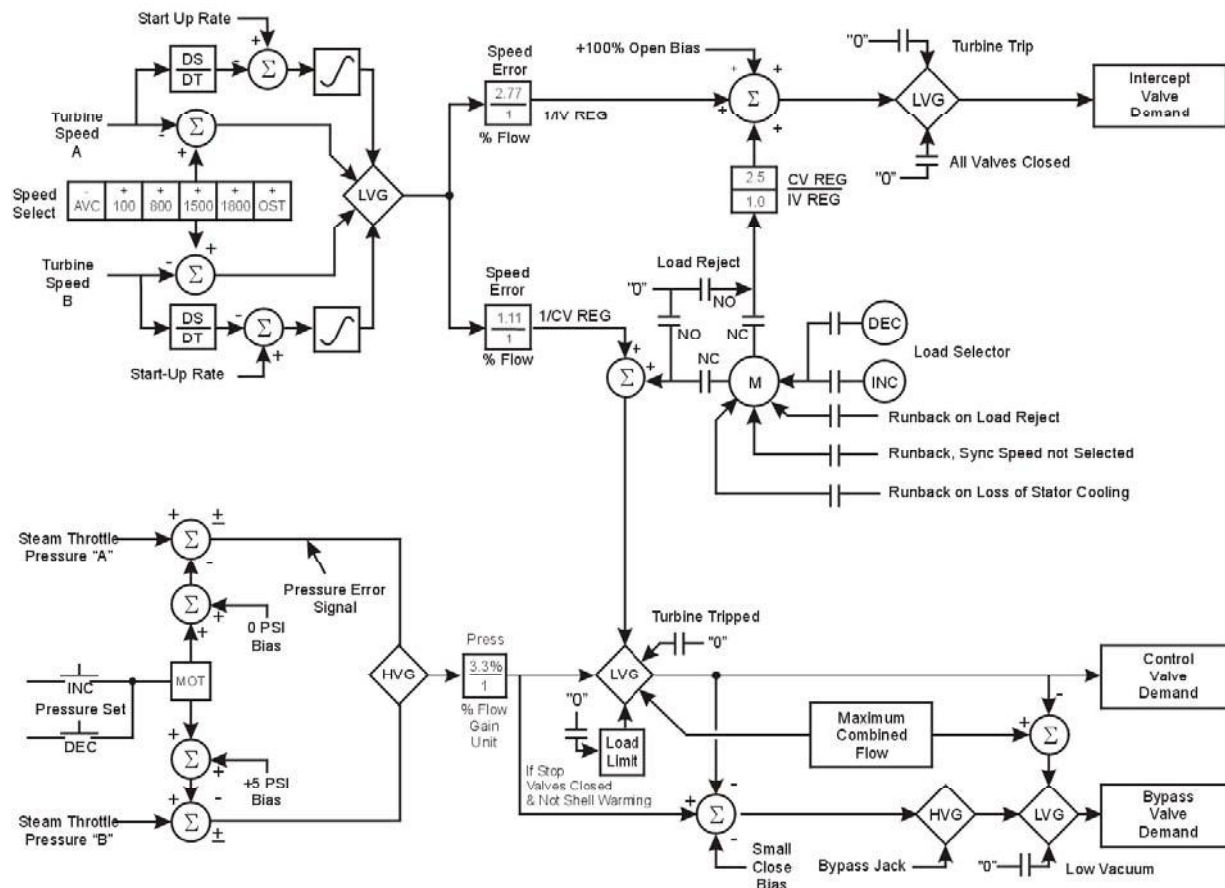


FIGURE #17: EHC LOGIC CONTROL SYSTEM



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Reference

Handouts

3.2 POWER DISTRIBUTION LIMITS

3.2.2 MINIMUM CRITICAL POWER RATIO (MCPR)

LCO 3.2.2 All MCPRs shall be greater than or equal to the MCPR operating limits specified in the COLR.

APPLICABILITY: THERMAL POWER \geq 21.7% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Any MCPR not within limits.	A.1 Restore MCPR(s) to within limits.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to < 21.7% RTP.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.2.1 Verify all MCPRs are greater than or equal to the limits specified in the COLR.	Once within 12 hours after \geq 21.7% RTP <u>AND</u> In accordance with the Surveillance Frequency Control Program

(continued)

3.7 PLANT SYSTEMS

3.7.7 The Main Turbine Bypass System

LCO 3.7.7 The Main Turbine Bypass System shall be OPERABLE.

OR

LCO 3.2.2, “MINIMUM CRITICAL POWER RATIO (MCPR),” limits for an inoperable Main Turbine Bypass System, as specified in the COLR, are made applicable.

APPLICABILITY: THERMAL POWER \geq 21.7% RTP.

ACTIONS

CONDITION		REQUIRED ACTION	COMPLETION TIME
A.	Requirements of the LCO not met.	A.1 Satisfy the requirements of the LCO.	2 hours
B.	Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to < 21.7% RTP.	4 hours

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.10 Reactor Steam Dome Pressure

LCO 3.4.10 The reactor steam dome pressure shall be ≤ 1025 psig.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Reactor steam dome pressure not within limit.	A.1 Restore reactor steam dome pressure to within limit.	15 minutes
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.10.1 Verify reactor steam dome pressure is ≤ 1025 psig.	In accordance with the Surveillance Frequency Control Program

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS), RPV WATER INVENTORY CONTROL, AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.1 ECCS — Operating

LCO 3.5.1 Each ECCS injection/spray subsystem and the Automatic Depressurization System (ADS) function of four safety/relief valves shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3, except High Pressure Coolant Injection (HPCI)
is not required to be OPERABLE with reactor steam dome
pressure ≤ 150 psig and ADS valves are not required to be
OPERABLE with reactor steam dome pressure ≤ 100 psig.

ACTIONS

-----NOTE-----
LCO 3.0.4.b is not applicable to HPCI.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Residual Heat Removal (RHR) pump inoperable.	A.1 Restore RHR pump to OPERABLE status.	30 Days
B. One low pressure ECCS subsystem inoperable for reasons other than Condition A.	B.1 Restore low pressure ECCS subsystem to OPERABLE status.	7 days
C. One Core Spray subsystem inoperable. <u>AND</u> One or two RHR pump(s) inoperable.	C.1 Restore Core Spray subsystem to OPERABLE status. <u>OR</u> C.2 Restore RHR pump(s) to OPERABLE status.	72 hours 72 hours
D. Both Core Spray subsystems inoperable.	D.1 Restore one Core Spray subsystem to OPERABLE status.	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition A, B, C, or D not met.	E.1 Be in MODE 3.	12 hours
	<u>AND</u> E.2 Be in MODE 4.	36 hours
F. HPCI System inoperable.	F.1 Verify by administrative means RCIC System is OPERABLE.	Immediately
	<u>AND</u> F.2 Restore HPCI System to OPERABLE status.	14 days
G. HPCI System inoperable. <u>AND</u> One RHR pump inoperable.	G.1 Restore HPCI System to OPERABLE status.	7 days
	<u>OR</u> G.2 Restore RHR pump to OPERABLE status.	7 days
H. HPCI System inoperable. <u>AND</u> One low pressure ECCS subsystem is inoperable for reasons other than Condition A.	H.1 Restore HPCI System to OPERABLE status.	72 hours
	<u>OR</u> H.2 Restore low pressure ECCS subsystem to OPERABLE status.	72 hours
I. HPCI System inoperable. <u>AND</u> One ADS valve inoperable.	I.1 Restore HPCI System to OPERABLE status.	72 hours
	<u>OR</u> I.2 Restore ADS valve to OPERABLE status.	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
J. Required Action and associated Completion Time of Condition F, G, H, or I not met.	J.1 Be in MODE 3. <u>AND</u> J.2 Reduce reactor steam dome pressure to ≤ 150 psig.	12 hours 36 hours
K. One ADS valve inoperable.	K.1 Restore ADS valve to OPERABLE status.	30 days
L. One ADS valve inoperable. <u>AND</u> One low pressure ECCS subsystem inoperable for reasons other than Condition A.	L.1 Restore ADS valve to OPERABLE status. <u>OR</u> L.2 Restore low pressure ECCS subsystem to OPERABLE status.	72 hours 72 hours
M. Two or more ADS valves inoperable. <u>OR</u> Required Action and associated Completion Time of Condition K or L not met.	M.1 Be in MODE 3. <u>AND</u> M.2 Reduce reactor steam dome pressure to ≤ 100 psig.	12 hours 36 hours

(continued)

ACTIONS (continued)

CONDITION		REQUIRED ACTION	COMPLETION TIME
N.	Two or more low pressure ECCS subsystems inoperable for reasons other than Condition C or D.	N.1 Enter LCO 3.0.3.	Immediately
	<u>OR</u>		
	HPCI System and two or more ADS valves inoperable.		
	<u>OR</u>		
	HPCI System and two or more low pressure ECCS subsystems inoperable.		
	<u>OR</u>		
	One ADS valve and two or more low pressure ECCS subsystems inoperable.		
	<u>OR</u>		
	One ADS valve and HPCI System and one low pressure ECCS subsystem inoperable.		

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify, for each ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program

(continued)

T 3.5 DRYWELL SPRAY SYSTEM AND ES COMPARTMENT COOLING AND VENTILATION

T 3.5.1 Drywell Spray System

TLCO 3.5.1 Two Residual Heat Removal (RHR) drywell spray subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RHR drywell spray subsystem inoperable.	A.1 Restore RHR drywell spray subsystem to OPERABLE status.	30 days
B. Both RHR drywell spray subsystems inoperable.	B.1 Restore at least one RHR drywell spray subsystem to OPERABLE status.	8 hours
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Initiate a Corrective Action Program (CAP) document to determine cause(s) and corrective action(s).	Immediately
	<u>AND</u> C.2 Obtain Plant Manager or designee approval for plans to restore RHR drywell spray subsystem(s) to OPERABLE status.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
TSR 3.5.1.1	Verify the drywell spray spargers are unobstructed by performing an air test on the drywell spray headers and nozzles.	60 months

3.7 PLANT SYSTEMS

3.7.3 Emergency Service Water (ESW) System

LCO 3.7.3 Two ESW subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One ESW subsystem inoperable.</p>	<p>-----NOTES-----</p> <p>1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources-Operating," for diesel generator made inoperable by ESW System.</p> <p>2. Enter applicable Conditions and Required Actions of LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System-Hot Shutdown," for RHR shutdown cooling made inoperable by ESW System.</p> <p>-----</p> <p>A.1 Restore the ESW subsystem to OPERABLE status.</p>	<p>7 days</p>
<p>B. Required Action and Associated Completion Time of Condition A not met.</p> <p><u>OR</u></p> <p>Both ESW subsystems inoperable.</p>	<p>B.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>B.2 Be in MODE 4.</p>	<p>12 hours</p> <p>36 hours</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	<p>-----NOTE-----</p> <p>Isolation of flow to individual components does not render ESW System inoperable.</p> <p>-----</p> <p>Verify each ESW subsystem power operated and automatic valve in the flow paths servicing safety related systems or components, that is not locked, sealed, or otherwise secured in position, is in the correct position.</p>	In accordance with the Surveillance Frequency Control Program
SR 3.7.3.2	Verify each ESW subsystem actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.7 The Main Turbine Bypass System

LCO 3.7.7 The Main Turbine Bypass System shall be OPERABLE.

OR

LCO 3.2.2, “MINIMUM CRITICAL POWER RATIO (MCPR),” limits for an inoperable Main Turbine Bypass System, as specified in the COLR, are made applicable.

APPLICABILITY: THERMAL POWER \geq 21.7% RTP.

ACTIONS

CONDITION		REQUIRED ACTION	COMPLETION TIME
A.	Requirements of the LCO not met.	A.1 Satisfy the requirements of the LCO.	2 hours
B.	Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to < 21.7% RTP.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	Verify one complete cycle of each main turbine bypass valve.	In accordance with the Surveillance Frequency Control Program
SR 3.7.7.2	Perform a system functional test.	In accordance with the Surveillance Frequency Control Program
SR 3.7.7.3	Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits.	In accordance with the Surveillance Frequency Control Program

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources — Operating

LCO 3.8.1 The following AC electrical power sources shall be OPERABLE:

- a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System; and
- b. Two diesel generators (DGs).

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

-----NOTE-----
LCO 3.0.4.b is not applicable to DGs.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One offsite circuit inoperable.	A.1 Perform SR 3.8.1.1 for OPERABLE offsite circuit.	1 hour
	<u>AND</u> A.2 Restore offsite circuit to OPERABLE status.	<u>AND</u> Once per 24 hours thereafter Prior to entering MODE 2 from MODE 3 or 4

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One DG inoperable.	B.1 Perform SR 3.8.1.1 for OPERABLE offsite circuit(s).	1 hour
	<u>AND</u>	<u>AND</u>
	B.2 Declare required feature(s), supported by the inoperable DG, inoperable when the redundant required feature(s) are inoperable.	Once per 12 hours thereafter
	<u>AND</u>	4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	<p>B.3 Determine OPERABLE DG is not inoperable due to common cause failure.</p> <p><u>AND</u></p> <p>-----NOTE----- Not required to be performed when the cause of the inoperable DG is pre-planned, preventive maintenance and testing. -----</p>	24 hours
	<p>B.4 Perform SR 3.8.1.2 for OPERABLE DG.</p> <p><u>AND</u></p>	Once per 72 hours
	<p>B.5 Restore DG to OPERABLE status.</p>	<p>7 days</p> <p><u>AND</u></p> <p>8 days from discovery of failure to meet LCO expect for Condition A</p>
C. Two offsite circuits inoperable.	C.1 Declare required feature(s) inoperable when the redundant required feature(s) are inoperable.	12 hours from discovery of Condition C concurrent with inoperability of redundant required feature(s)

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	<p><u>AND</u></p> <p>C.2 Restore one offsite circuit to OPERABLE status.</p>	<p>24 hours</p> <p><u>AND</u></p> <p>8 days from discovery of failure to meet LCO except for Condition A</p>
D. Two DGs inoperable.	D.1 Restore one DG to OPERABLE status.	2 hours
E. Required Action and Associated Completion Time of Condition A, B, C, or D not met.	<p>E.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>E.2 Be in MODE 4.</p>	<p>12 hours</p> <p>36 hours</p>
F. Three or more AC sources inoperable.	F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each offsite circuit.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.2	<p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 2. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met. 3. When a DG is placed in an inoperable status solely for the performance of testing required by Required Actions B.3 or B.4, entry into associated Conditions and Required Actions may be delayed for up to 2 hours. <p>-----</p> <p>Verify each DG starts from standby conditions and achieves steady state voltage $\geq 3744\text{v}$ and $\leq 4576\text{v}$ and frequency $\geq 59.5\text{Hz}$ and $\leq 60.5\text{Hz}$.</p>	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.3	<p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow, without shutdown, a successful performance of SR 3.8.1.2 or SR 3.8.1.7. <p>-----</p> <p>Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load $\geq 2750\text{kw}$ and $\leq 2950\text{kw}$.</p>	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.4	Verify each tank contains ≥ 220 gal of fuel oil.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.5	Check for the presence of water in the fuel oil in each day tank and remove water as necessary.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.6	Verify the fuel oil transfer system operates to transfer fuel oil from storage tank to the day tank.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.7	<p>-----NOTE----- All DG starts may be preceded by an engine prelube period. -----</p> <p>Verify each DG starts from standby condition and achieves:</p> <p>a. in ≤ 10 seconds, voltage $\geq 3744\text{V}$ and frequency $\geq 59.5\text{Hz}$; and</p> <p>b. steady state, voltage $\geq 3744\text{V}$ and $\leq 4576\text{V}$ and frequency $\geq 59.5\text{Hz}$ and $\leq 60.5\text{Hz}$.</p>	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.8	<p>-----NOTE----- The Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. -----</p> <p>Verify automatic slow transfer of AC power supply from the Startup Transformer to the Standby Transformer.</p>	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.9</p> <p>-----NOTE----- This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. -----</p> <p>Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and:</p> <ul style="list-style-type: none"> a. Following load rejection, the frequency is $\leq 64.5\text{Hz}$. b. Within 1.3 seconds following load rejection, the voltage is $\geq 3744\text{V}$ and $\leq 4576\text{V}$. c. Within 3.9 seconds following load rejection, the frequency is $\geq 59.5\text{Hz}$ and $\leq 60.5\text{Hz}$. 	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.1.10</p> <p>-----NOTE----- This Surveillance shall not be performed in MODE 1, 2 or 3. However, credit may be taken for unplanned events that satisfy this SR. -----</p> <p>Verify each DG's automatic trips are bypassed on an actual or simulated Loss of Offsite Power (LOOP) signal or on an actual or simulated ECCS initiation signal except:</p> <ul style="list-style-type: none"> a. Engine overspeed; and b. Generator lockout. 	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.11</p> <p>-----NOTE----- This Surveillance shall not be performed in MODE 1, 2 or 3. However, credit may be taken for unplanned events that satisfy this SR. -----</p> <p>Verify under manual control each DG:</p> <ul style="list-style-type: none"> a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power; b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation. 	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.1.12</p> <p>-----NOTE----- This Surveillance shall not be performed in MODE 1, 2 or 3. However, credit may be taken for unplanned events that satisfy this SR. -----</p> <p>Verify interval between each sequenced load block is ≥ 2 seconds.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.13 -----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR. <p>-----</p> <p>Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal:</p> <ol style="list-style-type: none"> a. De-energization of essential buses; b. Load shedding from essential buses; and c. DG auto-start from standby condition and: <ol style="list-style-type: none"> 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads in the proper timed sequence, 3. achieves steady state voltage $\geq 3744\text{V}$ and $\leq 4576\text{V}$, 4. achieves steady state frequency $\geq 59.5\text{Hz}$ and $\leq 60.5\text{Hz}$, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes. 	<p>In accordance with the Surveillance Frequency Control Program</p>

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources — Operating

LCO 3.8.4 Both Division 1 and Division 2 125 VDC electrical power subsystems and the 250 VDC electrical power subsystem shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION		REQUIRED ACTION		COMPLETION TIME
A.	One 125 VDC electrical power subsystem inoperable.	A.1	Restore 125 VDC electrical power subsystem to OPERABLE status.	8 hours
<u>OR</u>	<u>NOTE:</u> May be used on a one-time-only basis for each battery division.	A.2.1	Declare required feature(s), supported by the inoperable 125 VDC source, inoperable when the redundant required feature(s) are inoperable. <u>AND</u>	4 hours from discovery of Condition A concurrent with inoperability of redundant required feature(s).
		A.2.2	Restore 125 VDC electrical power subsystem to OPERABLE status.	10 days
B.	Required Action and Associated Completion Time of Condition A not met.	B.1	Be in MODE 3.	12 hours
		<u>AND</u>		
		B.2.	Be in MODE 4.	36 hours
C.	250 VDC electrical power subsystem inoperable.	C.1	Declare associated supported features inoperable.	Immediately
D.	Two or more DC electrical power subsystems inoperable.	D.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is ≥ 130.5 V on float charge for the 125 VDC battery and ≥ 252 V for the 250 VDC battery.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.2	Verify no visible corrosion at battery terminals and connectors. <u>OR</u> Verify battery connection resistance within limits.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.3	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.4	Remove visible corrosion and verify battery cell to cell and terminal connections are coated with anti-corrosion material.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.5	Verify battery connection resistance within limits.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>-----NOTE----- This Surveillance shall not be performed on the required battery chargers in MODE 1, 2 or 3. However, credit may be taken for unplanned events that satisfy this SR.</p> <p>SR 3.8.4.6 Verify each required battery charger supplies ≥ 293 amps at ≥ 132.5 V for the 125 VDC subsystem and ≥ 200 amps at ≥ 258 V for the 250 VDC subsystem.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.4.7 -----NOTES-----</p> <ol style="list-style-type: none"> 1. The modified performance discharge test in SR 3.8.4.8 may be performed in lieu of the service test in SR 3.8.4.7. 2. This Surveillance shall not be performed in MODE 1, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR. <p>-----</p> <p>Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.4.8</p> <p>-----NOTE----- This Surveillance shall not be performed in MODE 1, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR. -----</p> <p>Verify battery capacity is $\geq 80\%$ of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.</p>	<p>In accordance with the Surveillance Frequency Control Program</p> <p><u>AND</u></p> <p>12 months when battery shows degradation or has reached 85% of expected life with capacity < 100% of manufacturer's rating</p> <p><u>AND</u></p> <p>24 months when battery has reached 85% of the expected life with capacity $\geq 100\%$ of manufacturer's rating</p>

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Distribution Systems — Operating

- LCO 3.8.7 The following AC and DC electrical power distribution subsystems shall be OPERABLE:
- a. Division 1 and Division 2 AC electrical power distribution subsystems;
 - b. Division 1 and Division 2 125 VDC electrical power distribution subsystems;
 - c. 250 VDC electrical power distribution subsystem;
 - d. Intake structure electrical power distribution subsystems; and
 - e. 125 VDC RCIC Motor Control Center (MCC).

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION		REQUIRED ACTION	COMPLETION TIME
A.	One or more AC electrical power distribution subsystems inoperable, except for the intake structure electrical power distribution subsystems.	A.1 Restore AC electrical power distribution subsystems to OPERABLE status.	8 hours <u>AND</u> 16 hours from discovery of failure to meet LCO 3.8.7.a or b
B.	One or more essential 125 VDC electrical power distribution subsystems inoperable except for the RCIC MCC.	B.1 Restore the 125 VDC electrical power distribution subsystems to OPERABLE status.	8 hours <u>AND</u> 16 hours from discovery of failure to meet LCO 3.8.7.a or b

(continued)

ACTIONS (continued)

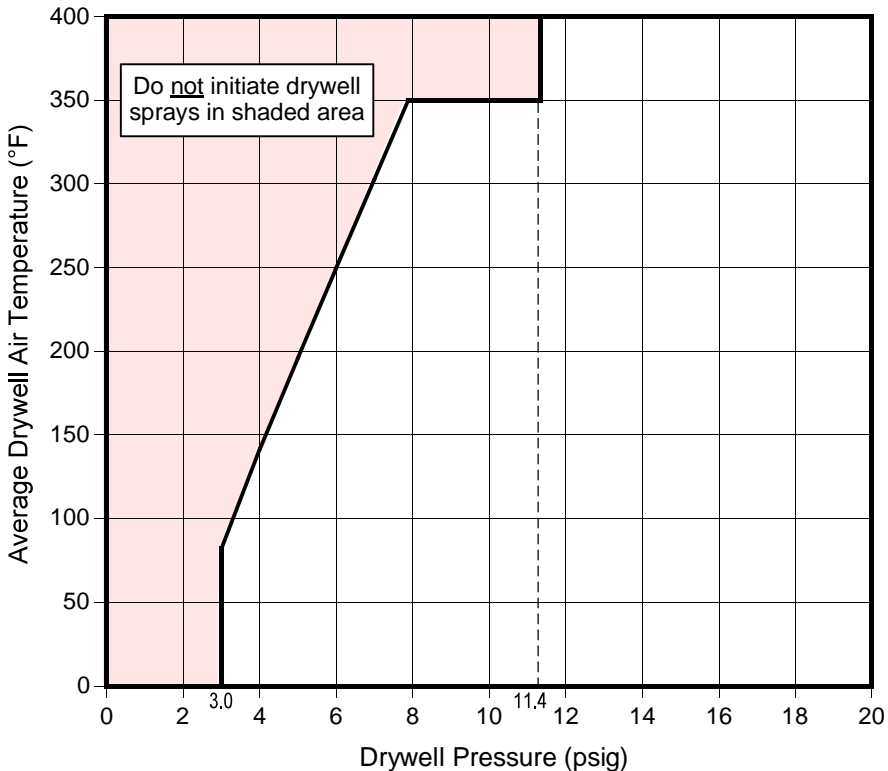
CONDITION		REQUIRED ACTION	COMPLETION TIME
C.	Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3.	12 hours
		<u>AND</u> C.2 Be in MODE 4.	36 hours
D.	One or both intake structure electrical power distribution subsystem(s) inoperable.	D.1 Declare the associated River Water Supply subsystem(s) inoperable.	Immediately
E.	250 VDC electrical power distribution subsystem inoperable.	E.1 Declare associated supported features inoperable.	Immediately
F.	125 VDC RCIC MCC inoperable.	F.1 Declare associated supported features inoperable.	Immediately
G.	Two or more electrical power distribution subsystems inoperable that result in a loss of function, for reasons other than Condition D.	G.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify correct breaker alignments and indicated power availability to required AC and DC electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program
SR 3.8.7.2	Verify proper coordination of the LPCI Swing Bus circuit breakers.	In accordance with the Surveillance Frequency Control Program

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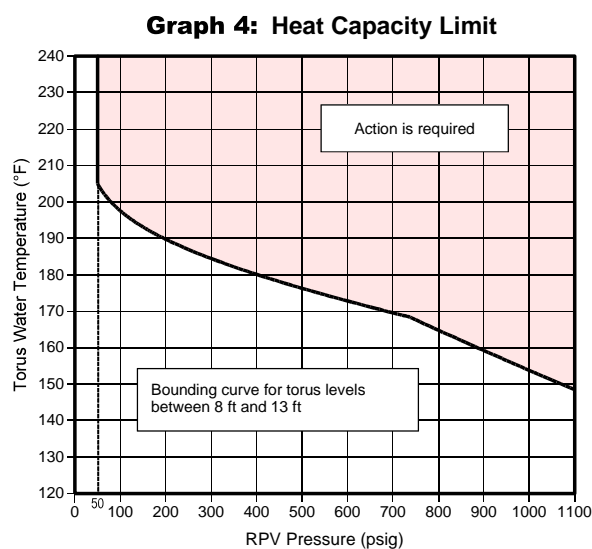
Graph 7: Drywell Spray Initiation Limit



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DISCUSSION - 2nd CRS

The Heat Capacity Limit (See Graph 4) is defined to be the highest torus temperature at which initiation of RPV depressurization will not result in exceeding the Primary Containment Pressure Limit (the PCPL is 53 psig at the DAEC) before the rate of energy transfer from the RPV to the primary containment is within the capacity of the containment vent. Refer to the Curves & Limits EOP Bases Document for a detailed discussion of the Heat Capacity Limit.



Control of torus temperature relative to the Heat Capacity Limit is directed in the Primary Containment Control Guideline, EOP 2. If the actions being taken in EOP 2 to preserve torus heat capacity are inadequate or not effective, RPV pressure may be reduced to provide additional margin to the Heat Capacity Limit. Full depressurization, however, may result in loss of steam-driven injection systems. RPV depressurization to mitigate primary containment challenges must therefore be coordinated with core cooling strategies. Full depressurization is appropriate only if adequate core cooling will not be sacrificed as a result. Loss of adequate core cooling would compound containment challenges and increase any resulting radioactivity release. Core cooling is thus prioritized over other EOP objectives. If, at any time during RPV depressurization, it is anticipated that continued pressure reduction will result in loss of injection flow required for adequate core cooling, the depressurization should be terminated. Pressure should be reduced as low as possible to minimize containment challenges but maintained above the maximum value at which the required injection flow can be sustained.

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EOP 3 - SECONDARY CONTAINMENT CONTROL GUIDELINE

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Table 6		Secondary Containment Limits			
Parameter and Areas		Max Normal Operating Limit	Max Safe Operating Limit	Value/Trend	
Temperature	Area/Location	Indicator	°F	°F	
	A RHR-SE Corner Room Area				
	RHR SE CORNER ROOM AMBIENT	TR/TDR 2000A Ch 1	130	140	
	RHR SE CORNER ROOM DIFFERENTIAL	TR/TDR 2000A Ch 2	50	N/A	
	B RHR-NW Corner Room Area				
	RHR NW CORNER ROOM AMBIENT	TR/TDR 2000B Ch 1	130	140	
	RHR NW CORNER ROOM DIFFERENTIAL	TR/TDR 2000B Ch 2	50	N/A	
	HPCI Room Area				
	HPCI EMER COOLER AMBIENT	TR/TDR 2225A[B] Ch 1	175	310	
	HPCI ROOM AMBIENT	TR/TDR 2225A Ch 2	175	310	
	HPCI ROOM DIFFERENTIAL	TR/TDR 2225A[B] Ch 4[3]	50	N/A	
	RCIC Room Area				
	RCIC EMER COOLER AMBIENT	TR/TDR 2425A[B] Ch 1	175	300	
	RCIC ROOM AMBIENT	TR/TDR 2425A Ch 2	175	300	
	RCIC ROOM DIFFERENTIAL	TR/TDR 2425A[B] Ch 4	50	N/A	
	Torus Area				
	TORUS CATWALK NORTH AMBIENT	TR/TDR 2425A Ch 3	150	165	
	TORUS CATWALK WEST AMBIENT	TR/TDR 2425B Ch 2	150	165	
	TORUS CATWALK SOUTH AMBIENT	TR/TDR 2225A Ch 3	150	165	
	TORUS CATWALK EAST AMBIENT	TR/TDR 2225B Ch 2	150	165	
	TORUS CATWALK EAST DIFF	TR/TDR 2425A Ch 5	50	N/A	
	TORUS CATWALK WEST DIFF	TR/TDR 2425B Ch 5	50	N/A	
	TORUS CATWALK SOUTHWEST DIFF	TR/TDR 2225A Ch 5	50	N/A	
	TORUS CATWALK SOUTH DIFF	TR/TDR 2225B Ch 4	50	N/A	
Radiation	RB 786' South Area				
	RWCU PUMP ROOM AMBIENT	TR/TDR 2700A[B] Ch 1	130	212	
	RWCU HX ROOM AMBIENT	TR/TDR 2700A[B] Ch 2,3	130	212	
	RB 757' South Area				
	RWCU ABOVE TIP ROOM AMBIENT	TR/TDR 2700A[B] Ch 4,5	111.5	150	
	Steam Tunnel Area				
	STEAM TUNNEL AMBIENT	TR/TDR 2425B Ch 3	160	300	
	STEAM TUNNEL DIFFERENTIAL	TR/TDR 2225B Ch 5	70	N/A	
	RB 757' South Area				
	RB RAILROAD ACCESS AREA	RI 9167	10	100	
	SOUTH CRD MODULE AREA	RI 9169	10	100	
	TIP ROOM	RI 9176	60	600	
	RB 757' North Area				
	NORTH CRD MODULE	RI 9168	10	100	
	CRD REPAIR ROOM	RI 9170	15	150	
Water Level	RB 786' North Area				
	RWCU SPENT RESIN ROOM	RI 9173	100	10 ³	
	RWCU PHASE SEP TANK	RI 9177	20	200	
	RB 786' South Area				
	RWCU PUMP ROOM	RI 9156	10 ³	10 ⁴	
	RWCU HX ROOM	RI 9157	10 ³	10 ⁴	
	RB 812' North Area				
	MAIN PLANT EXHAUST FAN ROOM	RI 9171	60	600	
	JUNGLE ROOM	RI 9155	60	600	
	Refuel Floor Area				
	NEW FUEL VAULT AREA	RI 9153	10	100	
	NORTH REFUEL FLOOR	RI 9163	10	100	
	SOUTH REFUEL FLOOR	RI 9164	10	100	
	SPENT FUEL POOL AREA	RI 9178	100	10 ³	
Water Level	Area/Location	Indicator	inches	inches	
	HPCI ROOM	LI 3768	2	6	
	RCIC ROOM	LI 3769	3	6	
	"A" RHR & CS SECR	LI 3770	2	10	
	"B" RHR & CS NWCR	LI 3771	2	10	
	TORUS AREA	LI 3772	2	12	

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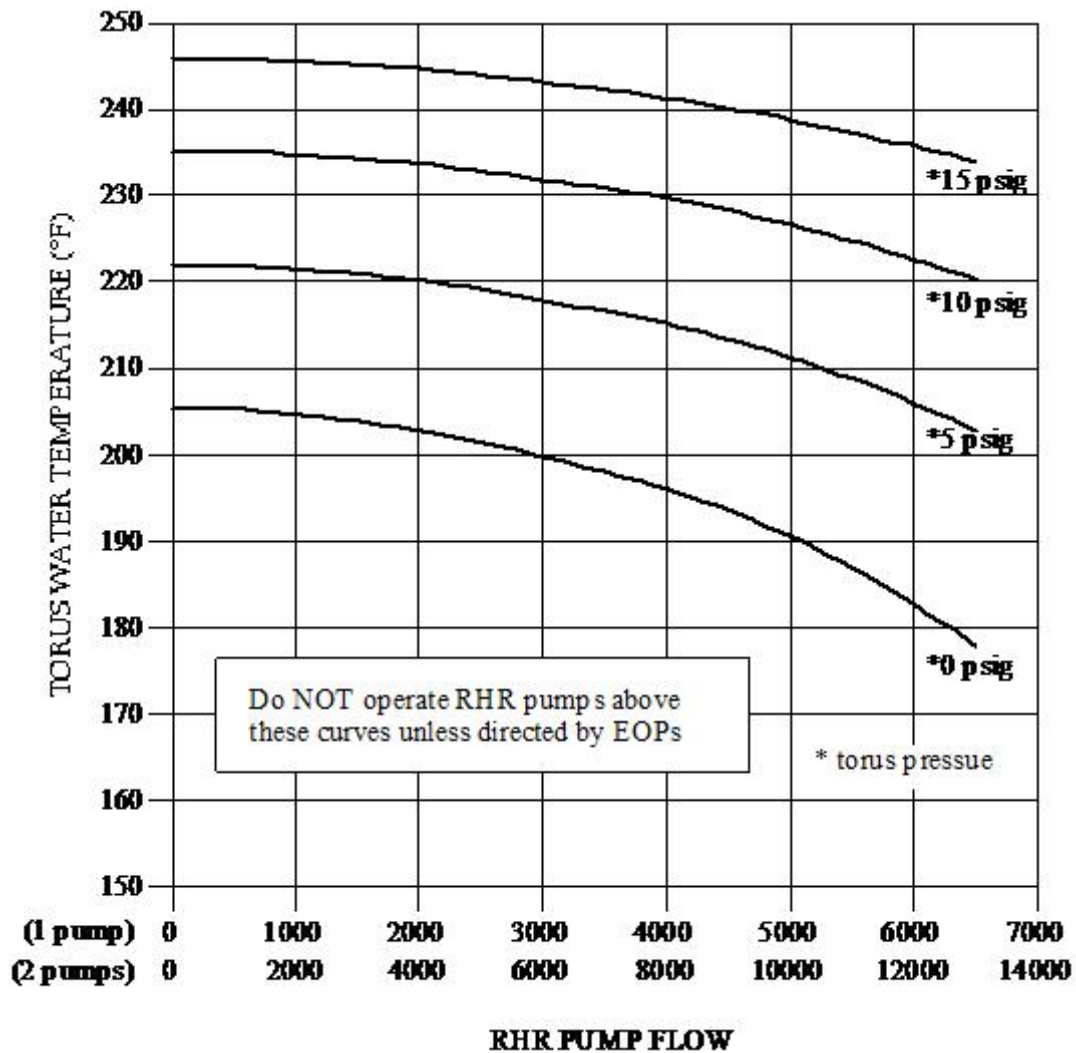


Figure 19: RHR NPSH Limit

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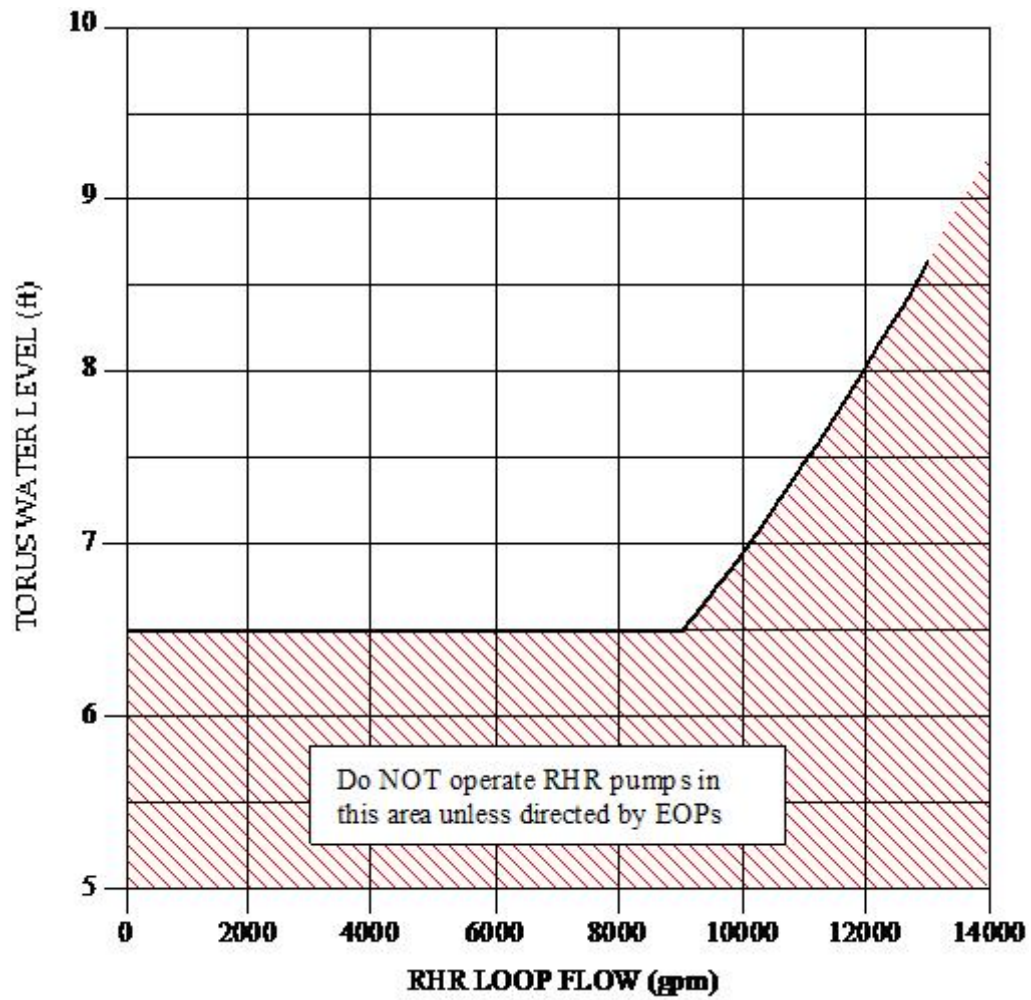


Figure 23: RHR Vortex Limit

GENERAL EMERGENCY		SITE AREA EMERGENCY		ALERT		UNUSUAL EVENT																																																																																																																																							
Abnormal Rad Release	Offsite Rad Conditions	<p>RG1 Offsite Dose Resulting from an Actual or IMMINENT Release of Gaseous Radioactivity GREATER THAN 1000 millirem TEDE or 5000 millirem Thyroid CDE for the Actual or Projected Duration of the Release</p> <p>Note: The Emergency Director (OSM, EC or ER&RD) should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results.</p> <p><input type="checkbox"/> RG1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Dose assessment using actual meteorology indicates doses GREATER THAN 1000 millirem TEDE or 5000 millirem thyroid CDE at or beyond the site boundary. (Preferred method)</p> <p><input type="checkbox"/> RG1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>If Dose Assessment is unavailable, either of the following:</p> <ul style="list-style-type: none">• VALID Reactor Building ventilation rad monitor (Kaman 3/4, 5/6, 7/8) or Turbine Building ventilation rad monitor (Kaman 1/2) reading GREATER THAN 6.0 E-1 µCi/cc and is expected to continue for 15 minutes or longer.• VALID Offgas Stack rad monitor (Kaman 9/10) reading GREATER THAN 4.0 E+2 µCi/cc and is expected to continue for 15 minutes or longer <p><input type="checkbox"/> RG1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Field survey results indicate closed window dose rates GREATER THAN 1000 millirem/hr and is expected to continue for 60 minutes or longer at or beyond the site boundary</p> <p><input type="checkbox"/> RG1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Analyses of field survey samples indicate thyroid CDE GREATER THAN 5000 millirem for one hour of inhalation at or beyond the site boundary</p>		1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	<p>RS1 Offsite Dose Resulting from an Actual or IMMINENT Release of Gaseous Radioactivity GREATER THAN 100 millirem TEDE or 500 millirem CDE Thyroid for the Actual or Projected Duration of the Release</p> <p>Note: The Emergency Director (OSM, EC or ER&RD) should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results.</p> <p><input type="checkbox"/> RS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Dose assessment using actual meteorology indicates doses GREATER THAN 100 millirem TEDE or 500 millirem thyroid CDE at or beyond the site boundary. (Preferred method)</p> <p><input type="checkbox"/> RS1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>If Dose Assessment is unavailable, either of the following:</p> <ul style="list-style-type: none">• Valid Reactor Building ventilation rad monitor (Kaman 3/4, 5/6, 7/8) or Turbine Building ventilation rad monitor (Kaman 1/2) reading GREATER THAN 6.0 E-2 µCi/cc and is expected to continue for 15 minutes or longer.• Valid Offgas Stack rad monitor (Kaman 9/10) reading GREATER THAN 4.0 E+1 µCi/cc and is expected to continue for 15 minutes or longer <p><input type="checkbox"/> RS1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Field survey results indicate closed window dose rates GREATER THAN 100 millirem/hr and is expected to continue for 60 minutes or longer at or beyond the site boundary</p> <p><input type="checkbox"/> RS1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Analyses of field survey samples indicate thyroid CDE GREATER THAN 800 millirem for one hour of inhalation at or beyond the site boundary</p>		1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	<p>RA1 Any Release of Gaseous or Liquid Radioactivity to the Environment GREATER THAN 200 Times the Offsite Dose Assessment Manual (ODAM) Limit and is Expected to Continue for 15 Minutes or Longer</p> <p>Note: The Emergency Director (OSM, EC or ER&RD) should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.</p> <p><input type="checkbox"/> RA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>VALID Reactor Building ventilation rad monitor (Kaman 3/4, 5/6, 7/8) or Turbine Building ventilation rad monitor (Kaman 1/2) reading GREATER THAN 3.0 E-2 µCi/cc and is expected to continue for 15 minutes or longer</p> <p><input type="checkbox"/> RA1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>VALID Offgas Stack rad monitor (Kaman 9/10) reading GREATER THAN 6.0 E+0 µCi/cc and is expected to continue for 15 minutes or longer</p> <p><input type="checkbox"/> RA1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>VALID LLRPSF rad monitor (Kaman 12) reading GREATER THAN 1.0 E-1 µCi/cc and is expected to continue for 15 minutes or longer</p> <p><input type="checkbox"/> RA1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>VALID GSW rad monitor (RIS-4767) reading GREATER THAN 300,000 (3.0 X 10⁵) CPS and is expected to continue for 15 minutes or longer</p> <p><input type="checkbox"/> RA1.5 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>VALID RHRSW & ESW rad monitor (RM-1997) reading GREATER THAN 80,000 (8.0 X 10⁴) CPS and is expected to continue for 15 minutes or longer</p> <p><input type="checkbox"/> RA1.6 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>VALID Rupture Disc rad monitor (RM-4268) reading GREATER THAN 100,000 (1.0 X 10⁵) CPS and is expected to continue for 15 minutes or longer</p> <p><input type="checkbox"/> RA1.7 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates GREATER THAN 200 times ODA limit and is expected to continue for 15 minutes or longer</p>		1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	<p>RU1 Any Release of Gaseous or Liquid Radioactivity to the Environment GREATER THAN 2 Times the Offsite Dose Assessment Manual (ODAM) Limit and is Expected to Continue For 60 Minutes or Longer</p> <p>Note: The Emergency Director (OSM, EC or ER&RD) should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.</p> <p><input type="checkbox"/> RU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>VALID Reactor Building ventilation rad monitor (Kaman 3/4, 5/6, 7/8) or Turbine Building ventilation rad monitor (Kaman 1/2) reading GREATER THAN 1.0 E-3 µCi/cc and is expected to continue for 60 minutes or longer</p> <p><input type="checkbox"/> RU1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>VALID Offgas Stack rad monitor (Kaman 9/10) reading GREATER THAN 2.0 E-1 µCi/cc and is expected to continue for 60 minutes or longer</p> <p><input type="checkbox"/> RU1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>VALID LLRPSF rad monitor (Kaman 12) reading GREATER THAN 1.0 E-3 µCi/cc and is expected to continue for 60 minutes or longer</p> <p><input type="checkbox"/> RU1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>VALID GSW rad monitor (RIS-4767) reading GREATER THAN 3000 (3.0 X 10³) CPS and is expected to continue for 60 minutes or longer</p> <p><input type="checkbox"/> RU1.5 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>VALID RHRSW & ESW rad monitor (RM-1997) reading GREATER THAN 800 (8.0 X 10²) CPS and is expected to continue for 60 minutes or longer</p> <p><input type="checkbox"/> RU1.6 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>VALID Rupture Disc rad monitor (RM-4268) reading GREATER THAN 1000 (1.0 X 10³) CPS and is expected to continue for 60 minutes or longer</p> <p><input type="checkbox"/> RU1.7 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates GREATER THAN 2 times ODA limits and is expected to continue for 60 minutes or longer</p>		1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF
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Hazardous Materials	Onsite Rad Conditions	None		<p>RA2 Damage to Spent Fuel or Loss of Water Level that Has Resulted or Will Result in the Uncovering of Spent Fuel Outside the Reactor Vessel</p> <p><input type="checkbox"/> RA2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Report of <u>ANY</u> of the following due to damage to spent fuel or loss of water level:</p> <ul style="list-style-type: none">a. VALID Hi-Ram alarm for <u>ANY</u> of the following ARMs:<ul style="list-style-type: none">• RM 9163 (Refueling Floor North End)• RM 9164 (Refueling Floor South End)• RM 9153 (New Fuel Storage)• RM 9178 (Spent Fuel Storage Area).ORb. VALID reading GREATER THAN 10 millirem/hr for <u>ANY</u> of the following ARMs:<ul style="list-style-type: none">• RM 9163 (Refueling Floor North End)• RM 9164 (Refueling Floor South End)• RM 9153 (New Fuel Storage Area)ORc. VALID reading GREATER THAN 100 millirem/hr for ARM RM 9178 (Spent Fuel Storage Area) <p><input type="checkbox"/> RA2.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>VALID WR GEMAC Floodup Indication (LI-4541) LESS THAN 450 inches that will result in spent fuel becoming uncovered</p> <p>RA3 Rise in Radiation Levels Within the Facility That Impedes Operation of Systems Required to Maintain Plant Safety Functions</p> <p><input type="checkbox"/> RA3.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>VALID area radiation levels GREATER THAN 15 millirem/hr in <u>ANY</u> of the following areas:</p> <ul style="list-style-type: none">• Control Room ARM (RM-9162)• Central Alarm Station (by survey)		1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	<p>RU2 UNPLANNED Rise in Plant Radiation Levels</p> <p><input type="checkbox"/> RU2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>UNPLANNED VALID Refuel Floor ARM reading rise with an UNPLANNED water level drop of reactor cavity, fuel pool, or fuel transfer canal as indicated by <u>ANY</u> of the following:</p> <ul style="list-style-type: none">• Report to Control Room• Valid fuel pool level indication (LI-3413) LESS THAN 36 feet and lowering• Valid WR GEMAC Floodup indication (LI-4541) coming on scale <p><input type="checkbox"/> RU2.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Any UNPLANNED VALID ARM reading GREATER THAN 1000 times normal"</p> <p><input type="checkbox"/> RU2.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Any UNPLANNED VALID radiation survey results GREATER THAN 1000 times normal" levels</p> <p>"Normal levels can be considered as the highest reading in the past twenty-four hours excluding the current peak value</p>		1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF																																																																																																		
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Hazards	Natural & Destructive Phenomenon	<table><tr><th colspan="2">Safe Shutdown/Vital Areas</th></tr><tr><th>Category</th><th>Area</th></tr><tr><td>Electrical Power</td><td>1G31 DG and Day Tank Rooms, 1G21 DG and Day Tank Rooms, Battery Rooms, Essential Switchgear Rooms, Cable Spreading Room</td></tr><tr><td>Heat Sink / Coolant Supply</td><td>Torus Room, Intake Structure, Pumphouse</td></tr><tr><td>Containment</td><td>Drywell, Torus</td></tr><tr><td>Emergency Systems</td><td>NE, NW, SE Corner Rooms, HPCI Room, RCIC Room, RHR Valve Room, North CRD Area, South CRD Area, CSTs</td></tr><tr><td>Other</td><td>Control Building, Remote Shutdown Panel 1C388 Area, Panel 1C55/56 Area, SBGT Room</td></tr></table> <table><tr><th colspan="2">Systems of Concern</th></tr><tr><td>-</td><td>Reactivity Control</td></tr><tr><td>-</td><td>Containment (Drywell/Torus)</td></tr><tr><td>-</td><td>RHR/Core Spray/SRVs</td></tr><tr><td>-</td><td>HPCI/RCIC</td></tr><tr><td>-</td><td>RHRSW/River Water/ESW</td></tr><tr><td>-</td><td>Onsite AC Power/EDGs</td></tr><tr><td>-</td><td>Offsite AC Power</td></tr><tr><td>-</td><td>Instrument AC</td></tr><tr><td>-</td><td>DC Power</td></tr><tr><td>-</td><td>Remote Shutdown Capability</td></tr></table>		Safe Shutdown/Vital Areas		Category	Area	Electrical Power	1G31 DG and Day Tank Rooms, 1G21 DG and Day Tank Rooms, Battery Rooms, Essential Switchgear Rooms, Cable Spreading Room	Heat Sink / Coolant Supply	Torus Room, Intake Structure, Pumphouse	Containment	Drywell, Torus	Emergency Systems	NE, NW, SE Corner Rooms, HPCI Room, RCIC Room, RHR Valve Room, North CRD Area, South CRD Area, CSTs	Other	Control Building, Remote Shutdown Panel 1C388 Area, Panel 1C55/56 Area, SBGT Room	Systems of Concern		-	Reactivity Control	-	Containment (Drywell/Torus)	-	RHR/Core Spray/SRVs	-	HPCI/RCIC	-	RHRSW/River Water/ESW	-	Onsite AC Power/EDGs	-	Offsite AC Power	-	Instrument AC	-	DC Power	-	Remote Shutdown Capability	<p>HA1 Natural and Destructive Phenomena Affecting VITAL AREAS</p> <p><input type="checkbox"/> HA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Receipt of the Amber Operating Basis Earthquake Light and the vibrating seismic alarm on 1C35 (+/- 0.05 gravity)</p> <p>AND</p> <p>Earthquake confirmed by ANY of the following:</p> <ul style="list-style-type: none">• Report of an earthquake felt on-site• National Earthquake Information Center (1-303-273-8500)• Control Room indication of degraded performance of systems required for the safe shutdown of the plant <p><input type="checkbox"/> HA1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Tornado strike, high winds greater than 95MPH or a vehicle crash resulting in:</p> <ul style="list-style-type: none">• VISIBLE DAMAGE to ANY of the following structures:<ul style="list-style-type: none">- Emergency Diesel Generator Rooms- Control Building- Reactor Building- Pumphouse- Intake Structure- Condensate Storage Tank Area <p>OR</p> <ul style="list-style-type: none">• Control Room indication of degraded performance of a System of Concern <p><input type="checkbox"/> HA1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Turbine failure-generated PROJECTILES resulting in:</p> <ul style="list-style-type: none">• VISIBLE DAMAGE to or penetration of any of the following structures:<ul style="list-style-type: none">- Emergency Diesel Generator Rooms- Control Building- Reactor Building- Condensate Storage Tank Area <p>OR</p> <ul style="list-style-type: none">• Control Room indication of degraded performance of a System of Concern <p><input type="checkbox"/> HA1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Internal flooding in <u>ANY</u> Safe Shutdown/Vital Area that results in:</p> <ul style="list-style-type: none">• an electrical shock hazard that precludes access to operate or monitor safety equipment <p>OR</p> <ul style="list-style-type: none">• Control Room indication of degraded performance of a System of Concern <p><input type="checkbox"/> HA1.5 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Report to Control Room of VISIBLE DAMAGE affecting a Safe Shutdown/Vital Area</p> <p><input type="checkbox"/> HA1.6 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>River level above 757 feet</p> <p><input type="checkbox"/> HA1.7 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>River Water Supply Pit low level</p>		1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	<p>HU1 Natural and Destructive Phenomena Affecting the PROTECTED AREA</p> <p><input type="checkbox"/> HU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Seismic event identified by <u>ANY</u> 2 of the following:</p> <ul style="list-style-type: none">• Seismic event confirmed per AOP 901, Earthquake• Report of an earthquake felt on-site• National Earthquake Information Center (1-303-273-8500) <p><input type="checkbox"/> HU1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Tornado striking within the PROTECTED AREA, or within the switchyard, with <u>NQ</u> confirmed damage to a Safe Shutdown/Vital Area or Control Room indication of degraded performance of a System of Concern</p> <p><input type="checkbox"/> HU1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>High winds greater than 95 mph on-site with <u>NQ</u> confirmed damage to a Safe Shutdown/Vital Area or Control Room indication of degraded performance of a System of Concern</p> <p><input type="checkbox"/> HU1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Internal flooding that has the potential to affect safety related equipment required by Technical Specifications for the current operating mode in <u>ANY</u> Safe Shutdown/Vital Area</p> <p><input type="checkbox"/> HU1.5 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Turbine failure resulting in casing penetration or damage to turbine or generator seals</p> <p><input type="checkbox"/> HU1.6 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>River level above 757 feet</p>		1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF																				
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Fire or Explosion	None	None		<p>HA2 FIRE or EXPLOSION Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown</p> <p><input type="checkbox"/> HA2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>FIRE or EXPLOSION resulting in VISIBLE DAMAGE to any Safe Shutdown/Vital Area or Control Room indication of degraded performance of a System of Concern</p>		1	2	3	4	5	DEF	<p>HU2 Fire Within the PROTECTED AREA <u>NOT</u> Extinguished Within 15 Minutes of Detection or EXPLOSION Within the PROTECTED AREA</p> <p>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the duration has exceeded, or will likely exceed, the applicable time.</p> <p><input type="checkbox"/> HU2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>FIRE <u>NOT</u> extinguished within 15 minutes of Control Room notification or verification of a Control Room FIRE alarm in <u>ANY</u> Safe Shutdown/Vital Area</p> <p><input type="checkbox"/> HU2.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>EXPLOSION within the PROTECTED AREA</p>		1	2	3	4	5	DEF	1	2	3	4	5	DEF																																																																																																																				
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None	None		<p>HA4 HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat</p> <p><input type="checkbox"/> HA4.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by DAEC Security Shift Supervision.</p> <p><input type="checkbox"/> HA4.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>A validated notification from the NRC of an airliner attack threat within 30 minutes of the site</p>		1	2	3	4	5	DEF	1	2	3	4	5	DEF	<p>HU4 Confirmed SECURITY CONDITION or threat which indicates a potential degradation in the level of safety of the plant</p> <p><input type="checkbox"/> HU4.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>A SECURITY CONDITION that does <u>NOT</u> involve a HOSTILE ACTION as reported by DAEC Security Shift Supervision.</p> <p><input type="checkbox"/> HU4.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>A credible site specific security threat notification.</p> <p><input type="checkbox"/> HU4.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>A validated notification from NRC providing information of an aircraft threat.</p>		1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF																																																																																																									
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Emergency Director Judgment	None	<p>HS2 Control Room Evacuation Has Been Initiated and Plant Control Cannot Be Established</p> <p><input type="checkbox"/> HS2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Control Room evacuation has been initiated</p> <p>AND</p> <p>Control of the plant cannot be established per AOP 915 within 20 minutes</p>		1	2	3	4	5	DEF	<p>HA6 Other Conditions Exist Which in the Judgment of the Emergency Director (OSM, EC or ER&RD) Warrant Declaration of an Alert</p> <p><input type="checkbox"/> HA6.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Other conditions exist which in the judgment of the Emergency Director (OSM, EC or ER&RD) indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels</p>		1	2	3	4	5	DEF	<p>HU6 Other Conditions Exist Which in the Judgment of the Emergency Director (OSM, EC or ER&RD) Warrant Declaration of a NOUE</p> <p><input type="checkbox"/> HU6.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Other conditions exist which in the judgment of the Emergency Director (OSM, EC or ER&RD) indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs</p>		1	2	3	4	5	DEF																																																																																																																				
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<p>HG2 Other Conditions Exist Which in the Judgment of the Emergency Director (OSM, EC or ER&RD) Warrant Declaration of a General Emergency</p> <p><input type="checkbox"/> HG2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Other conditions exist which in the judgment of the Emergency Director (OSM, EC or ER&RD) indicate that events are in progress or have occurred which involve actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels off-site for more than the immediate site area</p>	1	2	3	4	5	DEF	<p>HS3 Other Conditions Exist Which in the Judgment of the Emergency Director (OSM, EC or ER&RD) Warrant Declaration of a Site Area Emergency</p> <p><input type="checkbox"/> HS3.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Other conditions exist which in the judgment of the Emergency Director (OSM, EC or ER&RD) indicate that events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or; (2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary</p>		1	2	3	4	5	DEF	<p>HA6 Other Conditions Exist Which in the Judgment of the Emergency Director (OSM, EC or ER&RD) Warrant Declaration of an Alert</p> <p><input type="checkbox"/> HA6.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Other conditions exist which in the judgment of the Emergency Director (OSM, EC or ER&RD) indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels</p>		1	2	3	4	5	DEF	<p>HU6 Other Conditions Exist Which in the Judgment of the Emergency Director (OSM, EC or ER&RD) Warrant Declaration of a NOUE</p> <p><input type="checkbox"/> HU6.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table></p> <p>Other conditions exist which in the judgment of the Emergency Director (OSM, EC or ER&RD) indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs</p>		1	2	3	4	5	DEF																																																																																																															
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Modes:

1

2

3

4

5

DEF

Power OperationStartupHot ShutdownCold ShutdownRefuelingDefueled

Modes 1, 2, 3

CONTROLLED DOCUMENT

Duane Arnold Energy Center

EAL-01 Emergency Action Level Matrix, Rev. 11

Approved: Mark Fritz

Manager Emergency Preparedness

GENERAL EMERGENCY		SITE AREA EMERGENCY		ALERT		UNUSUAL EVENT																					
System Malfunc.	Loss of Power	<div>SG1 Prolonged Loss of All Offsite and All Onsite AC Power to Essential Busses</div> <div><div><div>SG1.1</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>Loss of all offsite and all onsite AC power to 1A3 and 1A4 AND ANY of THE FOLLOWING:<ul style="list-style-type: none">Restoration of power to either 1A3 or 1A4 in less than 4 hours is <u>NOT</u> likelyRPV water level cannot be determinedRPV water level is LESS THAN +15 inches</div>	<div>SS1 Loss of All Offsite and All Onsite AC Power to Essential Busses for 15 Minutes or Longer</div> <div>Note: The Emergency Director (OSM, EC or ER&RD) should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</div> <div><div><div>SS1.1</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>Loss of all offsite and all onsite AC power to 1A3 and 1A4 for 15 minutes or longer</div> <div>SS3 Loss of All Vital DC Power for 15 Minutes or Longer</div> <div>Note: The Emergency Director (OSM, EC or ER&RD) should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</div> <div><div><div>SS3.1</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>Less than 105 VDC bus voltage on BOTH Div 1 and Div 2 125 VDC busses for 15 minutes or longer</div>	<div>SA5 AC Power Capability to Essential Busses Reduced to a Single Power Source for 15 Minutes or Longer Such That Any Additional Single Failure Would Result in Station Blackout</div> <div>Note: The Emergency Director (OSM, EC or ER&RD) should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</div> <div><div><div>SA5.1</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>AC power capability to 1A3 or 1A4 busses reduced to a single power source for 15 minutes or longer</div> <div>AND</div> <div>Any additional single power source failure will result in station blackout</div>	<div>SU1 Loss of All Offsite AC Power to Essential Busses for 15 Minutes or longer</div> <div>Note: The Emergency Director (OSM, EC or ER&RD) should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</div> <div><div><div>SU1.1</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>Loss of all offsite AC power to 1A3 and 1A4 for 15 minutes or longer</div>																						
	RPS Failure	<div>SG2 Automatic Scram and All Manual Actions Fail to Shutdown the Reactor and Indication of an Extreme Challenge to the Ability to Cool the Core Exists</div> <div><div><div>SG2.1</div><div>1</div><div>2</div><div></div><div></div><div></div><div></div></div></div> <div>An automatic scram failed to shutdown the reactor AND ALL manual actions to lower reactor power below 5% power <u>are unsuccessful</u> AND Either of the following exist or have occurred due to continued power generation:<ul style="list-style-type: none">RPV water level cannot be restored and maintained GREATER THAN -25 inchesHeat Capacity Limit (HCL) Curve (EOP Graph 4) exceeded</div>	<div>SS2 Automatic Scram Fails to Shutdown the Reactor and Manual Actions Taken From 1C05 are <u>NOT</u> Successful in Shutting Down the Reactor</div> <div><div><div>SS2.1</div><div>1</div><div>2</div><div></div><div></div><div></div><div></div></div></div> <div>An automatic scram failed to shutdown the reactor AND NONE of the following manual actions taken at 1C05 <u>are successful</u> in lowering reactor below 5% power:<ul style="list-style-type: none">Manual Scram PushbuttonsMode Switch to ShutdownAlternate Rod Insertion (ARI)</div>	<div>SA2 Automatic Scram Fails to Shutdown the Reactor and the Manual Actions Taken From 1C05 are Successful in Shutting Down the Reactor</div> <div><div><div>SA2.1</div><div>1</div><div>2</div><div></div><div></div><div></div><div></div></div></div> <div>An automatic scram failed to shutdown the reactor AND ANY of the following manual actions taken at 1C05 <u>are successful</u> in lowering reactor power below 5% power:<ul style="list-style-type: none">Manual Scram PushbuttonsMode Switch to ShutdownAlternate Rod Insertion (ARI)</div>	None																						
	Inability to Reach or Maintain Shutdown Conditions	None	None	None	None	<div>SU2 Inability to Reach Required Shutdown Within Technical Specification Limits</div> <div><div><div>SU2.1</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>Plant is not brought to required operating mode within applicable Technical Specifications LCO Action Statement Time</div>																					
	Inst. / Comm.	None	<div>SS6 Inability to Monitor a SIGNIFICANT TRANSIENT in Progress</div> <div>Note: The Emergency Director (OSM, EC or ER&RD) should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</div> <div><div><div>SS6.1</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>Loss of approximately 75% or more of <u>ANY</u> of the following for 15 minutes or longer:<ul style="list-style-type: none">1C03, 1C04 and 1C05 annunciators1C03, 1C04 and 1C05 indicationsradiation monitor indicationsindicators needed to monitor criticality, or core heat removal, or Fission Product Barrier statusAND A SIGNIFICANT TRANSIENT is in progress AND Compensatory indications are unavailable</div>	<div>SA4 UNPLANNED Loss of Safety System Annunciation or Indication in the Control Room With Either (1) a SIGNIFICANT TRANSIENT in Progress, or (2) Compensatory Indicators Unavailable</div> <div>Note: The Emergency Director (OSM, EC or ER&RD) should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</div> <div><div><div>SA4.1</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>UNPLANNED loss of approximately 75% or more of <u>ANY</u> of the following for 15 minutes or longer:<ul style="list-style-type: none">1C03, 1C04 and 1C05 annunciators1C03, 1C04 and 1C05 indicationsradiation monitor indicationsAND EITHER of the following conditions exist:<ul style="list-style-type: none">A SIGNIFICANT TRANSIENT is in progress.Compensatory indications are unavailable</div>	<div>SU3 UNPLANNED Loss of Safety System Annunciation or Indication in the Control Room for 15 Minutes or longer</div> <div>Note: The Emergency Director (OSM, EC or ER&RD) should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</div> <div><div><div>SU3.1</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>UNPLANNED loss of approximately 75% or more of <u>ANY</u> of the following for 15 minutes or longer:<ul style="list-style-type: none">1C03, 1C04 and 1C05 annunciators1C03, 1C04 and 1C05 indicationsradiation monitor indications</div> <div>SU6 Loss of All Onsite or Offsite Communications Capabilities</div> <div><div><div>SU6.1</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>Loss of <u>ALL</u> of the following onsite communication methods affecting the ability to perform routine operations:<ul style="list-style-type: none">Plant Operations Radio SystemIn-Plant TelephonesPlant Paging System</div> <div><div><div>SU6.2</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>Loss of <u>ALL</u> of the following offsite communication methods affecting the ability to perform offsite notifications:<ul style="list-style-type: none">All telephone lines (commercial)Cell phones (including fixed cell phone system)Control Room fixed satellite phonesAll-Call Phone SystemEmergency Notification System (ENS)FTS Phone System</div>																						
	Fuel Clad Degradation	None	None	None	None	<div>SU4 Fuel Clad Degradation</div> <div><div><div>SU4.1</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>Pretreatment Offgas System (RM-4104) Hi-Hi Radiation Alarm</div> <div><div><div>SU4.2</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>Reactor Coolant sample activity value GREATER THAN 2.0 µCi/gm dose equivalent I-131</div>																					
RCS Leakage	None	None	None	None	<div>SU5 RCS Leakage</div> <div><div><div>SU5.1</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>Unidentified drywell leakage GREATER THAN 10 gpm</div> <div><div><div>SU5.2</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>Identified drywell leakage GREATER THAN 25 gpm</div>																						
Inadvertent Criticality	None	None	None	None	<div>SU8 Inadvertent Criticality</div> <div><div><div>SU8.1</div><div></div><div></div><div></div><div>3</div><div></div><div></div></div></div> <div>An UNPLANNED sustained positive period observed on nuclear instrumentation</div>																						
ISFSI Events	Cask Confine. Boundary	None	None	None	<div>EU1 Damage To A Loaded Cask CONFINEMENT BOUNDARY</div> <div><div><div>EU1.1</div></div></div> <div>Damage to the Dry Shield Canister of a loaded cask.</div>																						
	Security	None	None	None	Refer to Security EALs in the Hazard recognition category																						
Fission Product Barriers	<div><div><div>FG1</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>Loss of ANY Two Barriers AND Loss or Potential Loss of the Third Barrier (Table F-1)</div>	<div><div><div>FS1</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>Loss or Potential Loss of ANY Two Barriers (Table F-1)</div>	<div><div><div>FA1</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS Barrier (Table F-1)</div>	<div><div><div>FU1</div><div>1</div><div>2</div><div>3</div><div></div><div></div><div></div></div></div> <div>ANY Loss or ANY Potential Loss of Primary Containment Barrier (Table F-1)</div>																							
	<div>Table F-1 FISSION PRODUCT BARRIER MATRIX</div> <table><tr><th colspan="2">Fuel Clad Barrier</th><th colspan="2">RCS Barrier</th><th colspan="2">Primary Containment Barrier</th></tr><tr><th><div>Loss</div></th><th><div>Potential Loss</div></th><th><div>Loss</div></th><th><div>Potential Loss</div></th><th><div>Loss</div></th><th><div>Potential Loss</div></th></tr><tr><td><div><div><div>RADIATION/CORE DAMAGE</div><div>Fuel damage assessment (PASAP 7.2) indicates at least 5% fuel clad damage</div><div>OR</div><div>Drywell Area Hi Range Rad Monitor, RIM-9184A or B reading GREATER THAN 700 Rem/hr</div><div>OR</div><div>Torus Area Hi Range Rad Monitor, RIM-9185A or B reading GREATER THAN 30 Rem/hr</div><div>OR</div><div>Coolant activity GREATER THAN 300 µCi/gm DOSE EQUIVALENT I-131</div></div></div></td><td><div><div><div>RPV LEVEL</div><div>RPV Level cannot be restored and maintained above +15 inches or cannot be determined</div></div></div></td><td><div><div><div>RADIATION/CORE 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drywell pressure</div><div>OR</div><div>Drywell pressure response <u>NOT</u> consistent with LOCA conditions</div></div></div>	<div><div><div>RADIATION/CORE DAMAGE</div><div>Drywell Area Hi Range Rad Monitor, RIM-9184A or B reading GREATER THAN 3000 Rem/hr</div><div>OR</div><div>Torus Area Hi Range Rad Monitor, RIM-9185A or B reading GREATER THAN 100 Rem/hr</div><div>OR</div><div>Fuel damage assessment (PASAP 7.2) indicates at least 20% fuel clad damage</div></div></div> <div><div><div>RPV LEVEL</div><div>SAG entry required</div></div></div> <div><div><div>PRIMARY CONTAINMENT ATMOSPHERE</div><div>Torus pressure reaches 53 psig and rising</div><div>OR</div><div>Drywell or Torus H₂ cannot be determined to be LESS THAN 6% and Drywell or Torus O₂ cannot be determined to be LESS THAN 5%</div><div>OR</div><div>RPV pressure and Torus water temperature cannot be maintained below the Heat Capacity Limit (EOP Graph 4)</div></div></div> <div><div><div>EMERGENCY DIRECTOR JUDGMENT</div><div>Any 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<div>ONE BARRIER AFFECTED</div> <div><div><div>L</div><div>P</div><div>L</div><div>P</div><div>L</div><div>P</div></div><div><div>CLAD</div><div>RCS</div><div>CNTMT</div></div><div><div>1/2</div><div>1/1</div></div><div><div>FU1</div><div>UNUSUAL EVENT</div></div><div><div>FA1</div><div>ALERT</div></div></div> <div><div>TWO BARRIERS AFFECTED</div><div><div><div>L</div><div>P</div><div>L</div><div>P</div><div>L</div><div>P</div></div><div><div>CLAD</div><div>RCS</div><div>CNTMT</div></div><div><div>2/3</div></div><div><div>FS1</div><div>SITE AREA EMERGENCY</div></div></div><div><div>THREE BARRIERS AFFECTED</div><div><div><div>L</div><div>P</div><div>L</div><div>P</div><div>L</div><div>P</div></div><div><div>CLAD</div><div>RCS</div><div>CNTMT</div></div><div><div>3/3</div></div><div><div>LOSS OF AT LEAST 2 BARRIERS?</div></div><div><div>YES</div><div>NO</div></div><div><div>FG1</div><div>GENERAL EMERGENCY</div></div></div></div></div>																											

| Modes: 1 2 3 4 5 DEF Power Operation Startup Hot Shutdown Cold Shutdown Refueling Defueled Modes 1, 2, 3 CONTROLLED DOCUMENT Duane Arnold Energy Center EAL-01 Emergency Action Level Matrix, Rev. 11 Approved: Mark Fritz Manager Emergency Preparedness | | | | | |