EXAMINATION ANSWER KEY

22-1 (2023-301) NRC Exam - SRO

76	ID: 28021	Points: 1.00

Unit 2 was operating at near rated power, when the 'A' and 'B' NR RPV Level transmitters failed DOWNSCALE simultaneously.

The FWLC system will ___(1)___ and the Unit Supervisor will direct ___(2)___.

A. (1) enter Setpoint Setdown
(2) reducing Recirc flow to 56 Mlbm/hr, per DOA 0600-01, TRANSIENT LEVEL CONTROL

B. (1) enter Setpoint Setdown
(2) manually matching feed flow and steam flow per DOA 0600-01, TRANSIENT LEVEL CONTROL

C. (1) transfer to Single Element Control
(2) inserting a manual scram per DGP 02-03, REACTOR SCRAM

D. (1) transfer to Single Element Control
(2) depressing 1-ELEM button per DAN 902-5 G-8, 1-ELEMENT FW CONTROL ACTIVE AT HI FLOW

Answer: B

Answer Explanation

With two of the three RPV level instruments failing low, the FWLCS will enter setpoint setdown and begin to drive RPV level to the preset setpoint of -10 inches. To prevent a reactor scram, the Unit Supervisor will direct entering the DOA for transient level control and then manually controlling RPV level, by matching steam and feed flow.

Question 76 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28021
User-Defined ID:	28021
Cross Reference Number:	
Topic:	76 - 259002.A2.03
Num Field 1:	
Num Field 2:	
Text Field:	
Comments:	Objective: DRE259LN002.08 Reference: DAN 902-5 G-7, DOA 0600-01 K/A: 259002.A2.03 3.8 / 3.9 K/A: Ability to (a) predict the impacts of the following on the Reactor Water Level Control System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Loss of reactor water level input CFR: 41.5 / 43.5 / 45.6 PRA: No Level: High Safety Function: 2 Pedigree: Bank History: None **SRO Only Criteria: 10CFR55.43(b)(5) -** Assessment of facility conditions and selection of appropriate procedures during normal, abnormal and emergency situation. Conditions and limitations in the facility license. Explanation: A. Incorrect - Plausible because Reducing Recirc flow would be correct, but NOT below 58 Mlbm/hr. B. Correct - With two of the three RPV level instruments failing low, the FWLCS will enter setpoint setdown and begin to drive RPV level to the preset setpoint of -10 inches. To prevent a reactor scram, the Unit Supervisor will direct entering the DOA for transient level control and then manually controlling RPV level, by matching steam and feed flow. C. Incorrect - Single element will NOT be entered unless a steam or feed flow signal (not Level) was lost. Plausible because this would be plausible if the steam or flow signal had been lost vs Level indication. D. Incorrect - Single element will NOT be entered unless a steam or feed flow signal (not Level) was lost. Plausible because this would be plausible if the steam or flow signal had been lost vs Level indication. **REQUIRED REFERENCES:** None.

77 **ID: 23799** **Points: 1.00**

Unit 3 was operating at 65% power, when the NSO reported that a Jet Pump failed on the “A” Recirc loop.

This would be indicated by a drop in core thermal power and a ___(1)___ in Recirc pump flow.

The Unit Supervisor is required to direct securing ___(2)___ immediately and enter DOA 0202-01, RECIRC PUMP TRIP.

A. (1) drop
(2) ONLY the “A” Recirc Pump

B. (1) rise
(2) ONLY the “A” Recirc Pump

C. (1) drop
(2) BOTH Recirc Pumps and scramming the Reactor

D. (1) rise
(2) BOTH Recirc Pumps and scramming the Reactor

Answer: B

Answer Explanation

One of the indications of a failed jet pump would be an drop in core thermal power and a RISE in Recirc Pump flow for a given speed. The Unit Supervisor then would be required to make the decision that the Jet Pump failed and direct ONLY the affected Recirc Pump secured.

Question 77 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	23799
User-Defined ID:	23799
Cross Reference Number:	
Topic:	77 - 202001.A2.01
Num Field 1:	
Num Field 2:	
Text Field:	
Comments:	Objective: DRE202LN001.12 Reference: DOA 0201-01 K/A: 202001.A2.01 3.9 / 4.1 K/A: Ability to (a) predict the impacts of the following on the Recirculation System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Jet pump failure CFR: 41.5 / 43.5 / 45.6 Level: High PRA: No Safety Function: 1 & 4 Pedigree: Bank History: 10-1 Cert, 12-1 Cert **SRO Only Criteria: 10CFR55.43(b)(5) -** Assessment of facility conditions and selection of appropriate procedures during normal, abnormal and emergency situation. Conditions and limitations in the facility license. Explanation: A. Incorrect - Plausible because second part is correct. A failed pump could lead to belief that flow would drop. Recirc pump flow would rise with a failure of a jet pump. B. Correct - One of the indications of a failed jet pump would be an drop in core thermal power and a RISE in Recirc Pump flow for a given speed. The Unit Supervisor then would be required to make the decision that the Jet Pump failed and direct ONLY the affected Recirc Pump secured. C. Incorrect - Plausible because A failed pump could lead to belief that flow would drop. Recirc pump flow would rise with a failure of a jet pump. Only the affected Recirc Pump should be secured. If the transient caused a SCRAM both pumps would be secured. D. Incorrect - Plausible because first part is correct. Only the affected Recirc Pump should be secured. If the transient caused a SCRAM both pumps would be secured. **REQUIRED REFERENCES:** None

78 **ID: 14724** **Points: 1.00**

Unit 2 was operating at near rated power.

With regards to the SBLC system which set of parameters below would require an LCO entry?

A tank level of ___(1)___ gallons;

A tank temperature of ___(2)___ ˚F;

A Sodium Pentaborate concentration of ___(3)___ % by weight.

(Reference provided)

A. (1) 3500
(2) 90
(3) 14.5

B. (1) 3600
(2) 115
(3) 14.5

C. (1) 3700
(2) 90
(3) 15.0

D. (1) 3800
(2) 115
(3) 15.5

Answer: B

Answer Explanation

Utilizing the figure 3.1.7-1 of I.T.S. 3.1.7, the only set of parameters that are NOT in the acceptable operating range is 14.5% / 3600 gallons / 115˚F. The parameters are NOT in the acceptable range because of the temperature value.

Question 78 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	14724
User-Defined ID:	14724
Cross Reference Number:	
Topic:	78 - Generic.2.1.25
Num Field 1:	0.00
Num Field 2:	0.00
Text Field:	
Comments:	Objective: DRE211LN001.07 Reference: T.S. 3.1.7 figure 3.1.7-1 K/A: Generic 2.1.25 3.9 / 4.2 K/A: Ability to interpret reference materials, such as graphs, curves, and tables (reference potential) CFR: 41.10 / 43.5 / 45.12 PRA: No Level: High Pedigree: Bank History: 12-1 Cert **SRO Criteria: 10CFR55.43(b)(2)** - Facility operating limitations in the technical specifications and their bases. Explanation: A. Incorrect - This is within the acceptable operating region of figure 3.1.7-1. Plausible due to needing to be able to interpret the graph correctly. B. Correct - Utilizing the figure 3.1.7-1 of I.T.S. 3.1.7, the only set of parameters that are NOT in the acceptable operating range is 14.5% / 3600 gallons /115˚F. The parameters are NOT in the acceptable range because of the temperature value. C. Incorrect - This is within the acceptable operating region of figure 3.1.7-1. Plausible due to needing to be able to interpret the graph correctly. D. Incorrect - This is within the acceptable operating region of figure 3.1.7-1. Plausible due to needing to be able to interpret the graph correctly. **REQUIRED REFERENCES:** T.S. 3.1.7, with less than 1 hour times removed

79 **ID: 22454** **Points: 1.00**

DOP 2000-110, Attachment 1: WASTE SURGE TANK RADIOACTIVE WASTE DISCHARGE TO RIVER CARD, contains the calculation for determining the ___(1)___ flowrate and radiological monitor alarm setpoints, and, excluding designees, is REQUIRED to be verified by ___(2)___ .

A. (1) dilution
(2) Unit Supervisor

B. (1) dilution
(2) Shift Manager

C. (1) discharge
(2) Unit Supervisor

D. (1) discharge
(2) Shift Manager

Answer: D

Answer Explanation

Per DOP 2000-110 attachment 1 the calculating for river discharge flowrate must be calculated, then verified by the Shift Manager.

Question 79 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	4.00
System ID:	22454
User-Defined ID:	22454
Cross Reference Number:	
Topic:	79 - Generic.2.3.06
Num Field 1:	
Num Field 2:	
Text Field:	
Comments:	Objective: DRE268LN001.14 Reference: DOP 2000-110 K/A: Generic.2.3.06 3.8 K/A: Ability to approve liquid or gaseous release permits. CFR: 41.13/43.4/45.10 Level: Memory Pedigree: Bank History: 11-1 NRC **SRO Criteria: 10CFR55.43(b)(4)** - Radiations hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions. Explanation: A. Incorrect - The Shift Manager must determine discharge flowrate. Plausible because dilution flowrate is calculated on Attachment 2 but does not require a Shift Manager signature. B. Incorrect - The Shift Manager must determine discharge flowrate. Plausible because dilution flowrate is calculated on Attachment 2 but does not require a Shift Manager signature. C. Incorrect - The Shift Manager must verify calculations prior to release. Plausible because part 1 is correct. Part 2 is plausible because the Unit Supervisor is an SRO licensed individual, but the stem states to exclude designees. D. Correct - Per DOP 2000-110 attachment 1 the calculating for river discharge flowrate must be calculated, then verified by the Shift Manager. **REQUIRED REFERENCES:** None

80 **ID: 28113** **Points: 1.00**

An event has occurred in the plant which is determined to be reportable. At the time that reportability is determined, the Senior NRC Resident Inspector is present in the Control Room.

The Shift Manager informs the Resident of the reportable situation.

Regarding this situation, which statement is correct?

A. Reporting requirements are NOT satisfied.

B. If the Emergency Notification System (ENS) is inoperative, reporting requirements CAN NOT be satisfied.

C. If the Shift Manager logs the time when the Resident inspector was informed, reporting requirements are satisfied.

D. Since waivers of reporting requirements are at the discretion of the Resident Inspector, it will be up to the Resident whether further notification is required.

Answer: A

Answer Explanation

Per LS-AA-1010-General Guidance on Reportability Requirements - Verbal communications with the Resident Inspector or other NRC staff, do not satisfy 10 CFR reporting requirements.

Question 80 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	0
Difficulty:	0.00
System ID:	28113
User-Defined ID:	28113
Cross Reference Number:	
Topic:	80 - Generic 2.4.30 (1)
Num Field 1:	
Num Field 2:	
Text Field:	
Comments:	Objective: 29900LE001 Reference: LS-AA-1010 K/A: Generic 2.4.30 -- / 4.1 K/A: Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator. CFR: 41.10 / 43.5 / 45.11 Level: Memory PRA: No Safety Function: N/A Pedigree: Bank History: None Explanation: A. Correct - Per LS-AA-1010-General Guidance on Reportability Requirements - Verbal communications with the Resident Inspector or other NRC staff, do not satisfy 10 CFR reporting requirements. B. Incorrect - Plausible since it indicates that informing the NRC Resident Inspector is not enough to satisfy ENS reporting requirements but incorrect based on guidance from 10CFR 50.72 to make reports via any means to NRC Operations Center. C. Incorrect - This rests on the premise that notification of the NRC resident inspector satisfies the reporting requirement. This is plausible since non-routine communications with the NRC require notification of the NRC resident inspector IAW OP-AA-106-101. D. Incorrect - This rests on the premise that notification of the NRC resident inspector satisfies the reporting requirement. This is plausible since non-routine communications with the NRC require notification of the NRC resident inspector IAW OP-AA-106-101. **Required Reference:** None

None

81 **ID: 28099** **Points: 1.00**

A Site Area Emergency has been declared.

Prior to the activation of the entire ERO with overall Command and Control in the Control Room, for this specific event the Shift Manager will do which of the following?

1. Classify Event (filling out Nuclear Accident Reporting System [NARS] Form)
2. Notify offsite authorities
3. Direct site Personnel Protective Actions (Assembly/Evacuation)
4. Make the Protective Action Recommendations (PARs)

A. 1, 2, 3 ONLY

B. 1, 3, 4 ONLY

C. 1, 2, 4 ONLY

D. 1, 2, 3, 4

Answer: A

Answer Explanation

Per EP-AA-112-100 CONTROL ROOM OPERATIONS, the Shift Manager assumes command and control for emergency response activities until relieved by the Station Emergency Director. For the conditions listed the Shift Manager would be responsible for Classifying Events, directing site PPA's (i.e. assembly/evacuation), and notifying offsite authorities. PARs are not required at a Site Emergency.

Question 81 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28099
User-Defined ID:	28099
Cross Reference Number:	
Topic:	81 - Generic 2.4.40
Num Field 1:	
Num Field 2:	
Text Field:	
Comments:	Objective: 295L160 Reference: EP-AA-112-100 K/A: Generic 2.4.40 K/A: Knowledge of SRO responsibilities in emergency plan implementing procedures. PRA: No Level: Memory Pedigree: New History: N/A **SRO Only Criteria: 10CFR55.43(b)(5)** - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal and emergency situation. Conditions and limitations in the facility license. Explanation: A. Correct - Per EP-AA-112-100 CONTROL ROOM OPERATIONS, the Shift Manager assumes command and control for emergency response activities until relieved by the Station Emergency Director. For the conditions listed the Shift Manager would be responsible for Classifying Events, directing site PPA's (i.e. assembly/evacuation), and notifying offsite authorities. PARs are not required at a Site Emergency. B. Incorrect - Plausible because 1 and 3 are correct and 4 would be correct for a General Emergency. C. Incorrect - Plausible because 1 and 2 are correct and 4 would be correct for a General Emergency. D. Incorrect - Plausible because 1, 2 and 3 are correct and 4 would be correct for a General Emergency. **REQUIRED REFERENCES:** None

82 **ID: 27592** **Points: 1.00**

Unit 2 was operating at 60% power.

THEN:

- Severe vibrations were reported coming from the Main Turbine
- The reactor was scrammed
- Turbine TRIP pushbuttons on the 902-7 panel were UNSUCCESSFUL
- Reverse power trip did not occur after reactor scram
- Breaker I-2, U2 250 VDC REACTOR BUILDING MCC #2B (MAIN FEED BKR), on 250 VDC MCC #3 trips open during the transient

The SRO will direct ___(1)___ to isolate the steam supply to the Main Turbine, and to control RPV pressure with the ___(2)___.

A. (1) placing BOTH EHC pumps in PTL
(2) ADS valves

B. (1) placing BOTH EHC pumps in PTL
(2) Isolation Condenser

C. (1) shutting the MSIVs and MSL drains
(2) ADS valves

D. (1) shutting the MSIVs and MSL drains
(2) Isolation Condenser

Answer: A

Answer Explanation

(1) Per DOA 5600-01, if the 902-7 panel pushbuttons are not successful, and reverse power does not trip the turbine the EHC pumps should be placed in PTL.

(2) Per DOA 5600-01 immediate actions pressure control should be transitioned to IC or HPCI, but with I-2 on 250 VDC MCC #3 tripped open 250 VDC MCC 2A has no power which powers both IC and HPCI valves/pumps that are required for operation; the Unit Supervisor will then have to direct the ADS valves for pressure control IAW DEOP 100 pressure leg.

Question 82 Info	
Question Type:	Multiple Choice
Status:	Active
Points:	1.00
Time to Complete:	4
Difficulty:	3.00
Topic:	82 - 295005.G.2.1.20
Comments:	Objective: DRE245LN001.08 References: DOA 6000-01, DOA 5600-01, DGP 02-01, DGP 02-03 K/A: 295005 G.2.1.20 --/4.6 K/A: Ability to interpret and execute procedure steps: Main Turbine Generator Trip. Safety Function: 3 CFR: 41.10/43.5/45.12 PRA: No Level: High Pedigree: Bank History: 19-1 NRC **SRO Only Criteria: 10CFR55.43(b)(5)** - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal and emergency situation. Conditions and limitations in the facility license. Justification for SRO Only: By adding the DC breaker trip, the question moves beyond the immediate operator action and requires the SRO to direct another method to control pressure. Explanations: A. Correct - (1) Per DOA 5600-01, if the 902-7 panel pushbuttons are not successful, and reverse power does not trip the turbine the EHC pumps should be placed in PTL. (2) Per DOA 5600-01 immediate actions pressure control should be transitioned to IC or HPCI, but with I-2 on 250 VDC MCC #3 tripped open 250 VDC MCC 2A has no power which powers both IC and HPCI valves/pumps that are required for operation; the Unit Supervisor will then have to direct the ADS valves for pressure control IAW DEOP 100 pressure leg. B. Incorrect - (1) The first part is correct. (2) DOA 5600-01 directs the use of HPCI or Isolation condenser for the conditions listed in the stem, but no power to the 2-1301-3 the IC is not available. Plausible because (1) the first part of the answer is correct. (2) use of IC for pressure control is the next step in DOA 5600-01, but with no power to the 2-1301-3 the IC is not available. C. Incorrect - (1) Closing the MSIVs and MSL drains would isolate the steam supply to the Main Turbine but DOA 5600-01 directs keeping the MSIVs open and to maintain Main Condenser vacuum and steam seal pressure (2) the second part of the question is correct. Plausible because (1) These are the actions to stop an uncontrolled cooldown but without the bypass valves being available DOA 5600-01 directs maintaining Main Condenser vacuum and steam seal pressure for the acceptance of house loads (2) the second part of the question is correct. D. Incorrect - (1) Per DOA 5600-01, if the 902-7 panel pushbuttons are not successful, and reverse power does not trip the turbine the EHC pumps should be secured. (2) the second part of the question is correct Plausible because (1) These are the actions to stop an uncontrolled cooldown but without the bypass valves being available DOA 5600-01 directs maintaining Main Condenser vacuum and steam seal pressure for the acceptance of house loads (2) use of IC for pressure control is the next step in DOA 5600-01, but with no power to the 2-1301-3 the IC is not available. **Required References:** None

83 **ID: 28109** **Points: 1.00**

Unit 2 was operating at rated power.

- A LOCA occurs on Unit 2
- Bus 23-1 tripped on overcurrent
- RPV level is -150 inches and rising slowly
- DW pressure is 6 psig and rising slowly
- Torus temperature is 150°F and rising slowly
- Torus level 16 ft and rising slowly
- RPV pressure is 225 psig and lowering
- All available low pressure ECCS is injecting into the RPV
- HPCI is running in pressure control mode

Subsequently, the Unit 2 Torus develops an unisolable leak resulting in the following conditions:

- Torus level is 12 ft 1 in and lowering slowly
- Actions to restore Torus level are NOT successful

If the Torus level trend continues, which of the following actions are appropriate?

A. Secure ALL ECCS injection into the RPV.

B. Inject with ALL ECCS pumps, including HPCI.

C. Secure HPCI, continue RPV injection into RPV with Core Spray and LPCI.

D. Secure HPCI, inject into the RPV with Core Spray, initiate torus and drywell sprays with LPCI.

Answer: C

Answer Explanation

The conditions given indicate the need to inject with ALL ECCS systems into the RPV since level is below the TAF. However, because torus level is approaching 12 feet, DEOP 200-1 directs HPCI to be tripped if not needed for RPV injection. So, HPCI should be tripped but all other ECCS systems should continue to inject and NOT be diverted until level is >TAF.

Question 83 Info	
Question Type:	Multiple Choice
Status:	Active
Points:	.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28109
User-Defined ID:	28109
Topic:	83 - 295030.A2.01
Comments:	Objective: 29502LP035 Reference: DEOP 200-1, DEOP 100 K/A: 295030.EA2.01 4.0 K/A: Ability to determine and/or interpret the following as they apply to Low Suppression Pool Water Level: Suppression pool level CFR: 41.10 / 43.5 / 45.13 Safety Function: 5 PRA: No Level: High Pedigree: New History: N/A **SRO Criteria: 10CFR55.43(b)(5)** - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. A. Incorrect - With RPV level below TAF, and only 1 CS and 2 LPCI pumps available, all available motor driven ECCS pumps must inject at full flow to restore level above TAF per OP-DR-103-102-1002. This would be done even if potential pump damage could occur. Plausible because with the given drywell pressure, torus level and torus temperature, and assuming full flow from the 2C, 2D LPCI, and 2B Core Spray, Detail N2 LPCI / Core Spray NPSH Limit would be exceeded (torus bottom pressure would be approximately 13-14 psig, the flow at 5000 gpm would exceed the 10 psig curve at 5000 gpm per LPCI pump, and 4750 gpm per the CS pump). The candidate may believe that securing the pumps to protect them outweighs the need for adequate core cooling. B. Incorrect - Plausible because Level is rising with the existing ECCS flow, and HPCI only HPCI being used for Pressure Control. Therefore HPCI is not needed for adequate core cooling and would be secured. C. Correct - The conditions given indicate the need to inject with ALL ECCS systems into the RPV since level is below the TAF. However, because torus level is approaching 12 feet, DEOP 200-1 directs HPCI to be tripped if not needed for RPV injection. So, HPCI should be tripped but all other ECCS systems should continue to inject and NOT be diverted until level is >TAF. D. Incorrect – With the given conditions, per OP-DR-103-102-1002, ALL available LPCI and CS pumps must inject, since RPV level is below TAF. Plausible because containment pressure is 6 psig and rising, and DEOP 0200-01 directs starting torus sprays before drywell pressure reaches 11 psig; and because if both CS pumps were injecting, and RPV level was rising, this would be allowed by OP-DR-103-102-1002. **Required References:** None

None

84 **ID: 27493** **Points: 1.00**

Unit 2 is at 100% power and Unit 3 is in REFUEL.

- Work on the 923-2, 345 kV switchyard panel MOD is in progress.
- Cutting and grinding causes a small fire with a large amount of smoke.
- The fire is extinguished within 3 minutes.

The Unit Supervisor directs ___(1)___ AND ___(2)___.

A. (1) Position CRM ISOL switch to ISOLATE
(2) CREVS remains operable while in Isolate Mode

B. (1) Position CRM ISOL switch to ISOLATE
(2) Declare CREVS inoperable while in Isolate Mode

C. (1) Position CRM AIR FLOW CONTROL switch to OUTSIDE
(2) CREVS remains operable while in Purge Mode.

D. (1) Position CRM AIR FLOW CONTROL switch to OUTSIDE
(2) Declare CREVS inoperable while in Purge Mode.

Answer: D

Answer Explanation

With a fire in the control room causing smoke or noxious fumes entry is required into DOA 5750-04. If the origin of the smoke is from inside the control room then Step D.5 requires placing Main Control Room HVAC to the PURGE MODE. While in the Purge Mode of operation CREVs is inoperable per Tech Spec 3.7.4.

Question 84 Info	
Question Type:	Multiple Choice
Status:	Active
Points:	1.00
Time to Complete:	4
Difficulty:	4.00
System ID:	27493
User-Defined ID:	27493
Topic:	84 - 600000.A2.05
Comments:	Objective: 28800LK004 Reference: DOA 5750-04, T.S. 3.7.4, DOP 5750-05 K/A: 600000 A2.05 -- / 3.2 K/A: Ability to determine and/or interpret the following as they apply to Plant Fire On Site: Ventilation alignment necessary to secure affected area CFR: 45.8 Safety Function: 8 Level: High Pedigree: Bank History: 18-1 NRC **SRO Criteria: 10CFR55.43(b)(5)** - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. Explanation: SRO only due to the fact that the On Site Fire would require entry into multiple DOA.s and include Operability calls based on Tech Spec compliance A. Incorrect - With the source of the smoke from in the Control Room then the correct mode would be would be PURGE. Plausible because step D.2 of DOA 5750-04, has a decision point on whether to go to D.5 or D.8. This would be correct if D.8 was chosen. B. Incorrect - With the source of the smoke from in the Control Room then the correct mode would be PURGE. In addition, CREVs would be operable in Isolate Mode. Plausible because step D.2 of DOA 5750-04, has a decision point on whether to go to D.5 or D.8. This would be correct if D.8 was chosen. The second part is correct C. Incorrect - The first part is correct. With a fire in the control room causing smoke or noxious fumes entry is required into DOA 5750-04, SMOKE, NOXIOUS FUMES OR AIRBORNE CONTAMINANT IN THE CONTROL ROOM. If the origin of the smoke is from inside the control room, then Step D.5 requires placing Main Control Room HVAC to the PURGE MODE. In the Purge Mode with the dampers selected for OUTSIDE, the T.S for Control Room Envelope is not met and the system must be declared INOP. Plausible because the first part is correct (smoke purge is required), and the candidate may mistakenly believe the CREVs system is still OPERABLE. D. Correct - With a fire in the control room causing smoke or noxious fumes entry is required into DOA 5750-04, SMOKE, NOXIOUS FUMES OR AIRBORNE CONTAMINANT IN THE CONTROL ROOM. If the origin of the smoke is from inside the control room, then Step D.5 requires placing Main Control Room HVAC to the PURGE MODE. While in the Purge Mode of operation CREVs is inoperable per Tech Spec 3.7.4 **Required References:** None

None

85	**ID: 10318**	**Points: 1.00**

Unit 3 was at rated conditions when a transient occurred.

- A leak into the Drywell is occurring
- An Isolation Condenser steam leak occurred and was isolated
- Isolation Condenser area temperature is 170°F and is too high for personnel access
- Reactor Building D/P is -0.25 inWC
- Valid Reactor Building Ventilation isolations are present on each of the following parameters:
  - ♦ Drywell Pressure
  - ♦ Reactor Water Level
  - ♦ Reactor Building Exhaust Radiation

Restarting the Reactor Building Ventilation would allow safer access to the Isolation Condenser area...

A. but is NOT allowed due to the Reactor Building Exhaust Radiation isolation.

B. but is NOT allowed due to the Reactor Water Level isolation.

C. and may be performed after bypassing the isolation signals.

D. but is NOT allowed due to the Drywell Pressure isolation.

Answer: A

Answer Explanation

Only the drywell and RPV water level isolations are allowed to be bypassed since they do not indicate a release hazard. Reactor building exhaust radiation above the isolation setpoint would be indicated of a potential radioactive release problem and would not be allowed to be bypassed unless it was deemed SBGT cannot restore and hold RB DP below 0 in.

Question 85 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	4
Difficulty:	3.00
System ID:	10318
User-Defined ID:	10318
Cross Reference Number:	
Topic:	85 - 295034 G.2.1.1
Num Field 1:	0.00
Num Field 2:	0.00
Text Field:	
Comments:	Objective: 29502LK050 References: DEOP 300-1, DAN 902(3)-3 A-3 & F-14 K/A: 295034 G.2.1.1 -- / 4.2 K/A: Knowledge of conduct of operation requirements: Secondary Containment Ventilation High Radiation. CFR: 41.10/43.10/45.13 PRA: Yes Safety Function: 9 Level: High Pedigree: Bank History: None **SRO Criteria: 10CFR55.43(b)(5)** - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. Explanation: A. Correct - Only the drywell and RPV water level isolations are allowed to be bypassed since they do not indicate a release hazard. Reactor building exhaust radiation above the isolation setpoint would be indicated of a potential radioactive release problem and would not be allowed to be bypassed unless it was deemed SBGT cannot restore and hold RB DP below 0 in. B. Incorrect - Plausible because the ventilation would have tripped, but it could be restarted without a valid Reactor Building exhaust radiation condition. C. Incorrect - Plausible because bypassing the isolation signals would be allowed and restart of fans without a valid Reactor Building exhaust radiation condition. D. Incorrect - Plausible because the ventilation would have tripped, but it could be restarted without a valid Reactor Building exhaust radiation condition. **REQUIRED REFERENCES:** None

86 **ID: 28077** **Points: 1.00**

Unit 2 was operating at rated power and then the 2B Recirc pump tripped resulting in the following conditions:

2A Recirc pump speed	30%
2B Recirc pump speed	0%
Active loop / reactor coolant temp	525°F
Idle loop temperature	498°F
RPV bottom head temperature	350°F

Which of the following describes restart conditions of the 2B Recirc pump?

A. All conditions are appropriate for restart.

B. A restart is NOT permitted due to 2A Recirc pump speed ONLY.

C. A restart is NOT permitted due to the difference between idle loop temperature AND active loop temperature.

D. A restart is NOT permitted due to the difference between active loop temperature AND RPV bottom head temperature.

Answer: D

Answer Explanation

DOP 0202-01 specifies the conditions necessary for restart of the idle Recirc pump. The temperature difference between the bottom head coolant and the reactor vessel coolant must be ≤ 145°F (SR 3.4.9.3). This requirement is NOT met. The temperature difference between the Recirc Loop coolant in the loop to be started and the reactor vessel coolant must be ≤ 50°F (SR 3.4.9.4). This requirement is met. Lastly, the operating Recirc pump speed (for U2) must be ≤ 30% (prerequisites of DOP 202-01). This requirement is met. So, of the conditions given, one criteria does NOT meet the restart requirements.

Question 86 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	5
Difficulty:	3.00
System ID:	28077
User-Defined ID:	28077
Cross Reference Number:	
Topic:	86 - 295001.A2.10
Num Field 1:	
Num Field 2:	
Text Field:	
Comments:	Objective: 20200LK004 References: DOP 202-01, TS 3.4.9 SR 3.4.9.3 and SR 3.4.9.4 K/A: 295001.A2.10 -- / 3.7 K/A: Ability to determine and/or interpret the following as they apply to Partial or Complete Loss of Forced Core Flow Circulation: Recirculation system/RPV differential temperatures. CFR: 41.10/43.5/45.13 Safety Function: 1 Level: High Pedigree: New History: N/A **SRO Criteria: 10CFR55.43(b)(2)** - Facility operating limitations in the technical specifications and their bases. Explanation: A. Incorrect - Plausible because the criteria for operating pump speed and temperature difference between the reactor coolant temperature in the recirculation loop to be started and the RPV coolant temperature is met. B. Incorrect - Plausible because must identify that the limit is < 30% for pump speed and temperature difference between the reactor coolant temperature in the recirculation loop to be started and the RPV coolant temperature is met. C. Incorrect - Plausible because must identify that the limit is < 30% for pump speed. Bottom head temperature will NOT permit restart. D. Correct - DOP 202-01 specifies the conditions necessary for restart of the idle Recirc pump. The temperature difference between the bottom head coolant and the reactor vessel coolant must be < 145°F (SR 3.4.9.3). This requirement is NOT met. The temperature difference between the Recirc Loop coolant in the loop to be started and the reactor vessel coolant must be < 50°F (SR 3.4.9.4). This requirement is met. Lastly, the operating Recirc pump speed (for U2) must be < 30% (prerequisites of DOP 202-01). This requirement is met. So, of the conditions given, one criteria does NOT meet the restart requirements. **Required reference:** None

87 **ID: 28078** **Points: 1.00**

The Reactor is in Cold Shutdown with the Reactor Vessel head still tensioned.

Normal Shutdown Cooling has been lost. Other means of shutdown cooling have been unsuccessful and it is decided to establish a cooling flow path through an SRV to the Torus.

What is the MINIMUM Technical Specification temperature for the Reactor Vessel metal temperatures for these conditions, AND what is this based upon?

A. 83°F, Shell to Flange T (at greatest stress)

B. 68°F, Shell to Flange T (at greatest stress)

C. 83°F, Nil Ductility Temperature + 60°F

D. 68°F, Nil Ductility Temperature + 60°F

Answer: C

Answer Explanation

Per T.S. Bases 3.4.9, when the water level is within the normal range for power operation and the pressure is less than 20% of the preservice system hydrostatic test pressure (for Dresden 2 and 3, this pressure is 312 psig). Under these conditions, the minimum temperature is 60°F above the RT_{NDT} of the closure flange regions which are stressed by the bolt preload (for Dresden 2 and 3, this temperature is 83°F).

Question 87 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	4
Difficulty:	4.00
System ID:	28078
User-Defined ID:	28078
Cross Reference Number:	
Topic:	87 - 295021.G2.2.23
Num Field 1:	
Num Field 2:	
Text Field:	
Comments:	Objective: DRE 205LN001-07 References: T.S. Bases 3.4.9 RCS Pressure and Temperature Limits T.S.3.4.9 Tables, and UFSAR section 5.3.2.1.1.2 K/A: 295021.G2.2.23 -- / 4.6 K/A: Ability to track technical specification limiting conditions for operation: Loss of Shutdown Cooling. CFR: 41.10/43.2/45.13 Safety Function: 4 Level: High Pedigree: Bank History: None **SRO Criteria: 10CFR55.43(b)(2)** - Facility operating limitations in the technical specifications and their bases. Explanations: A. Incorrect - Plausible because part 1 is correct, Part 2 is plausible because the reactor vessel head still tensioned. B. Incorrect - Plausible because the bottom head region limit is established as 68°F based on lowest moderator temperature assumptions for shutdown margin analysis. Part 2 is plausible because the reactor vessel head still tensioned. C. Correct - Per T.S. Bases 3.4.9, when the water level is within the normal range for power operation and the pressure is less than 20% of the preservice system hydrostatic test pressure (for Dresden 2 and 3, this pressure is 312 psig). Under these conditions, the minimum temperature is 60°F above the RT_{NDT} of the closure flange regions which are stressed by the bolt preload (for Dresden 2 and 3, this temperature is 83 F). D. Incorrect - Plausible because the bottom head region limit is established as 68°F based on lowest moderator temperature assumptions for shutdown margin analysis. Part 2 is correct. **Required References:** None

None

88	ID: 28080	Points: 1.00

Unit 2 was operating at near rated power, with the U2 EDG OOS for maintenance, and a transient occurred.

- TR-86 sudden pressure relay tripped
- RPV water level dropped to -70 inches
- The Unit 2/3 EDG failed to start (automatically and manually)

The Unit Supervisor should direct the NSO to enter ___(1)___, and direct repowering the Div 1 and Div 2 4KV buses using the 23-1 to 33-1 crosstie AND the ___(2)___.

A. (1) DGA-12, LOSS OF OFFSITE POWER, ONLY
(2) 24-1 to 34-1 crosstie

B. (1) DGA-12, LOSS OF OFFSITE POWER, ONLY
(2) U2 SBO

C. (1) DGA-12, LOSS OF OFFSITE POWER, THEN exit DGA-12 and enter DGA-22, STATION BLACKOUT
(2) 24-1 to 34-1 crosstie

D. (1) DGA-12, LOSS OF OFFSITE POWER, THEN exit DGA-12 and enter DGA-22, STATION BLACKOUT
(2) U2 SBO

Answer: B

Answer Explanation

TR-86 will de-energize upon actuation of the Sudden Pressure relay. This causes a loss of power to TR-22. From the conditions given, the reactor will SCRAM, TR-21 will lockout, and the 4KV Div 1 and Div 2 4KV buses will de-energize. The loss of TR-21 and TR-22, will cause a loss of offsite power to Unit 2. Having U2 EDG OOS, and failure of U2/3 EDG will result in loss of power to all 4KV Buses on U2. DGA-12 would be selected to restore power, and it directs use of the U2 SBO and one unit cross tie to restore power.

Question 88 Info	
Question Type:	Multiple Choice
Status:	Active
Points:	1.00
Time to Complete:	0
Difficulty:	3.00
System ID:	28080
User-Defined ID:	28080
Topic:	88 - 264000.A2.11
Comments:	Objective: DRE262LN003.12 Reference: DGA-12, DGA-22, DOA 6600-01 K/A: 264000.A2.11 -- / 4.3 K/A: Ability to (a) predict the impacts of the following on Emergency Generator and (b) based on those prediction, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Failure of emergency generator to start/load CFR: 41.5/ 43.5 / 45.6 Safety Function: 6 Level: High Pedigree: Bank History: None **SRO Criteria: 10CFR55.43(b)(5)** - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. Explanation: A. Incorrect – Item (1) is correct. Item (2) is incorrect, as the U2 SBO is used for these conditions, along with one crosstie. Plausibility: (1) Item 1 is the correct procedure. (2) A related procedure, DOA 6600-01, contains steps for both crossties, however the candidate must realize that DGA-12 requires that only one crosstie be used. B. Correct – TR-86 will de-energize upon actuation of the Sudden Pressure relay. This causes a loss of power to TR-22. From the conditions given, the reactor will SCRAM, TR-21 will lockout, and the U2/3 EDG will be given a start signal. The loss of TR-21 and TR-22, will cause a loss of offsite power to Unit 2. Having U2 EDG OOS, and failure of U2/3 EDG will result in loss of power to all 4KV Buses on U2. DGA-12 would be selected to restore power, and it directs use of the U2 SBO and one unit crosstie to restore power. C. Incorrect – Item (1) is incorrect. With a unit crosstie available, DGA-22 is not entered for these conditions. Item (2) is incorrect. The power sources that should be used to repower these buses, per DGA-12, are the SBO and a single unit cross tie. Plausibility: (1) The candidate may not recognize that the crossties are still available, which would lead them to enter DGA-22 . (2) A related procedure, DOA 6600-01, contains steps for both crossties, however the candidate must realize that DGA-12 requires that only one crosstie is required to be used. D. Incorrect – Item 1 is Incorrect. With a unit cross tie available, DGA-22 is not entered for these conditions. (2) Item 2 is correct. Plausibility: (1) DGA-12 is the right procedure to enter. (2) A related procedure, DOA 6600-01, contains steps for both crossties, however the candidate must realize that DGA-12 requires that only one crosstie be used. **REQUIRED REFERENCES:** None

89 **ID: 10386** **Points: 1.00**

During the U2 Refuel Outage EMD replaced the Safety related 250 VDC Battery and performed all required PMTs and surveillances. The battery has been turned over to Operations.

Unit 2 is in MODE 3 with ALL battery chargers operable and the 250 VDC batteries have now been placed on a float charge.

Safety related 250 VDC pilot cell weekly readings were completed with the following results:

• Voltage	2.23 volts
• Specific Gravity	1.197 (corrected)
• Electrolyte Level	at the maximum mark
• Battery charging current	1.9 amps

Which of the following actions describes the required action, if any, regarding battery operability?

(Reference provided)

A. NO actions are required. ALL parameters meet requirements for battery operability.

B. Perform necessary surveillances within 2 hours and restore to operable status within 24 hours.

C. The battery must be declared inoperable immediately and restored to operable status within 24 hours.

D. ALL Category C measurements must be taken within 24 hours. If any of these Category C readings are less than the allowable values the battery must be declared inoperable immediately.

Answer: D

Answer Explanation

TRM Table 3.8.b-1 lists the requirements for float voltage on battery cells. With the pilot cell reading less than the Category A requirement for float voltage, TRM 3.8.6 Condition A actions must be taken. The action requires that the Category C measurements be taken within 24 hours. If any of the Category C readings are less than the allowable values the battery must be declared inoperable immediately in accordance with Tech Spec 3.8.6 Condition B.

Question 89 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	5
Difficulty:	3.00
System ID:	10386
User-Defined ID:	10386
Cross Reference Number:	
Topic:	89 - 263000 G.2.2.21
Num Field 1:	0.00
Num Field 2:	0.00
Text Field:	
Comments:	Objective: 263LN001-7.b References: Tech Spec 3.8.6 , TRM table T3.8.b-1 K/A: 263000 G.2.2.21 -- / 4.1 K/A: Knowledge of pre - and post - maintenance operability requirements. DC Electrical Distribution CFR: 41.10/43.2 Safety Function: 6 Level: High Pedigree: Bank History: None **SRO Criteria: 10CFR55.43(b)(2)** - Facility operating limitations in the technical specifications and their bases. Explanation: A. Incorrect - The specific gravity reading is less than the allowable limit & Tech Spec Table 3.8.6-1 footnote (c) **DOES NOT** apply. Plausible because all other criteria are met and there are times when it would be allowable for specific gravity to be less than 1.200 B. Incorrect - Plausible because this would be correct if the float voltage were <2.07 V. C. Incorrect - Plausible because this would be correct for One 250 VDC or 125 VDC battery with one or more battery cells float voltage < 2.07 V and float current > 2 amps. D. Correct - TRM Table 3.8.b-1 lists the requirements for float voltage on battery cells. With the pilot cell reading less than the Category A requirement for float voltage, TRM 3.8.6 Condition A actions must be taken. The action requires that the Category C measurements be taken within 24 hours. If any of the Category C readings are less than the allowable values, the battery must be declared inoperable immediately in accordance with Tech Spec 3.8.6 Condition B. **Required References:** TRM 3.8.b, T.S. 3.8.6 with 1 hour or less blanked out for each

90 **ID: 28082** **Points: 1.00**

Unit 2 is operating at rated power and Unit 3 is in Day 3 of a refueling outage.

- U3 SAC is OOS
- 2B IAC is OOS
- 2A and 3C IACs are running supplying Unit 2
- 3A and 3B IACs are running supplying Unit 3

A transient occurs resulting in the following:

- 10:05 Unit 2 IA header pressure begins lowering
- 10:10 Annunciator 923-1 E-4, 2 INST AIR DRYER TROUBLE, alarms
- 10:20 902-6 H-10, FW REG VLVS BACKUP AIR ACTIVE alarm is received

The 2A IAC Dryer Bypass ___(1)___ AND the SRO will direct ___(2)___.

A. (1) will auto open
(2) Start all available SERVICE AIR compressors, per DOA 4600-01 Service Air System Failure

B. (1) must be manually opened
(2) Start all available SERVICE AIR compressors, per DOA 4600-01 Service Air System Failure

C. (1) will auto open
(2) Crosstie Unit 2 and Unit 3 INSTRUMENT AIR systems, per DOA 4700-01 Instrument Air System Failure

D. (1) must be manually opened
(2) Crosstie Unit 2 and Unit 3 INSTRUMENT AIR system, per DOA 4700-01, Instrument Air System Failure

Answer: C

Answer Explanation

The 2A IAC Dryer alarm will come in at 60 psig downstream of the dryer. The bypass valve will auto open sensing a dryer issue. Given the time from the beginning of the leak to the alarm, the candidate must identify IA header pressure is dropping at approximately 1 psig per minute. Direction to cross tie U2 and U3 IA headers per DOP 4700-03 is appropriate

Question 90 Info	
Question Type:	Multiple Choice
Status:	Active
Points:	1.00
Time to Complete:	3
Difficulty:	2.00
System ID:	28082
User-Defined ID:	8082
Topic:	90 - 300000.A2.01
Comments:	Objective: DRE278LN001.08 Reference: DOA 4700-01, DOP 4700-03, DAN 902(3)-6 H-10, DAN 923-1 E-4 K/A: 300000.A2.01 / 3.3 K/A: Ability to (a) predict the impacts of the following on the Instrument Air System and (b) base on those prediction, use procedures to correct, control, or mitigate the consequences of those abnormal operation: Air dryer and filter malfunctions. CFR: 41.5/45.6 Safety Function: 8 Level: High Pedigree: New History: N/A **SRO Only Criteria: 10CFR55.43(b)(5) -** Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. Explanation: A. Incorrect - Plausible because the dryer bypass vlv will auto open at 60 psig. There are multiple IA compressors (5 total). Only 2 SA compressors (1 on each unit). Given in the stem Unit 3 SAC is OOS (Service Air is no longer unit specific when in a normal lineup. Normal lineup is 2/3 SA crosstie open, 1 SAC running and the other in PTL), U2 SAC is running and the SA-IA crosstie is already open based on alarms given. Unit 2 SAC is unable to keep up with SA loads and IA loads/leakage. B. Incorrect - Plausible because if pressure continues being reduced the Dryer must be manually isolated. There are multiple IA compressors (5 total). Only 2 SA compressors (1 on each unit). Given in the stem Unit 3 SAC is OOS (Service Air is no longer unit specific when in a normal lineup. Normal lineup is 2/3 SA crosstie open, 1 SAC running and the other in PTL), U2 SAC is running and the SA-IA crosstie is already open based on alarms given. Unit 2 SAC is unable to keep up with SA loads and IA loads/leakage. C. Correct - The 2A IAC Dryer alarm will come in at 60 psig downstream of the dryer. The bypass valve will auto open sensing a dryer issue. Given the time from the beginning of the leak to the alarm, the candidate must identify IA header pressure is dropping at approximately 1 psig per minute. Direction to cross tie U2 and U3 IA headers per DOP 4700-03 is appropriate D. Incorrect - Plausible because if pressure continues being reduced the Dryer must be manually isolated. Part 2 is correct. **REQUIRED REFERENCES:** None

None

91 **ID: 28083** **Points: 1.00**

Chemistry has reported that high coolant activity exists on Unit 2 and a fuel element failure is suspected.

The Unit Supervisor directs entry into DGA-16, COOLANT HIGH ACTIVITY - FUEL ELEMENT FAILURE.

Which of the following actions is required to prevent excessive personnel exposure if site assembly is required?

A. Isolating HPCI steam flow

B. Re-aligning HPCI Steam Drains

C. Isolating the Isolation Condenser

D. Re-aligning Recirc Sample Lines

Answer: B

Answer Explanation

Conservatively the Assembly area inside the RPA is near the feedpumps, which is against the condenser shield wall. Any flow of radioactive water to the condenser would increase dose rates in this area, so re-aligning HPCI steam drains is correct. HPCI is not isolated because it may be needed if a SCRAM is required.

Question 91 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28083
User-Defined ID:	28083
Cross Reference Number:	
Topic:	91 - 206002.G.2.1.39
Num Field 1:	
Num Field 2:	
Text Field:	
Comments:	Objective: 29501LK051 Reference: DGA-16 K/A: 206000.G.2.1.39 -- / 4.3 K/A: Knowledge of conservative decision-making practices: High-Pressure Coolant Injection. CFR: 41.10 / 43.5 / 45.12 PRA: No Safety Function: 2 Level: High Pedigree: Bank History: None **SRO Criteria: 10CFR55.43(b)(4)** - Radiations hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions. Explanation: A. Incorrect - Plausible because isolating HPCI steam flow would isolate the leakage, but this would not be a conservative decision. B. Correct - Conservatively the Assembly area inside the RPA is near the feedpumps, which is against the condenser shield wall. Any flow of radioactive water to the condenser would increase dose rates in this area, so re-aligning HPCI steam drains is correct. HPCI is not isolated because it may be needed if a SCRAM is required. C. Incorrect - Plausible because Isol Condenser could also be affected by high coolant activity, but does not drain to the main condenser. D. Incorrect - Plausible because Recirc sample lines would also be affected by high coolant activity, but does not drain to the main condenser. **Required References:** None

None

92 **ID: 28084** **Points: 1.00**

Unit 3 is in Mode 1 and the following conditions exist:

- An Operator is withdrawing control rod J-8 for a Unit power ascension
- Annunciators 903-5 A-3, ROD DRIFT, and B-3, ROD WORTH MIN BLOCK alarm
- The Operator notices there is NO position indication for rod J-8 on the Full Core Display, the Rod Worth Minimizer, or the 4 Rod Display
- Reactor power is steady

Given the above conditions:

The LCO for Tech Spec 3.1.3, Control Rod Operability ___(1)___ being met.

The Unit Supervisor directs ___(2)___.

A. (1) IS
(2) Enter DOA 0300-06, RPIS FAILURE, and enter a substitute position then move the control rod to a position that has a good RPIS indication.

B. (1) IS NOT
(2) Enter DOA 0300-06, RPIS FAILURE, and enter a substitute position then move the control rod to a position that has a good RPIS indication.

C. (1) IS
(2) Enter DOA 0300-05, INOPERABLE OR FAILED CONTROL ROD DRIVE, and insert the CRD to 00.

D. (1) IS NOT
(2) Enter DOA 0300-05, INOPERABLE OR FAILED CONTROL ROD DRIVE, and insert the CRD to 00.

Answer: B

Answer Explanation

Per TS 3.1.3 bases when position indication is lost for a control rod, it is considered inoperable and therefore does NOT meet the LCO for Control Rod Operability. The correct action is to enter DOA 0300-06 and enter a substitute position.

Question 92 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	2.00
System ID:	28084
User-Defined ID:	28084
Cross Reference Number:	
Topic:	92 - 214000.A2.01
Num Field 1:	
Num Field 2:	
Text Field:	
Comments:	Objective: 201LN002.08 Reference: DOA 0300-06 and TS 3.1.3 bases K/A: 214000.A2.01 -- / 3.3 K/A: Ability to (a) predict the impacts of the following on the Rod Position Information System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Failed reed switches CFR: 41.5/43.5/45.6 Safety Function: 7 Level: High Pedigree: New History: N/A **SRO Only Criteria: 10CFR55.43(b)(5) -** Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. Explanation: A. Incorrect - Plausible because the rod is not moving as indicated by power steady. If it was at 00 it would be met. Part 2 is correct. B. Correct - Per TS 3.1.3 bases when position indication is lost for a control rod, it is considered inoperable and therefore does NOT meet the LCO for Control Rod Operability. The correct action is to enter DOA 0300-06 and enter a substitute position. C. Incorrect - Plausible because the rod is not moving as indicated by power steady. Part 2 is plausible because the rod is INOP and if it failed to latch the correct action would be to Insert to 00. D. Incorrect - Plausible because part 1 is correct. Part 2 is plausible because the rod is INOP and if it failed to latch the correct action would be to Insert to 00. **Required references:** None

None

93	**ID: 13777**	**Points: 1.00**

The bases for the safety limit that requires reactor pressure vessel water level to be above the top of active irradiated fuel during shutdown conditions is to .....

A. provide adequate decay heat removal capability.

B. ensure that the NPSH requirements to the recirculation pumps are met.

C. ensure that the NPSH requirements to the shutdown cooling pumps are met.

D. ensure adequate radiation shielding to protect personnel performing local operations required by the DEOPs.

Answer: A

Answer Explanation

Per the basis of TS 2.0, with fuel in the reactor vessel during periods when the reactor is shut down, water level is maintained above active irradiate fuel to provide core cooling capability due to decay heat.

Question 93 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	o
Authorized for practice?	No
Points:	1.00
Time to Complete:	0
Difficulty:	2.00
System ID:	3777
User-Defined ID:	13777
Cross Reference Number:	
Topic:	93 - Generic 2.2.25 (1)
Num Field 1:	0.00
Num Field 2:	0.00
Text Field:	
Comments:	Objective: DRE202LN001.07 Reference: Tech Spec and Bases 2.0 K/A: Generic 2.2.25 -- / 4.2 K/A: Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits. CFR: 41.5 / 41.7 / 43.2 PRA: No Level: Memory Pedigree: Bank History: None **SRO Criteria: 10CFR55.43(b)(2)** - Facility operating limitations in the technical specifications and their bases. Explanation: A. Correct - Per the basis of TS 2.0, with fuel in the reactor vessel during periods when the reactor is shut down, consideration must be given to water level requirements due to the effect of decay heat. B. Incorrect - The answer is adequate decay heat removal capability. Plausible because the water in the RPV is what provides the NPSH for the Recirc Pumps, but is not the purpose for maintaining water level above TAF. C. Incorrect - The answer is adequate decay heat removal capability. Plausible because the water in the RPV is what provides the NPSH for the SDC pumps when they are aligned to the RPV, but is not he purpose for maintaining water level above TAF. D. Incorrect - The answer is adequate decay heat removal capability. Plausible because this is part of the definition of minimum safe operating level in the fuel pool, which also establishes a minimum level above irradiated fuel. **REQUIRED REFERENCES:** None

94 **ID: 27751** **Points: 1.00**

Unit 2 was operating at 70% power, with a power increase in progress, when Chemistry notified the Control Room of a significant increase in Iodine level in the Reactor coolant sample.

Which of the following actions is the Unit Supervisor required to direct?

A. Verify the Mechanical Vacuum pump is tripped.

B. Reduce power to keep activity level below the monitor's trip point.

C. Stop any power changes until the iodine concentration stabilizes, then continue the power ascension.

D. Stop any power changes until determined that the increase in iodine concentration is NOT from fuel failure, then continue the power ascension.

Answer: D

Answer Explanation

Power should not be increased until it has been determined that failed fuel is NOT the cause of the increase.

Question 94 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	27751
User-Defined ID:	27751
Cross Reference Number:	
Topic:	94 - Generic.2.1.37
Comments:	Objective: 29501LK050 Reference: DGA-16 K/A: Generic.2.1.37 4.3 / 4.6 K/A: Knowledge of procedures, guidelines, or limitations associated with reactivity management. CFR: 43.6 PRA: No Safety Function: 9 Level: Memory Pedigree: Bank History: 20-1 NRC Exam **SRO Only Criteria: 10CFR55.43(b)(5) -** Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. **SRO Justification:** Per ES-401, Attachment 2, section II.E, 10CFR55.43(b)(5) includes the selection of a procedure or **section** of a procedure to “mitigate or recover or which to proceed”. In the associated question, the Unit Supervisor must identify the actions needed in order to mitigate the significant increase in iodine level in the reactor coolant. Explanation: A. Incorrect - Verifying the Mechanical Vacuum pump is tripped is NOT required unless MSL radiation is > 3000 mR/hr. Plausible because this would be a correct action if the increased activity caused a steam line high rad. B. Incorrect - Reduce power to keep activity level below the monitors trip point is NOT required unless MSL or Offgas high radiation alarms annunciate. Plausible because this is a correct action to reduce power with recirc and rods if above MSL or OFF GAS hi rad alarms. C. Incorrect - If Iodine concentration significantly spikes the cause must be determined prior to restarting the power changes. Plausible because if the Off Gas system will reset then the action is to hold at power level until further instructions are received from the US. D. Correct - Power should not be increased until it has been determined that failed fuel is NOT the cause of the increase. **REQUIRED REFERENCES:** None

None

95 **ID: 28087** **Points: 1.00**

Reactor refueling operations are in progress and fuel assembly is being placed in the fuel storage racks when the following annunciators alarm on the 902-3 panel:

REFUEL FLOOR HI RADIATION	B-1
RX BLDG VENT CH A OR CH B HIGH RADIATION	B-16
RX BLDG FUEL POOL CH A HIGH RADIATION	C-16
RX BLDG FUEL POOL CH B HIGH RADIATION	E-16
RX BLDG VENT CHANNEL A HI HI RADIATION	F-14

If all systems operate as designed and Refuel Floor Radiation monitor 2(3)1700-16A reading of 15,000 mR/hr is confirmed, what is the emergency classification level for this event?

(Reference provided)

A. Unusual Event

B. Alert

C. Site Emergency

D. General Emergency

Answer: B

Answer Explanation

Damage to irradiated fuel resulting in a release of radioactivity from the fuel as indicated by ANY Table R1 Radiation Monitor reading >1000 mRem/hr.

Question 95 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	5
Difficulty:	2.00
Topic:	95 - 295033.A2.04
Comments:	Objective: 29501LP032 References: EP-AA-1004 Addendum 3, DANs 902-3 B-1, B-16, C-16, E-16, F-14 K/A: 295033.A2.04 -- / 4.3 K/A: Ability to determine and/or interpret the following as they apply to High Secondary Containment Area Radiation Levels: Emergency plan. CFR: 41.10/43.5/45.13 PRA: No Safety Function: 9 Level: High Pedigree: New History: N/A **SRO Criteria: 10CFR55.43(b)(4)** - Radiations hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions. Explanation: A. Incorrect - Plausible because RU2 states UNPLANNED Area Radiation Monitor reading rise on ANY radiation monitors in Table R1. Refuel Floor High Range ARM Station #2(4), Fuel Pool Radiation Monitor B. Correct - Damage to irradiated fuel resulting in a release of radioactivity from the fuel as indicated by ANY Table R1 Radiation Monitor reading >1000 mRem/hr. C. Incorrect - Plausible because CS6 states RPV level cannot be determined for > 30 minutes. AND core uncovery is indicated by ANY of the following: Table C3 indications of a sufficient magnitude to indicate core uncovery. OR Refuel Floor Hi Range ARM >3000 mR/hr. D. Incorrect - Plausible because CG6 states RPV level cannot be determined for > 30 minutes. AND core uncovery is indicated by ANY of the following: Table C3 indications of a sufficient magnitude to indicate core uncovery. OR Refuel Floor Hi Range ARM >3000 mR/hr. AND ANY Containment Challenge Indication (Table C4) **Required reference:** EP-AA-1004 Addendum 3 Hot and Cold Matrices

None

96 **ID: 28091** **Points: 1.00**

Unit 2 and Unit 3 were at 100% power when the control room had to be abandoned.

Before leaving the MCR, the U2 NSO reported that 2-1301-1, RX OUTLET ISOL, indicates CLOSED.

The Unit Supervisor will DIRECT an operator to re-open valve 2-1301-1, RX OUTLET ISOL, in accordance with ___(1)___.

Once the Isolation Condenser has been initiated, makeup to the isolation condenser shell side MUST be started within ___(2)___ minutes.

A. (1) TSG-3, OPERATIONAL CONTINGENCY ACTION GUIDELINES
(2) 10

B. (1) TSG-3, OPERATIONAL CONTINGENCY ACTION GUIDELINES
(2) 20

C. (1) DSSP 0100-CR, HOT SHUTDOWN PROCEDURE – CONTROL ROOM EVACUATION
(2) 10

D. (1) DSSP 0100-CR, HOT SHUTDOWN PROCEDURE – CONTROL ROOM EVACUATION
(2) 20

Answer: D

Answer Explanation

The correct procedure is DSSP 0100-CR. The DSSP contains actions to restore this valve, and the actions must be followed as written in order to meet the required actions and time lines needed for fire safe shutdown. Although TSG-3 has similar actions, it is a support procedure that is not required to be entered, and which is used to support the emergency response organization for beyond design basis accident conditions not specifically addressed in operating procedures.

Per DSSP 0100-CR, isolation condenser makeup must be initiated within 20 minutes of initiating the isolation condenser.

Question 96 Info	
Question Type:	Multiple Choice
Status:	Active
Points:	1.00
Time to Complete:	3
Difficulty:	2.00
System ID:	28091
User-Defined ID:	28091
Topic:	96 - 295016 G.2.4.5
Comments:	Objective: DRE277LN001.05 Reference: DSSP 0100-CR K/A: 295016 G.2.4.5 -- / 4.3 K/A: Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions: Control Room Abandonment. CFR: 43.5 PRA: No Safety Function: 7 Level: Memory Pedigree: Bank History: None **SRO Only Criteria: 10CFR55.43(b)(5) -** Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. Explanation: A. Incorrect - (1) The correct procedure is DSSP 0100-CR (2) the required time is 20 minutes. Plausible because (1) TSG-3 has similar actions for reopening 2-1301-1. (2) For control room abandonment, DSSP 0100-CR is entered. This procedure has other actions that must be completed within 10 minutes. B. Incorrect - (1) The correct procedure is DSSP 0100-CR (2) the second part of the answer is correct. Plausible because (1) TSG-3 has similar actions for reopening 2-1301-1. (2) the second part of the answer is correct. C. Incorrect - (1) The first part of the answer is correct. (2) the required time is 20 minutes. Plausible because (1) The first part of the answer is correct (2) For control room abandonment, DSSP 0100-CR is entered. This procedure has other actions that must be completed within 10 minutes. D. Correct - (1) The correct procedure is DSSP 0100-CR. The DSSP contains actions to restore this valve, and the actions must be followed as written in order to meet the required actions and time lines needed for fire safe shutdown. Although TSG-3 has similar actions, it is a support procedure that is not required to be entered, and which is used to support the emergency response organization for beyond design basis accident conditions not specifically addressed in operating procedures. (2) Per DSSP 0100-CR, isolation condenser makeup must be initiated within 20 minutes of initiating the isolation condenser. **K/A Justification:** DOP 1300-03 MANUAL OPERATION OF THE ISOLATION CONDENSER TSG-3 Att C MANUAL OPERATION OF THE UNIT 2 ISOLATION CONDENSER DSSP 100-CR HOT SHUTDOWN PROCEDURE-CONTROL ROOM EVACUATION All 3 levels of procedures have the steps outlined to perform the actions required for the Iso Condenser. Must understand the organization and hierarchy of procedures to be used for Control Room Evacuation. **Required References:** None

97	**ID: 28094**	**Points: 1.00**

Unit 2 was at full power when a LOCA occurred:

- A release is in progress
- The SAMG's have NOT been entered
- Torus Bottom pressure is 45 psig and slowly rising
- Field Survey teams have reported the following gamma dose rates, which are expected to remain at this level for the next 90 minutes:
  - ♦ 8 mRem/hr at the 345 KV switchyard
  - ♦ 12 mRem/hr at the Lift Station
  - ♦ 15 mRem/hr at the Training Building parking lot
  - ♦ 18 mRem/hr at the Pre-Access Facility
- The Shift Manager has determined that primary containment pressure reduction is REQUIRED in order to REDUCE THE EXPECTED OFFSITE DOSE, per the override in DEOP 0200-01, PRIMARY CONTAINMENT CONTROL.

Based on the CURRENT conditions, the Unit Supervisor should direct ENTERING DEOP 0500-04, CONTAINMENT VENTING ___(1)___.

Per the guidance in OP-AA-103-102-1002, STRATEGIES FOR SUCCESSFUL TRANSIENT MITIGATION, venting containment to REDUCE TOTAL OFFSITE DOSE containment pressure should be lowered to ___(2)___ psig.

(Reference provided)

A. (1) ONLY
(2) 0

B. (1) ONLY
(2) NO lower than 10

C. (1) AND DEOP 0300-02, RADIOACTIVITY RELEASE CONTROL
(2) 0

D. (1) AND DEOP 0300-02, RADIOACTIVITY RELEASE CONTROL
(2) NO lower than 10

Answer: D

Answer Explanation

Of the areas listed, only the lift station is outside of the site-boundary (off-site). It has an expected dose above 10 mRem/hr, based on Field Team reports, and is expected to last for more than 60 minutes. Therefore, it would meet the EAL ALERT condition for RA1, and entry into DEOP 0300-02, Radioactivity control is required. OP-DR-103-102-1002, STRATEGIES FOR SUCCESSFUL TRANSIENT MITIGATION, requires venting no lower than approximately 10 psig when venting to reduce total offsite dose per the override in DEOP 0200-01. This is done to ensure adequate NPSH for ECCS when in an accident condition.

Question 97 Info

Comments:

Objective: 29502LK103

Reference: EP-AA-1000, ODCM, DEOP 300-2, EP-AA-1004 Addendum 3, DEOP 0500-04, OP-DR-103-102-1002

K/A: 295038 G.2.4.20 -- / 4.3

K/A: High Offsite Radioactivity Release Rate - Knowledge of the operational implications of emergency and abnormal operating procedures warnings, cautions, and notes.

CFR: 41.10 / 43.5 / 45.13

Safety Function: 9

PRA: No

Level: High

Pedigree: Bank

History: NRC 19-1

SRO Only Criteria: 10CFR55.43(b)(5) – Assessment of facility conditions and selection of appropriate procedures during normal, abnormal and emergency conditions. **10CFR55.43(b)(4) –** Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.

Explanation:

A. Incorrect - (1) Of the areas listed, only the lift station is outside of the site-boundary (off-site). It has an expected dose above 10 mRem/hr, based on Field Team reports, and is expected to last for more than 60 minutes. Therefore, it would meet the EAL ALERT condition for RA1, and entry into DEOP 0300-02, Radioactivity control is required. (2) OP-DR-103-102-1002requires venting to no lower than approximately 10 psig when venting to reduce total offsite dose per the override in DEOP 0200-01. This is done to ensure adequate NPSH for ECCS when in an accident condition. Plausible because (1) Of the areas listed, only the lift station is OFFSITE. The students may believe that all the areas are onsite, which is a common misconception. (2) When venting in DEOP 0500-04, Attachment 4 to control H_2 in the drywell, pressure is intentionally reduced all the way to zero psig. Additionally, DEOP 0200-01 gives guidance to stop drywell sprays and torus sprays before reaching 0 psig.

B. Incorrect - (1) Of the areas listed, only the lift station is outside of the site-boundary (off-site). It has an expected dose above 10 mRem/hr, based on Field Team reports, and is expected to last for more than 60 minutes.. Therefore, it would meet the EAL ALERT condition for RA1, and entry into DEOP 0300-02, Radioactivity control is required. (2) The second part of the answer is correct.
Plausible because (1) Of the areas listed, only the lift station is OFFSITE. The students may believe that all the areas are onsite, which is a common misconception. (2) The second part of the answer is correct.

C. Incorrect - (1) The first part of the answer is correct (2) OP-DR-103-102-1002 requires venting to no lower than approximately 10 psig when venting to reduce total offsite dose per the override in DEOP 0200-01. This is done to ensure adequate NPSH for ECCS when in an accident condition. Plausible because(1) The first part of the answer is correct (2) When venting in DEOP 0500-04, Attachment 4 to control H_2 in the drywell, pressure is intentionally reduced all the way to zero psig. Additionally, DEOP 0200-01 gives guidance to stop drywell sprays and torus sprays before reaching 0 psig.

D. Correct - (1) Of the areas listed, only the lift station is outside of the site-boundary (off-site). It has an expected dose above 10 mRem/hr, based on Field Team reports, and is expected to last for more than 60 minutes. Therefore, it would meet the EAL ALERT condition for RA1, and entry into DEOP 0300-02, Radioactivity control is required. (2) OP-DR-103-102-1002, STRATEGIES FOR SUCCESSFUL TRANSIENT MITIGATION, requires venting no lower than approximately 10 psig when venting to reduce total offsite dose per the override in DEOP 0200-01. This is done to ensure adequate NPSH for ECCS when in an accident condition.

Required References: EP-AA-1004 Addendum 3 Hot and Cold Matrices and ODCM Figure 1-2

K/A Justification: Per DEOP 0010-00, GUIDELINES FOR USE OF DRESDEN EMERGENCY OPERATING PROCEDURES AND SEVERE ACCIDENT MANAGEMENT GUIDELINES, Pointers are used to highlight system operating details which may apply depending on existing conditions (notes).

98 **ID: 22032** **Points: 1.00**

Unit 2 is operating at 100% power.

- 2B SAC is being started but has not been placed on the header.
- An EO reports that the 2B IAC is NOT loading.
- U2 IA Pressure demand in the normal band.
- A troubleshooting plan is being developed.

A non-licensed Field Sup has developed a simple Troubleshooting plan per MA-AA-716-004, CONDUCT OF TROUBLESHOOTING.

What is the MINIMUM level of permission required for this troubleshooting plan before work can commence?

A. Non-Licensed Field Supervisor

B. Unit Supervisor

C. Shift Manager

D. Operations Support and Services Manager

Answer: B

Answer Explanation

Per MA-AA-716-004, conduct of troubleshooting, the Unit Supervisor Authorizes field troubleshooting activities and ensures adequate bounds have been established to limit plant impact and/or cause a change from previous risk assessment values by review and approval of each troubleshooting activity.

Question 98 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	2.00
System ID:	22032
User-Defined ID:	22032
Cross Reference Number:	
Topic:	98 - Generic 2.2.20
Num Field 1:	
Num Field 2:	
Text Field:	
Comments:	Objective: 262LN005.08 References: MA-AA-716-004 K/A: Generic 2.2.20 3.8 K/A: Knowledge of the process for managing troubleshooting activities. CFR: 41.10/43.5/45.13 PRA: No Safety Function: N/A Level: Memory Pedigree: New History: N/A **SRO Only Criteria: 10CFR55.43(b)(5) –** Assessment of facility conditions and selection of appropriate procedures during normal, abnormal and emergency conditions. Explanation: A. Incorrect - Plausible because the Field Supervisor ensures a pre-job brief commensurate with the complexity and risk of each troubleshooting activity is performed and includes all work groups whose expertise is needed to implement and evaluate the results of the activity. B. Correct - Per MA-AA-716-004, conduct of troubleshooting, the Unit Supervisor Authorizes field troubleshooting activities and ensures adequate bounds have been established to limit plant impact and/or cause a change from previous risk assessment values by review and approval of each troubleshooting activity. C. Incorrect - Plausible because SM evaluates emergent troubleshooting activities and associated risks relative to applicable equipment problems in accordance with WC-AA-2000, Emergent Issue Response procedure. D. Incorrect - Plausible because Senior Manager of Operations Support and Services (or designee) — Has final Operational, Elevated, Conditionally Critical and Reactivity Risk determination authority. - Reviews the schedule at E-6 to determine if all work tasks requiring risk evaluation were properly identified and assessed. **Required references:** None

99 **ID: 28097** **Points: 1.00**

Unit 2 is starting up after a refuel outage.

- Rods are being pulled to raise power per DGP 01-01, UNIT STARTUP
- Currently 3 bypass valves are open
- A 25°F/hour Heatup Rate has been established
- Control Rod F-6 is being moved
- RBM 7 fails UPSCALE

What action, in any, must be taken?

(Reference provided)

A. Bypass RBM

B. No action required

C. Restore RBM monitor channel to operable status with 24 hours

D. Restore RBM monitor channel to operable status with 30 hours

Answer: B

Answer Explanation

ith power less than 30% as indicated by 3 bypass valves open (~12% pwr), the RBM is not required per Tech Spec Table 3.3.2.1-1. Therefore, no action required.

Question 99 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	4
Difficulty:	2.00
System ID:	28097
User-Defined ID:	28097
Cross Reference Number:	
Topic:	99 - 215002 G.2.2.22
Num Field 1:	
Num Field 2:	
Text Field:	
Comments:	Objective: DRE215LN002-07 Reference: Tech Spec. 3.3.2.1, Table 3.3.2.1-1, DAN 902(3)-5 A-7 K/A: 215002 G.2.2.22 4.7 K/A: Knowledge of limiting conditions for operation and safety limits: Rod Block Monitor. Safety Function: 7 CFR: 41.5.43.2/45.2 PRA: No Level: High Pedigree: New History: N/A **SRO Criteria: 10CFR55.43(b)(2)** - Facility operating limitations in the technical specifications and their bases. Explanation: A. Incorrect - Plausible because although power is less than 30%, and RBM is not required by Tech Specs, the candidate may assume that the rod block still physically occurs, and must be manually bypassed (it is automatically bypassed by the RBM). B. Correct - With power less than 30% as indicated by 3 bypass valves open (~12% power), the RBM is not required per Tech Spec Table 3.3.2.1-1. Therefore, no action required. C. Incorrect - Plausible because this would be the correct answer for 1 channel Hi/INOP and power greater than 30%. D. Incorrect - Plausible because the TS delaying entry into the associated conditions and required actions for up to 6 hours under certain circumstances for required surveillances. If the candidate adds this 6 hour delay to the required 24 hours, this would appear to be the correct answer for 1 channel Hi/INOP and power greater than 30%. **Required References:** TS 3.3.2.1 with 1 hour or less blanked out

None

100	**ID: 28098**	**Points: 1.00**

A transient occurred resulting in the following RAD readings on the the 2/3 Reactor Bldg and Unit 2/3 Chimney SPINGS for the last 15 minutes:

Unit 2/3 Chimney SPING reads 1.8 E+09 uCi/sec.
Unit 2/3 Rx Bldg SPING reads 8.0 E+08 uCi/sec.

- You are the Shift Manager required to make the EAL call and Protective Action Recommendation (PARs), as needed
- Wind Direction is from 58°
- A loss of primary containment has occurred.

(1) What is the initial EAL classification?

(2) What is the initial Protective Action Recommendation, if any?

(Reference provided)

A. (1) Site Area Emergency
(2) No PARs required

B. (1) General Emergency
(2) Shelter Sub Areas 1, 3, 4, 7 ONLY

C. (1) General Emergency
(2) Evacuate Sub Areas: 1, 3, 4, 7 ONLY

D. (1) General Emergency
(2) Evacuate Sub Areas 1, 2, 3, 4, 5, 7, 8, 10, 11 ONLY

Answer: D

Answer Explanation

The sum of reading on the Unit 2/3 Rx Bldg and Unit 2/3 Chimney SPINGs exceeds the 2.05 E+09 uCi/sec for greater than or equal to 15 minutes meets the threshold of RG1. Per the PARs flowchart, Evacuation should be recommended and based on wind direction the correct areas are 1, 2, 3, 4, 5, 7, 8, 10, 11

Question 100 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	4
Difficulty:	2.00
System ID:	28098
User-Defined ID:	28098
Cross Reference Number:	
Topic:	100 - 295017.A2.02
Num Field 1:	
Num Field 2:	
Text Field:	
Comments:	Objective: 295LP032 Reference: EP-AA-111-F-04 K/A: 295017.A2.02 -- / 3.3 K/A: Ability to determine and/or interpret the following as they apply to High Offsite Radioactive Release Rate: Total number of curies released or release rate/duration. CFR: 41.10/43.5/45.13 Safety Function: 5 Level: High Pedigree: New History: N/A **SRO Only Criteria: 10CFR55.43(b)(5) –** Assessment of facility conditions and selection of appropriate procedures during normal, abnormal and emergency conditions. Explanation; A. Incorrect - Plausible because neither of the individual SPING readings exceed the limit for a general emergency, but both meet the RS1. B. Incorrect - Plausible because Part 1 is correct. This would be correct if the readings are not summed correctly to meet RG1 for curies AND PAR is not being made from the control room without knowing TEDE and CDE. Answer is plausible if the candidate incorrectly executes the PARs flowchart. C. Incorrect - Plausible because Part 1 is correct. This would be correct if the readings are not summed correctly to meet RG1 for curies. D. Correct - The sum of reading on the Unit 2/3 Rx Bldg and Unit 2/3 Chimney SPINGs exceeds the 2.05 E+09 uCi/sec for greater than or equal to 15 minutes meets the threshold of RG1. Per the PARs flowchart, Evacuation should be recommended and based on wind direction the correct areas are 1, 2, 3, 4, 5, 7, 8, 10, 11 Execution of PARs flowchart requires the candidate to transverse multiple decision points. An error at any of these decision points will result in an incorrect PARs recommendation. **REQUIRED REFERENCES:** EP-AA-111-F-04, EP-AA-1004 Addendum 3 Hot and Cold Matrices

3.8 ELECTRICAL POWER SYSTEMS

3.8.b Battery Monitoring and Maintenance

TLCO 3.8.b Battery cell parameters for the 125 V and 250 V station batteries shall be within limits.

APPLICABILITY: When associated DC electrical power subsystems are required to be OPERABLE.

ACTIONS

--------------------------------------NOTE--------------------------------------
Separate Condition entry is allowed for each battery.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more batteries with one or more battery cell parameters not within Table T3.8.b-1 Category A or B limits.	A.1 <u>AND</u> A.2 Verify battery cell parameters meet Table T3.8.b-1 Category C limits.	 24 hours <u>AND</u> Once per 7 days thereafter
	<u>AND</u> A.3 Restore battery cell parameters to Table T3.8.b-1 Category A and B limits.	31 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ---------NOTE------- Required Actions B.1 and B.2 must be completed after LCO 3.8.6 “Battery Parameters,” Required Action D.3 is completed. ---------------------- One Battery with one or more cells with electrolyte level less than minimum established design limit.	B.1 Conduct an equalizing charge of the affected battery cell(s). <u>AND</u> B.2 Verify successful completion of appropriate testing for the affected cell(s).	31 days 31 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
TSR 3.8.b.1 Verify battery cell parameters meet Table T3.8.b-1 Category A limits.	7 days
TSR 3.8.b.2 Verify battery cell parameters meet Table T3.8.b-1 Category B limits.	92 days AND Once within 7 days after battery discharge < 105 V for 125 V batteries and < 210 V for 250 V batteries AND Once within 7 days after battery overcharge > 150 V for 125 V batteries and > 300 V for 250 V batteries
TSR 3.8.b.3 Verify average electrolyte temperature of representative cells is > 65°F.	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
TSR 3.8.b.4 Verify no visible corrosion at battery terminals and connectors. OR Verify total battery string connection resistance is less than or equal to the following values: Unit 2 125 Vdc Main Battery 3660 Micro- ohm Unit 2 125 Vdc Alternate Battery 3890 Micro-ohm Unit 2 250 Vdc Main Battery 4765 Micro-ohm Unit 3 125 Vdc Main Battery 2915 Micro-ohm Unit 3 125 Vdc Alternate Battery 3300 Micro-ohm Unit 3 250 Vdc Main Battery 4499 Micro-ohm	92 days
TSR 3.8.b.5 Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	12 months
TSR 3.8.b.6 Remove visible corrosion and verify battery cell to cell and terminal connections are coated with anti-corrosion material.	12 months
TSR 3.8.b.7 Verify battery connection total resistance is less than or equal to the following values: Unit 2 125 Vdc Main Battery 3660 Micro- ohm Unit 2 125 Vdc Alternate Battery 3890 Micro-ohm Unit 2 250 Vdc Main Battery 4765 Micro-ohm Unit 3 125 Vdc Main Battery 2915 Micro-ohm Unit 3 125 Vdc Alternate Battery 3300 Micro-ohm Unit 3 250 Vdc Main Battery 4499 Micro-ohm	12 months

Table T3.8.b-1 (page 1 of 1)
Battery Cell Parameter Requirements

PARAMETER	CATEGORY A: LIMITS FOR EACH DESIGNATED PILOT CELL	CATEGORY B: LIMITS FOR EACH CONNECTED CELL	CATEGORY C: LIMITS FOR EACH CONNECTED CELL
Electrolyte Level	> Minimum level indication mark, and ≤ ¼ inch above maximum level indication mark[(a)]	> Minimum level indication mark, and ≤ ¼ inch above maximum level indication mark[(a)]	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 V	≥ 2.13 V	> 2.07 V
Specific Gravity[(b)(c)]	≥ 1.200[(d)]	≥ 1.195 <u>AND</u> Average of all connected cells > 1.205	Not more than 0.020 below average of all connected cells <u>AND</u> Average of all connected cells ≥ 1.195

(a) It is acceptable for the electrolyte level to increase above the specified maximum level provided it is not overflowing.

(b) Corrected for electrolyte temperature and level.

(c) A battery charging current of ≤ 2 amps when on float charge is acceptable for meeting specific gravity limits following a battery recharge or the addition of water, for a maximum of 7 days. When charging current is used to satisfy specific gravity requirements, specific gravity of each connected cell shall be measured prior to expiration of the 7 day allowance.

(d) A battery charging current of ≤ 2 amps when on float charge is acceptable for meeting specific gravity limits (TS 3.8.6, TSR 3.8.b.1).

3.1 REACTIVITY CONTROL SYSTEMS

3.1.7 Standby Liquid Control (SLC) System

LCO 3.1.7 Two SLC subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SLC subsystem inoperable.	A.1 Restore SLC subsystem to OPERABLE status.	7 days
B. Two SLC subsystems inoperable.	B.1 Restore one SLC subsystem to OPERABLE status.	8 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify available volume of sodium pentaborate solution is within the limits of Figure 3.1.7-1.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.2	Verify temperature of sodium pentaborate solution is within the limits of Figure 3.1.7-2.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.3	Verify temperature of pump suction piping is ≥ 83°F.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.4	Verify continuity of explosive charge.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.5	Verify the concentration of sodium pentaborate in solution is within the limits of Figure 3.1.7-1.	In accordance with the Surveillance Frequency Control Program AND Once within 24 hours after water or sodium pentaborate is added to solution AND Once within 24 hours after solution temperature is restored within the limits of Figure 3.1.7-2
SR 3.1.7.6	Verify each SLC subsystem manual valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position, or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.7	Verify each pump develops a flow rate ≥ 40 gpm at a discharge pressure ≥ 1275 psig.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.1.7.8	Verify flow through one SLC subsystem from pump into reactor pressure vessel.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.9	Verify all heat traced piping between storage tank and pump suction is unblocked.	In accordance with the Surveillance Frequency Control Program AND Once within 24 hours after piping temperature is restored within the limits of Figure 3.1.7-2
SR 3.1.7.10	Verify sodium pentaborate enrichment is $\geq$ 45.0 atom percent B-10.	Prior to addition to SLC tank

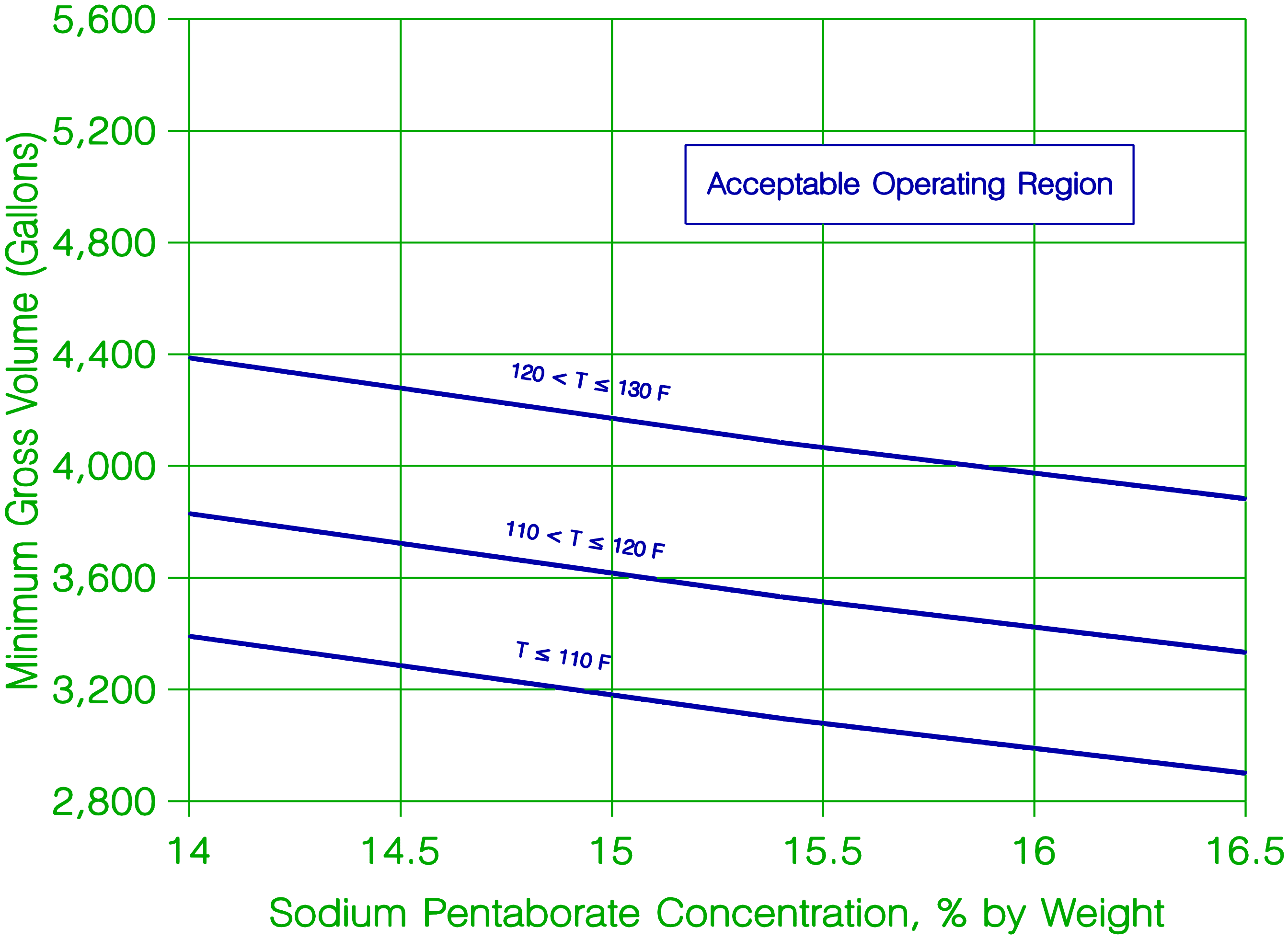


Figure 3.1.7-1 (page 1 of 1)
Sodium Pentaborate Volume Requirements

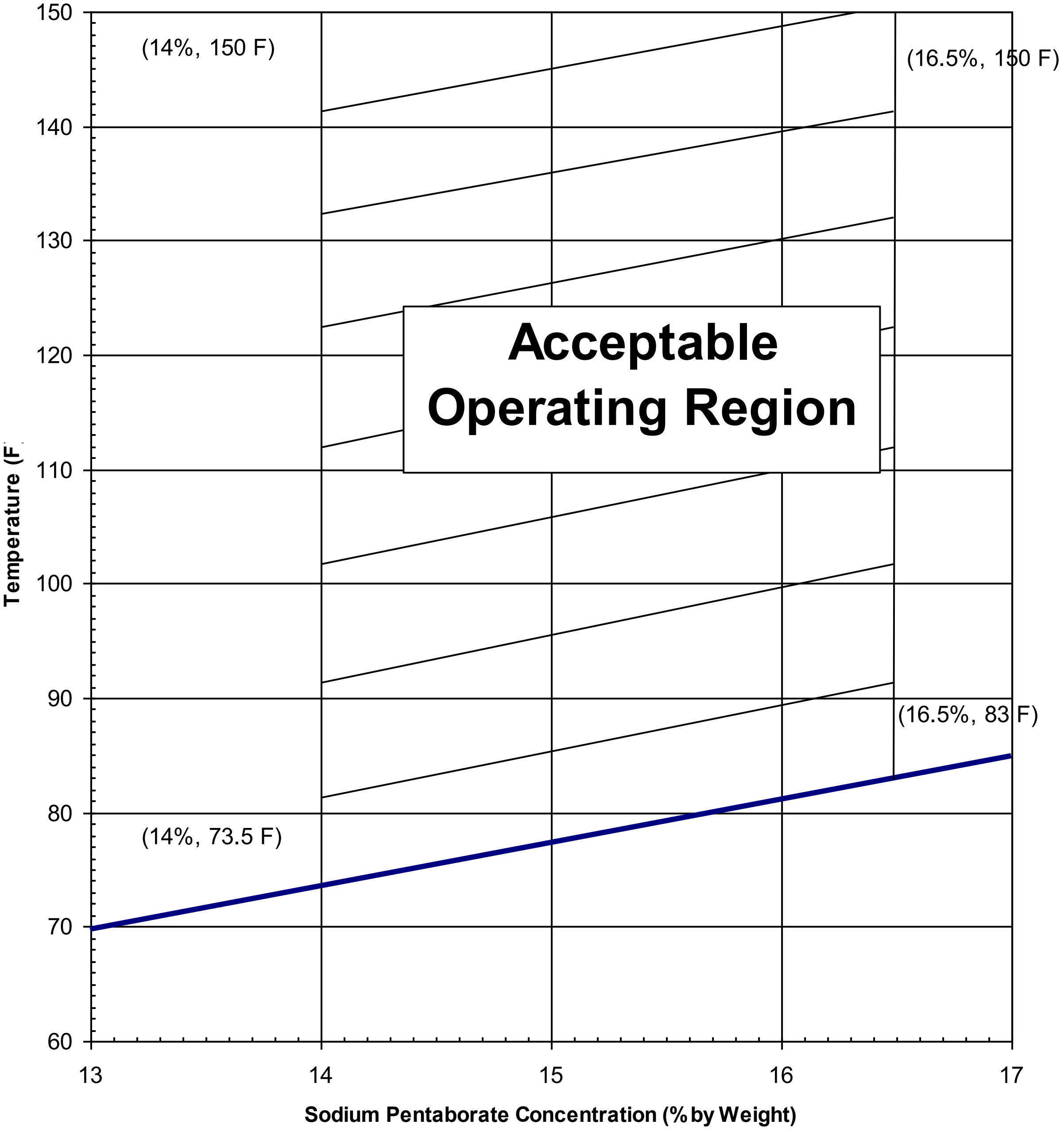


Figure 3.1.7-2 (page 1 of 1)
Sodium Pentaborate Temperature Requirements

3.3 INSTRUMENTATION

3.3.2.1 Control Rod Block Instrumentation

LCO 3.3.2.1 The control rod block instrumentation for each Function in Table 3.3.2.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.2.1-1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One rod block monitor (RBM) channel inoperable.	A.1 Restore RBM channel to OPERABLE status.	24 hours
B. Required Action and associated Completion Time of Condition A not met. OR Two RBM channels inoperable.	B.1	
C. Rod worth minimizer (RWM) inoperable during reactor startup.	C.1 OR	

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2.1.1 OR C.2.1.2 AND C.2.2 Verify movement of control rods is in compliance with analyzed rod position sequence by a second licensed operator or other qualified member of the technical staff.	During control rod movement
D. RWM inoperable during reactor shutdown.	D.1 Verify movement of control rods is in compliance with analyzed rod position sequence by a second licensed operator or other qualified member of the technical staff.	During control rod movement

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One or more Reactor Mode Switch—Shutdown Position channels inoperable.	E.1 <u>AND</u> E.2	

SURVEILLANCE REQUIREMENTS

------------------------------------ NOTES ------------------------------------

1. Refer to Table 3.3.2.1-1 to determine which SRs apply for each Control Rod Block Function.

2. When an RBM channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains control rod block capability.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.1.2	------------------NOTE------------------ Not required to be performed until 1 hour after any control rod is withdrawn at ≤ 10% RTP in MODE 2. -- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.1.3	------------------NOTE------------------ Not required to be performed until 1 hour after THERMAL POWER is ≤ 10% RTP in MODE 1. -- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.4	------------------NOTE------------------- Neutron detectors are excluded. -- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.1.5	------------------NOTE------------------- Neutron detectors are excluded. -- Verify the RBM is not bypassed when THERMAL POWER is ≥ 30% RTP and when a peripheral control rod is not selected.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.1.6	Verify the RWM is not bypassed when THERMAL POWER is ≤ 10% RTP.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.1.7	------------------NOTE------------------- Not required to be performed until 1 hour after reactor mode switch is in the shutdown position. -- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.8	Verify control rod sequences input to the RWM are in conformance with analyzed rod position sequence.	Prior to declaring RWM OPERABLE following loading of sequence into RWM
SR 3.3.2.1.9	Verify the bypassing and position of control rods required to be bypassed in RWM by a second licensed operator or other qualified member of the technical staff.	Prior to and during the movement of control rods bypassed in RWM

Table 3.3.2.1-1 (page 1 of 1)
Control Rod Block Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Rod Block Monitor				
a. Upscale	(a)	2	SR 3.3.2.1.1 SR 3.3.2.1.4 SR 3.3.2.1.5	As specified in the COLR
b. Inop	(a)	2	SR 3.3.2.1.1 SR 3.3.2.1.5	NA
c. Downscale	(a)	2	SR 3.3.2.1.1 SR 3.3.2.1.4 SR 3.3.2.1.5	≥ 4.03% RTP
2. Rod Worth Minimizer	1(b),2(b)	1	SR 3.3.2.1.2 SR 3.3.2.1.3 SR 3.3.2.1.6 SR 3.3.2.1.8 SR 3.3.2.1.9	NA
3. Reactor Mode Switch—Shutdown Position	(c)	2	SR 3.3.2.1.7	NA

(a) THERMAL POWER ≥ 30% RTP and no peripheral control rod selected.

(b) With THERMAL POWER ≤ 10% RTP.

(c) Reactor mode switch in the shutdown position.

3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Battery Parameters

LCO 3.8.6 Battery parameters for the 125 VDC and 250 VDC station batteries shall be within limits.

APPLICABILITY: When associated DC electrical power subsystems are required to be OPERABLE.

ACTIONS

-----------------------------------NOTE-----------------------------------

Separate Condition entry is allowed for each battery.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One 250 VDC or 125 VDC battery with one or more battery cells float voltage < 2.07 V.	A.1 Perform SR 3.8.4.1.	2 hours
	AND	
	A.2 Perform SR 3.8.6.1.	2 hours
	AND	
	A.3 Restore affected cell voltage to ≥ 2.07 V.	24 hours
B. One 250 VDC or 125 VDC battery with float current > 2 amps.	B.1 Perform SR 3.8.4.1.	2 hours
	AND	
	B.2 Restore battery float current to ≤ 2 amps.	12 hours

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One 250 VDC or 125 VDC battery with one or more battery cells float voltage < 2.07 V and float current > 2 amps.	C.1	
-----------NOTE----------- Required Action D.2 shall be completed if electrolyte level was below the top of plates. -------------------------- D. One 250 VDC or 125 VDC battery with one or more cells electrolyte level less than minimum established design limits.	-------------NOTE------------ Required Actions D.1 and D.2 are only applicable if electrolyte level was below the top of plates. ----------------------------- D.1 Restore electrolyte level to above top of plates.	8 hours
	<u>AND</u>	
	D.2 Verify no evidence of leakage.	12 hours
	<u>AND</u>	
	D.3 Restore electrolyte level to greater than or equal to minimum established design limits.	31 days
E. One 250 VDC or 125 VDC battery with pilot cell electrolyte temperature less than minimum established design limits.	E.1 Restore battery pilot cell temperature to greater than or equal to minimum established design limits.	12 hours

(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
F. One or more batteries in redundant divisions with battery parameters not within limits.	F.1	Restore battery parameters for batteries in one division to within limits.	2 hours
G. Required Action and associated Completion Time of Condition A, B, D, E, or F not met.	G.1		

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	--------------------NOTE------------------- Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. --- Verify each battery float current is ≤ 2 amps.	In accordance with the Surveillance Frequency Control Program
SR 3.8.6.2	Verify each battery pilot cell voltage is ≥ 2.07 V.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS

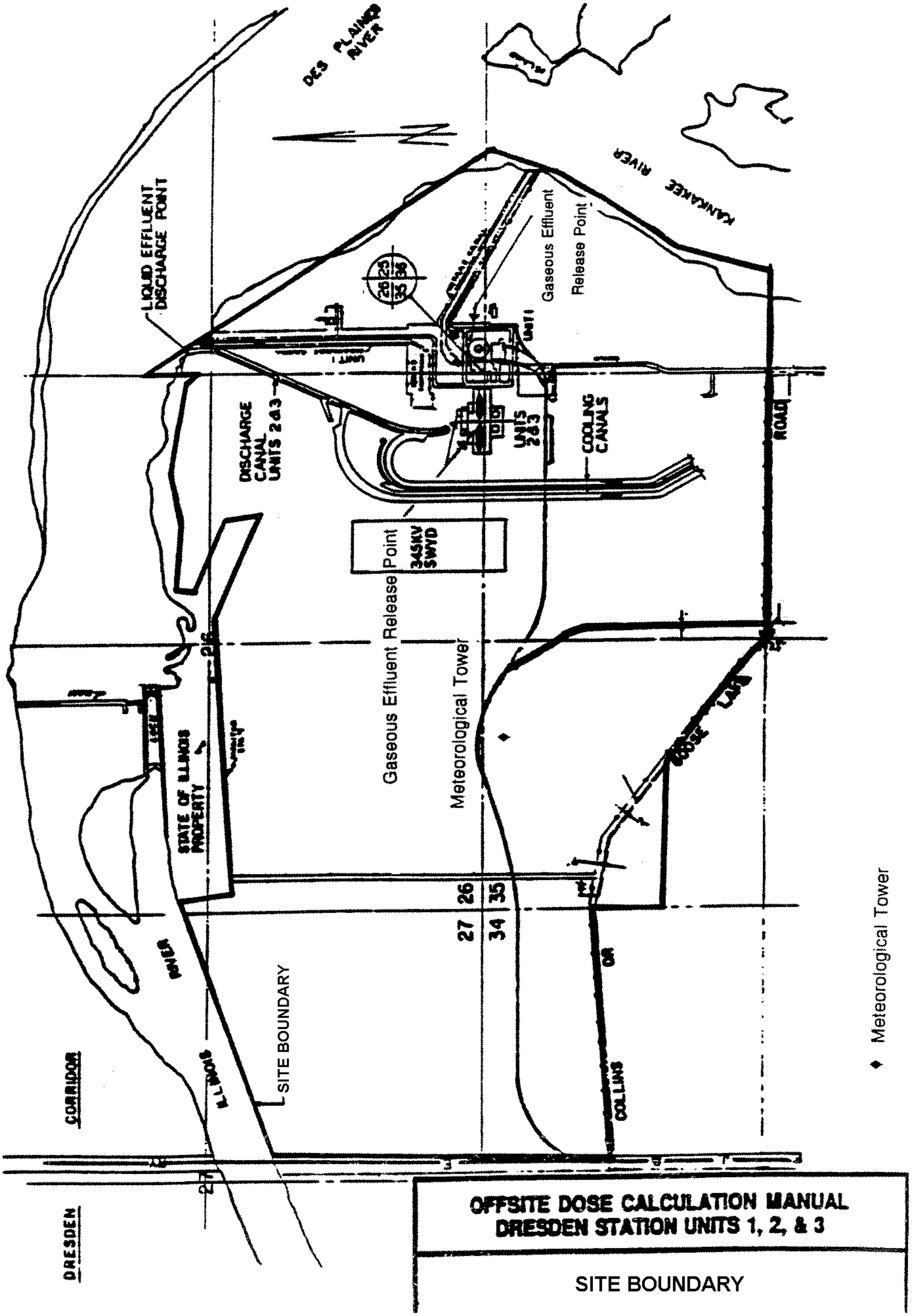
SURVEILLANCE		FREQUENCY
SR 3.8.6.3	Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.	In accordance with the Surveillance Frequency Control Program
SR 3.8.6.4	Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.	In accordance with the Surveillance Frequency Control Program
SR 3.8.6.5	Verify each battery connected cell voltage is $\geq$ 2.07 V.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.6	Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	In accordance with the Surveillance Frequency Control Program AND 12 months when battery shows degradation or has reached 85% of expected life with capacity < 100% of manufacturer's rating AND 24 months when battery has reached 85% of the expected life with capacity ≥ 100% of manufacturer's rating

DRESDEN



OFFSITE DOSE CALCULATION MANUAL
DRESDEN STATION UNITS 1, 2, & 3

SITE BOUNDARY

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Abnormal Rad Levels / Radiological Effluents				
Radiological Effluents	**RG1** Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mRem TEDE or 5,000 mRem thyroid CDE. 1 2 3 4 5 D **Emergency Action Level (EAL):** **Notes:** ● The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. ● If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. ● Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. ● The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. 1. The sum of readings on the Unit 2/3 Rx Bldg and Unit 2/3 Chimney SPINGs **> 2.05 E+09 uCi/sec** for **≥ 15 minutes** (as determined by DOP 1700-10 or PPDS – Total Noble Gas Release Rate). **OR** 2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER**: a. **> 1000 mRem TEDE.** **OR** b. **> 5000 mRem CDE Thyroid.** **OR** 3. Field survey results at or beyond the site boundary indicate **EITHER**: a. Gamma (closed window) dose rates **>1000 mR/hr** are expected to continue for **≥ 60 minutes**. **OR** b. Analyses of field survey samples indicate **> 5000 mRem CDE Thyroid** for **60 minutes** of inhalation.	**RS1** Release of gaseous radioactivity resulting in offsite dose greater than 100 mRem TEDE or 500 mRem thyroid CDE. 1 2 3 4 5 D **Emergency Action Level (EAL):** **Notes:** ● The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. ● If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. ● Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. ● The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. 1. The sum of readings on the Unit 2/3 Rx Bldg and Unit 2/3 Chimney SPINGs **> 2.05 E+08 uCi/sec** for **≥ 15 minutes** (as determined by DOP 1700-10 or PPDS – Total Noble Gas Release Rate). **OR** 2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER**: a. **> 100 mRem TEDE.** **OR** b. **> 500 mRem CDE Thyroid.** **OR** 3. Field survey results at or beyond the site boundary indicate **EITHER**: a. Gamma (closed window) dose rates **>100 mR/hr** are expected to continue for **≥ 60 minutes**. **OR** b. Analyses of field survey samples indicate **> 500 mRem CDE Thyroid** for **60 minutes** of inhalation.	**RA1** Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE. 1 2 3 4 5 D **Emergency Action Level (EAL):** **Notes:** ● The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. ● If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. ● Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. ● The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. 1. The sum of readings on the Unit 2/3 Rx Bldg and Unit 2/3 Chimney SPINGs **> 2.05 E+07 uCi/sec** for **≥ 15 minutes** (as determined by DOP 1700-10 or PPDS – Total Noble Gas Release Rate). **OR** 2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER**: a. **> 10 mRem TEDE.** **OR** b. **> 50 mRem CDE Thyroid.** **OR** 3. Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses greater than **EITHER** of the following at or beyond the site boundary a. **10 mRem** TEDE for **60 minutes** of exposure. **OR** b. **50 mRem** CDE Thyroid for **60 minutes** of exposure. **OR** 4. Field survey results at or beyond the site boundary indicate **EITHER**: a. Gamma (closed window) dose rates **> 10 mR/hr** are expected to continue for **≥ 60 minutes**. **OR** b. Analyses of field survey samples indicate **> 50 mRem CDE Thyroid** for **60 minutes** of inhalation.	**RU1** Any release of gaseous or liquid radioactivity to the environment greater than 2 times the ODCM for 60 minutes or longer. 1 2 3 4 5 D **Emergency Action Level (EAL):** **Notes:** ● The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. ● If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 60 minutes. ● Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. 1. Reading on **ANY** of the following effluent monitors **> 2 times alarm setpoint** established by a current radioactive release discharge permit for **≥ 60 minutes**. • Radwaste Effluent Monitor 2/3-2001-948 **OR** • Discharge Permit specified monitor **OR** 2. The sum of readings on the Unit 2/3 Rx Bldg and Unit 2/3 Chimney SPINGs **> 2.34 E+05 uCi/sec** for **≥ 60 minutes** (as determined by DOP 1700-10 or PPDS – Total Noble Gas Release Rate). **OR** 3. Confirmed sample analyses for gaseous or liquid releases indicate concentrations or release rates **> 2 times ODCM Limit** with a release duration of **≥ 60 minutes**.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT

Abnormal Rad Levels / Radiological Effluents

Radiological Effluents

GENERAL EMERGENCY

RG2 Spent fuel pool level cannot be restored to at least 0.60 ft. as indicated on 2(3)-1901-121A(B) for 60 minutes or longer. 1 2 3 4 5 D

Emergency Action Levels (EAL):

Note: The Emergency Director should declare the General Emergency promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

Spent fuel pool level cannot be restored to at least **0.60 ft**. as indicated on 2(3)-1901-121A(B) for **60 minutes** or longer.

Table R1
Fuel Handling Incident Radiation Monitors

- Refuel Floor High Range ARM Station #2(4)
- Fuel Pool Radiation Monitor

SITE AREA EMERGENCY

RS2 Spent fuel pool level at 0.60 ft. as indicated on 2(3)-1901-121A(B) 1 2 3 4 5 D

Emergency Action Level (EAL):

Lowering of spent fuel pool level to **0.60 ft**. as indicated on 2(3)-1901-121A(B).

Table R2
Areas Requiring Continuous Occupancy

- Main Control Room
- Central Alarm Station – (by survey)

Table R3
Areas with Entry Related Mode Applicability

Area	Unit	Entry Related Mode Applicability
Reactor Building 517' elevation • MCC 28-1 area • MCC 29-1 area • MCC 38-1 area • MCC 39-1 area • CRD 25 valve area 545' elevation • Bus 23-1 area • Bus 24-1 area • Bus 33-1 area • Bus 34-1 area • RWCU Pump Room 570' elevation • 250VDC MCC 2A area • 250VDC MCC 2B area • 250VDC MCC 3A area • 250VDC MCC 3B area 589' elevation • Isolation Condenser Floor	2(3)	Modes 3, 4, and 5
Cribhouse	2&3	
Turbine Building **495' elevation** • CRD Pump Area	2(3)	
534' elevation • Bus 23 area • Bus 24 area	2	
538' elevation • Bus 33 area • Bus 34 area	3	

ALERT

RA2 Significant lowering of water level above, or damage to, irradiated fuel. 1 2 3 4 5 D

Emergency Action Level (EAL):

1. Uncovery of irradiated fuel in the REFUELING PATHWAY.

OR

2. Damage to irradiated fuel resulting in a release of radioactivity from the fuel as indicated by **ANY** Table R1 Radiation Monitor reading **>1000 mRem/hr.**

OR

3. Lowering of spent fuel pool level to **10.20 ft**. as indicated on 2(3)-1901-121A(B).

RA3 Radiation levels that impede access to equipment necessary for normal plant operations, cooldown or shutdown. 1 2 3 4 5 D

Emergency Action Level (EAL):

Note: If the equipment in the room or area listed in Table R3 was already inoperable, or out of service, before the event occurred, then no emergency classification is warranted.

1. Dose rate **> 15 mR/hr** in **ANY** of the areas contained in Table R2.

OR

2. UNPLANNED event results in radiation levels that prohibit or significantly impede access to any of the areas contained in Table R3.

UNUSUAL EVENT

RU2 Unplanned loss of water level above irradiated fuel. 1 2 3 4 5 D

Emergency Action Level (EAL):

1. a. UNPLANNED water level drop in the REFUELING PATHWAY as indicated by **ANY** of the following:
   - Refueling Cavity water level **< 466 in.** (Refuel Outage Reactor Vessel and Cavity Level Instrument LI 2(3)-263-114).

     OR
   - Spent Fuel Pool water level **< 19 ft**. above the fuel (**< 33 ft. 9 in**. indicated level).

     OR
   - Indication or report of a drop in water level in the REFUELING PATHWAY.

   AND

   b. UNPLANNED Area Radiation Monitor reading rise on **ANY** radiation monitors in Table R1.

RU3 Reactor coolant activity greater than Technical Specification allowable limits. 1 2 3

Emergency Action Level (EAL):

1. Offgas system radiation monitor **HI-HI** alarm.

OR

2. Specific coolant activity **> 4.0 µCi/gm** Dose equivalent I-131.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

Fission Product Barrier Matrix **Hot Matrix**

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT
FG1 Loss of any two barriers AND Loss or Potential Loss of third barrier. 1 2 3	**FS1** Loss or Potential Loss of ANY two barriers. 1 2 3	**FA1** ANY Loss or ANY Potential Loss of either Fuel Clad or RCS 1 2 3

Sub-Category	FC – Fuel Clad		RC – Reactor Coolant System		CT - Containment	
	Loss	**Potential Loss**	**Loss**	**Potential Loss**	**Loss**	**Potential Loss**
1. RCS Activity	Coolant activity **> 300 µCi/gm** Dose Equivalent I-131.	None	None	None	None	None
2. RPV Water Level	1. It **cannot** be determined that core debris will be retained in the RPV.	2. RPV water level **cannot** be restored and maintained **> -143 inches** (TAF). **OR** 3. RPV water level **cannot** be determined.	1. RPV water level **cannot** be restored and maintained **> -143 inches** (TAF). **OR** 2. RPV water level **cannot** be determined.	None	None	It **cannot** be determined that core debris will be retained in the RPV.
3. Primary Containment Pressure/Conditions	None	None	1. Drywell pressure **>2.0 psig.** **AND** 2. Drywell pressure rise is due to RCS leakage.	None	1. UNPLANNED rapid drop in Drywell pressure following Drywell pressure rise. **OR** 2. Drywell pressure response **not** consistent with LOCA conditions.	3. Drywell pressure **≥ 62 psig** and rising. **OR** 4. a. Drywell or torus hydrogen concentration **≥ 6%.** **AND** b. Drywell or torus oxygen concentration **≥ 5%.** **OR** 5. Heat Capacity Limit (DEOP 200-1, Fig.M) exceeded.
4.RCS Leak Rate	None	None	1. UNISOLABLE Main Steam Line (MSL), Isolation Condenser, HPCI, Feedwater, or RWCU line break. **OR** 2. Emergency RPV Depressurization is required.	3. UNISOLABLE primary system leakage that results in **EITHER** of the following: a. Secondary Containment area temperature **> DEOP 300-1 Maximum Normal** operating levels. **OR** b. Secondary Containment area radiation level **> DEOP 300-1 Maximum Normal** operating level.	None	None
5.Primary Containment Radiation	Drywell radiation monitor reading **> 1.53 E+03 R/hr (1530 R/hr).**	None	Drywell radiation monitor reading **> 100R/hr (>1.00 E+02 R/hr).**	None	None	Drywell radiation monitor reading **> 1.99 E+04 R/hr (19,900 R/hr).**
6.Primary Containment Isolation Failure	None	None	None	None	1. UNISOLABLE direct downstream pathway to the environment exists after primary containment isolation signal. **OR** 2. Intentional Primary Containment venting/purging per EOPs or SAMGs due to accident conditions. **OR** 3. UNISOLABLE primary system leakage that results in Secondary Containment area temperature **> DEOP 300-1, Maximum Safe** operating levels.	None
7. Emergency Director Judgment	**ANY** Condition in the opinion of the Emergency Director that indicates Loss of the Fuel Clad Barrier.	**ANY** Condition in the opinion of the Emergency Director that indicates Potential Loss of the Fuel Clad Barrier.	**ANY** Condition in the opinion of the Emergency Director that indicates Loss of the RCS Barrier.	**ANY** Condition in the opinion of the Emergency Director that indicates Potential Loss of the RCS Barrier.	**ANY** Condition in the opinion of the Emergency Director that indicates Loss of the Containment Barrier.	**ANY** Condition in the opinion of the Emergency Director that indicates Potential Loss of the Containment Barrier.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
System Malfunction				
Loss of AC Power	**MG1** Prolonged loss of all offsite and all onsite AC power to emergency buses. 1 2 3 **<u>Emergency Action Level (EAL):</u>** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. a. Loss of **ALL** offsite and onsite AC power to unit 4KV ECCS buses. **AND** b. **EITHER** of the following: • Restoration of at least one unit 4KV ECCS bus in **< 4 hours** is **<u>not</u>** likely. **OR** • RPV water level **<u>cannot</u>** be restored and maintained **> -163 inches.**	**MS1** Loss of all Off-site and On-Site AC power to emergency busses for 15 minutes or longer. 1 2 3 **<u>Emergency Action Level (EAL):</u>** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. a. Loss of **ALL** offsite and onsite AC Power to unit 4KV ECCS buses. **AND** b. Failure to restore power to at least one unit 4KV ECCS bus in **< 15 minutes** from the time of loss of both offsite and onsite AC power.	**MA1** Loss of all but one AC power source to emergency buses for 15 minutes or longer. 1 2 3 **<u>Emergency Action Level (EAL):</u>** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. a. AC power capability to unit 4KV ECCS buses reduced to only one of the following power sources for **≥ 15 minutes.** • Reserve auxiliary Transformer TR-22 (TR-32) • Unit auxiliary transformer TR-21 (TR-31) • Unit Emergency Diesel Generator DG 2(3) • Shared Emergency Diesel Generator DG 2/3 • Unit crosstie breakers **AND** b. **ANY** additional single power source failure will result in a loss of **ALL** AC power to SAFETY SYSTEMs.	**MU1** Loss of all offsite AC power capability to emergency buses for 15 minutes or longer. 1 2 3 **<u>Emergency Action Level (EAL):</u>** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. Loss of **ALL** offsite AC power capability to unit 4KV ECCS buses for **≥ 15 minutes**.
Loss of DC Power	**MG2** Loss of all AC and Vital DC power sources for 15 minutes or longer. 1 2 3 **<u>Emergency Action Level (EAL):</u>** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. a. Loss of **ALL** offsite and onsite AC power to unit 4KV ECCS buses. **AND** b. Voltage is **< 105 VDC** on 125 VDC battery busses #2 and #3. **AND** c. **ALL** AC and Vital DC power sources have been lost for **≥ 15 minutes.**	**MS2** Loss of all Vital DC power for 15 minutes or longer. 1 2 3 **<u>Emergency Action Level (EAL):</u>** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. Voltage is **< 105 VDC** on 125 VDC battery buses #2 and #3 for **≥ 15 minutes.**		

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
System Malfunction				
RPS Failure		**MS3** Inability to shutdown the reactor causing a challenge to RPV water level or RCS heat removal. 1 2 **Emergency Action Level (EAL):** 1. Automatic scram did **not** shutdown the reactor as indicated by Reactor Power **> 6%**. **AND** 2. **ALL** manual / ARI actions to shutdown the reactor have been unsuccessful as indicated by Reactor Power **> 6%**. **AND** 3. **EITHER** of the following conditions exist: • RPV water level **cannot** be restored and maintained **> -163 inches.** **OR** • Heat Capacity Limit (DEOP 200-1, Fig. M) exceeded.	**MA3** Automatic or manual scram fails to shutdown the reactor, and subsequent manual actions taken at the reactor control consoles are not successful in shutting down the reactor. 1 2 **Emergency Action Level (EAL):** **Note:** A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does not include manually driving in control rods or implementation of boron injection strategies. 1. Automatic or manual scram did **not** shutdown the reactor as indicated by Reactor Power **> 6%.** **AND** 2. Manual / ARI actions taken at the reactor control consoles are **not** successful in shutting down the reactor as indicated by Reactor Power **> 6%.**	**MU3** Automatic or manual scram fails to shutdown the reactor. 1 2 **Emergency Action Level (EAL):** **Note:** A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does not include manually driving in control rods or implementation of boron injection strategies. 1. a. Automatic scram did **not** shutdown the reactor as indicated by Reactor Power **> 6%.** **AND** b. Subsequent manual / ARI action taken at the reactor control consoles is successful in shutting down the reactor as indicated by Reactor Power **≤ 6%**. **OR** 2. a. Manual scram did **not** shutdown the reactor as indicated by Reactor Power **> 6%.** **AND** b. **EITHER** of the following: 1. Subsequent manual / ARI action taken at the reactor control consoles is successful in shutting down the reactor as indicated by Reactor Power **≤ 6%.** **OR** 2. Subsequent automatic scram / ARI is successful in shutting down the reactor as indicated by Reactor Power **≤ 6%.**
Control Room Indications	**Table M1 Control Room Parameters** • Reactor Power • RPV Water Level • RPV Pressure • Primary Containment Pressure • Torus Level • Torus Temperature	**Table M2 Significant Transients** • Turbine Trip • Reactor Scram • ECCS Activation • Recirc. Runback **> 25%** Reactor Power Change • Thermal Power oscillations **> 10%** Reactor Power Change	**MA4** UNPLANNED loss of Control Room indications for 15 minutes or longer with a significant transient in progress. 1 2 3 **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. **ANY** Table M1 parameter **cannot** be determined from within the Control Room for **≥ 15 minutes** due to an UNPLANNED event. **AND** 2. **ANY** Table M2 transient in progress.	**MU4** UNPLANNED loss of Control Room indications for 15 minutes or longer. 1 2 3 **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. **ANY** Table M1 parameter **cannot** be determined from within the Control Room for **≥ 15 minutes** due to an UNPLANNED event.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT

System Malfunction

Hazard affects Safety System

MA5 Hazardous event affecting a SAFETY SYSTEM required for the current operating mode. 1 2 3

Emergency Action Level (EAL):

Note:

- This EAL is only applicable to SAFETY SYSTEMs having two (2) or more trains.
- If the affected SAFETY SYSTEM train was already inoperable before the hazardous event occurred, then this emergency classification is not warranted.
- If the hazardous event only resulted in VISIBLE DAMAGE, with no indications of degraded performance to at least one train of a SAFETY SYSTEM, then this emergency classification is not warranted.
- If a hazardous event occurs and it is determined that the conditions of MA5 are not met then assess the event via HU3, HU4, or HU6.

1. a. The occurrence of **ANY** of the following hazardous events:
    - Seismic event (earthquake)
    - Internal or external flooding event
    - High winds or tornado strike
    - FIRE
    - EXPLOSION
    - Other events with similar hazard characteristics as determined by the Shift Manager

   AND

   b. Event damage has caused indications of degraded performance to one train of a SAFETY SYSTEM required by Technical Specifications for the current operating mode.

   AND

   c. **EITHER** of the following:
    - Event damage has caused indications of degraded performance to a second train of the SAFETY SYSTEM required by Technical Specifications for the current operating mode.

      OR
    - Event damage has resulted in VISIBLE DAMAGE to a second train of the SAFETY SYSTEM required by Technical Specifications for the current operating mode.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT

System Malfunction

RCS Leak

MU6 RCS leakage for 15 minutes or longer. $\boxed{1}\boxed{2}\boxed{3}$

Emergency Action Level (EAL):

Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1. RCS unidentified or pressure boundary leakage in the Drywell **> 10 gpm** for **≥ 15 minutes**

   OR

2. RCS identified leakage in the Drywell **>25 gpm** for **≥ 15 minutes**

   OR

3. Leakage from the RCS to a location outside the Drywell **>25 gpm** for **≥ 15 minutes**

Communications

Table M3 Communications Capability

System	Onsite	Offsite	NRC
Plant Radio	X		
Plant Page	X		
All telephone Lines (Commercial and microwave)	X	X	X
ENS		X	X
HPN		X	X
Satellite Phones		X	X

MU7 Loss of all On-site or Off-site communication capabilities. $\boxed{1}\boxed{2}\boxed{3}$

Emergency Action Level (EAL):

1. Loss of **ALL** Table M3 **Onsite** communications capability affecting the ability to perform routine operations.

   OR

2. Loss of **ALL** Table M3 **Offsite** communication capability affecting the ability to perform offsite notifications.

   OR

3. Loss of **ALL** Table M3 **NRC** communication capability affecting the ability to perform NRC notifications.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D - Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety				
Hostile Action		**HS1** HOSTILE ACTION within the PROTECTED AREA 1 2 3 4 5 D **Emergency Action Level (EAL):** A notification from the Security Force that a HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA.	**HA1** HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes. 1 2 3 4 5 D **Emergency Action Level (EAL):** 1. A validated notification from NRC of an aircraft attack threat **< 30 minutes** from the site. **OR** 2. Notification by the Security Force that a HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLED AREA.	**HU1** Confirmed SECURITY CONDITION or threat. 1 2 3 4 5 D **Emergency Action Level (EAL):** 1. Notification of a credible security threat directed at the site as determined per SY-AA-101-132, Security Assessment and Response to Unusual Activities. **OR** 2. A validated notification from the NRC providing information of an aircraft threat. **OR** 3. Notification by the Security Force of a SECURITY CONDITION that does **not** involve a HOSTILE ACTION.
Transfer of Plant Control	**Table H1 Safety Functions** • Reactivity Control (ability to shut down the reactor and keep it shutdown) • RPV Water Level (ability to cool the core) • RCS Heat Removal (ability to maintain a heat sink)	**HS2** Inability to control a key safety function from outside the Control Room 1 2 3 4 5 D **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. A Control Room evacuation has resulted in plant control being transferred from the Control Room to alternate locations per DSSP 0100-CR, Hot Shutdown Procedure – Control Room Evacuation. **AND** 2. Control of **ANY** Table H1 key safety function is **not** reestablished in **< 30 minutes**.	**HA2** Control Room evacuation resulting in transfer of plant control to alternate locations 1 2 3 4 5 D **Emergency Action Level (EAL):** A Control Room evacuation has resulted in plant control being transferred from the Control Room to alternate locations per DSSP 0100-CR, Hot Shutdown Procedure – Control Room Evacuation.	

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT

Hazards and Other conditions Affecting Plant Safety

Fire

Table H2 Vital Areas

- Reactor Building (when inerted the Drywell is exempt)
- Aux Electric Room
- Control Room
- Unit and Shared Emergency Diesel Generator Rooms
- 4KV ECCS Switchgear Area (includes Bus 23, 24, 33 and 34 only)
- Battery Rooms
- CRD & CCSW Pump Rooms
- Turbine Building Cable Tunnel
- Turbine Building Safe Shutdown Areas as follows:
  - B- Train Control Room HVAC Room
  - Battery Rooms and DC Distribution Areas
    1) U2 Battery Room (includes DC switchgear, 125V, and 250V battery rooms)
    2) U3 Battery Room, Battery Cage area, and U3 Battery Charger Room (all on U3 TB 538)
- Crib House

HU3 FIRE potentially degrading the level of safety of the plant. 1 2 3 4 5 D

Emergency Action Level (EAL):

Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

Escalation of the emergency classification level would be via IC CA2 or MA5

1. A FIRE in **ANY** Table H2 area is **not** extinguished in **< 15-minutes** of **ANY** of the following FIRE detection indications:
   - Report from the field (i.e., visual observation).
   - Receipt of multiple (more than 1) fire alarms or indications.
   - Field verification of a single fire alarm.

   OR
2. a. Receipt of a single fire alarm in **ANY** Table H2 area (i.e., no other indications of a FIRE).
   AND
   b. The existence of a FIRE is **not** verified in **< 30 minutes** of alarm receipt.

   OR
3. A FIRE within the plant PROTECTED AREA not extinguished in **< 60-minutes** of the initial report, alarm or indication.

   OR
4. A FIRE within the plant PROTECTED AREA that requires firefighting support by an offsite fire response agency to extinguish.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D - Defueled

GENERAL EMERGENCY		SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety				
Earthquake				**HU4** Seismic event greater than OBE levels 1 2 3 4 5 D **Emergency Action Level (EAL):** **Note**: Escalation of the emergency classification level would be via IC CA2 or MA5 For emergency classification if EAL 2 is not able to be confirmed, then the occurrence of a seismic event is confirmed in manner deemed appropriate by the Shift Manager or Emergency Director in **≤ 15 mins** of the event. Seismic event as indicated by: 1. Control Room personnel feel an actual or potential seismic event. **AND** 2. **ANY** one of the following confirmed in **≤ 15 mins** of the event: • The earthquake resulted in Modified Mercalli Intensity (MMI) **≥ VI** and occurred **≤ 3.5 miles** of the plant. • The earthquake was magnitude **≥ 6.0**. • The earthquake was magnitude **≥ 5.0** and occurred **≤ 125 miles** of the plant.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D - Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety				
Toxic Gas			**HA5** Gaseous release impeding access to equipment necessary for normal plant operations, cooldown or shutdown. 3 4 5 **Emergency Action Level (EAL):** **Note**: If the equipment in the listed room or area was already inoperable, or out of service, before the event occurred, then no emergency classification is warranted. 1. Release of a toxic, corrosive, asphyxiant or flammable gas in a Table H3 area. **AND** 2. Entry into the room or area is prohibited or impeded.	
Hazardous Event				**HU6** Hazardous Event 1 2 3 4 5 D **Emergency Action Level (EAL):** **Note:** EAL #4 does not apply to routine traffic impediments such as fog, snow, ice, or vehicle breakdowns or accidents. Escalation of the emergency classification level would be via IC CA2 or MA5 1. Tornado strike within the PROTECTED AREA. **OR** 2. Internal room or area flooding of a magnitude sufficient to require manual or automatic electrical isolation of a SAFETY SYSTEM component required by Technical Specifications for the current operating mode. **OR** 3. Movement of personnel within the PROTECTED AREA is impeded due to an offsite event involving hazardous materials (e.g., an offsite chemical spill or toxic gas release). **OR** 4. A hazardous event that results in on-site conditions sufficient to prohibit the plant staff from accessing the site via personal vehicles. **OR** 5. Abnormal River level, as indicated by **EITHER**: a. High river level **> 510 ft. 4 inches.** **OR** b. Low river level **< 501 ft. 6 inches.**

Table H3
Areas with Entry Related Mode Applicability

Area	Unit	Entry Related Mode Applicability
Reactor Building 517’ elevation • MCC 28-1 area • MCC 29-1 area • MCC 38-1 area • MCC 39-1 area • CRD 25 valve area 545’ elevation • Bus 23-1 area • Bus 24-1 area • Bus 33-1 area • Bus 34-1 area • RWCU Pump Room 570’ elevation • 250VDC MCC 2A area • 250VDC MCC 2B area • 250VDC MCC 3A area • 250VDC MCC 3B area 589’ elevation • Isolation Condenser Floor	2(3)	Modes 3, 4, and 5
Cribhouse	2&3	
Turbine Building **495’ elevation** • CRD Pump Area	2(3)	
534’ elevation • Bus 23 area • Bus 24 area	2	
538’ elevation • Bus 33 area • Bus 34 area	3	

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D - Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety				
Emergency Director Judgment	**HG7** Other conditions exist which in the judgment of the Emergency Director warrant declaration of a GENERAL EMERGENCY. 1 2 3 4 5 D **Emergency Action Level (EAL):** Other conditions exist which in the judgment of the Emergency Director 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 offsite for more than the immediate site area.	**HS7** Other conditions exist which in the judgment of the Emergency Director warrant declaration of a SITE AREA EMERGENCY. 1 2 3 4 5 D **Emergency Action Level (EAL):** Other conditions exist which in the judgment of the Emergency Director 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.	**HA7** Other conditions exist which in the judgment of the Emergency Director warrant declaration of an ALERT. 1 2 3 4 5 D **Emergency Action Level (EAL):** Other conditions exist which, in the judgment of the Emergency Director, 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.	**HU7** Other conditions exist which in the judgment of the Emergency Director warrant declaration of an UNUSUAL EVENT. 1 2 3 4 5 D **Emergency Action Level (EAL):** Other conditions exist which in the judgment of the Emergency Director 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.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
ISFSI Malfunction				
ISFSI				**E-HU1** Damage to a loaded cask CONFINEMENT BOUNDARY. $\boxed{1}\boxed{2}\boxed{3}\boxed{4}\boxed{5}\boxed{D}$ **Emergency Action Level (EAL):** Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading: 1. EAST HI-STAR • **> 160 mrem/hr** (neutron + gamma) on the top of the Overpack. **OR** • **> 250 mrem/hr** (neutron+ gamma) on the side of the Overpack. **OR** 2. EAST HI-STORM • **> 20 mrem/hr** (neutron+ gamma) on the top of the Overpack. **OR** • **> 100 mrem/hr** (neutron+ gamma) on the side of the Overpack. **OR** • **> 90 mrem/hr** (neutron+ gamma) at the inlet and outlet vent ducts of the Overpack. **OR** 3. WEST HI-STORM (labeled as xxx-A2) • **> 40 mrem/hr** (neutron+ gamma) on the top of the Overpack. **OR** • **> 220 mrem/hr** (neutron+ gamma) on the side of the Overpack, excluding inlet and outlet ducts. **OR** 4. WEST HI-STORM (labeled as xxx-A8) • **> 60 mrem/hr** (neutron+ gamma) on the top of the Overpack. **OR** • **> 600 mrem/hr** (neutron+ gamma) on the side of the Overpack, excluding inlet and outlet ducts.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D - Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Abnormal Rad Levels / Radiological Effluents				
Radiological Effluents	**RG1** Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mRem TEDE or 5,000 mRem thyroid CDE. 1 2 3 4 5 D **Emergency Action Level (EAL):** **Notes:** ● The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. ● If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. ● Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. ● The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. 1. The sum of readings on the Unit 2/3 Rx Bldg and Unit 2/3 Chimney SPINGs **> 2.05 E+09 uCi/sec** for **≥ 15 minutes** (as determined by DOP 1700-10 or PPDS – Total Noble Gas Release Rate). **OR** 2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER**: **a. > 1000 mRem TEDE.** **OR** **b. > 5000 mRem CDE Thyroid.** **OR** 3. Field survey results at or beyond the site boundary indicate **EITHER**: a. Gamma (closed window) dose rates **>1000 mR/hr** are expected to continue for **≥ 60 minutes**. **OR** b. Analyses of field survey samples indicate **> 5000 mRem CDE Thyroid** for **60 minutes** of inhalation.	**RS1** Release of gaseous radioactivity resulting in offsite dose greater than 100 mRem TEDE or 500 mRem thyroid CDE. 1 2 3 4 5 D **Emergency Action Level (EAL):** **Notes:** ● The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. ● If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. ● Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. ● The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. 1. The sum of readings on the Unit 2/3 Rx Bldg and Unit 2/3 Chimney SPINGs **> 2.05 E+08 uCi/sec** for **≥ 15 minutes** (as determined by DOP 1700-10 or PPDS – Total Noble Gas Release Rate). **OR** 2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER**: **a. > 100 mRem TEDE.** **OR** **b. > 500 mRem CDE Thyroid.** **OR** 3. Field survey results at or beyond the site boundary indicate **EITHER**: a. Gamma (closed window) dose rates **>100 mR/hr** are expected to continue for **≥ 60 minutes**. **OR** b. Analyses of field survey samples indicate **> 500 mRem CDE Thyroid** for **60 minutes** of inhalation.	**RA1** Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE. 1 2 3 4 5 D **Emergency Action Level (EAL):** **Notes:** ● The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. ● If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. ● Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. ● The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. 1. The sum of readings on the Unit 2/3 Rx Bldg and Unit 2/3 Chimney SPINGs **> 2.05 E+07 uCi/sec** for **≥ 15 minutes** (as determined by DOP 1700-10 or PPDS – Total Noble Gas Release Rate). **OR** 2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of **EITHER**: **a. > 10 mRem TEDE.** **OR** **b. > 50 mRem CDE Thyroid.** **OR** 3. Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses greater than **EITHER** of the following at or beyond the site boundary a. **10 mRem** TEDE for **60 minutes** of exposure. **OR** b. **50 mRem** CDE Thyroid for **60 minutes** of exposure. **OR** 4. Field survey results at or beyond the site boundary indicate **EITHER**: a. Gamma (closed window) dose rates **> 10 mR/hr** are expected to continue for **≥ 60 minutes**. **OR** b. Analyses of field survey samples indicate **> 50 mRem CDE Thyroid** for **60 minutes** of inhalation.	**RU1** Any release of gaseous or liquid radioactivity to the environment greater than 2 times the ODCM for 60 minutes or longer. 1 2 3 4 5 D **Emergency Action Level (EAL):** **Notes:** ● The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. ● If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 60 minutes. ● Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. 1. Reading on **ANY** of the following effluent monitors **> 2 times alarm setpoint** established by a current radioactive release discharge permit for **≥ 60 minutes**. • Radwaste Effluent Monitor 2/3-2001-948 **OR** • Discharge Permit specified monitor **OR** 2. The sum of readings on the Unit 2/3 Rx Bldg and Unit 2/3 Chimney SPINGs **> 2.34 E+05 uCi/sec** for **≥ 60 minutes** (as determined by DOP 1700-10 or PPDS – Total Noble Gas Release Rate). **OR** 3. Confirmed sample analyses for gaseous or liquid releases indicate concentrations or release rates **> 2 times ODCM Limit** with a release duration of **≥ 60 minutes**.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT

Abnormal Rad Levels / Radiological Effluents

Radiological Effluents

GENERAL EMERGENCY

RG2 Spent fuel pool level cannot be restored to at least 0.60 ft. as indicated on 2(3)-1901-121A(B) for 60 minutes or longer. 1 2 3 4 5 D

Emergency Action Levels (EAL):

Note: The Emergency Director should declare the General Emergency promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

Spent fuel pool level cannot be restored to at least **0.60 ft**. as indicated on 2(3)-1901-121A(B) for **60 minutes** or longer.

Table R1 Fuel Handling Incident Radiation Monitors
• Refuel Floor High Range ARM Station #2(4) • Fuel Pool Radiation Monitor

SITE AREA EMERGENCY

RS2 Spent fuel pool level at 0.60 ft. as indicated on 2(3)-1901-121A(B) 1 2 3 4 5 D

Emergency Action Level (EAL):

Lowering of spent fuel pool level to **0.60 ft**. as indicated on 2(3)-1901-121A(B).

Table R2 Areas Requiring Continuous Occupancy
• Main Control Room • Central Alarm Station – (by survey)

Table R3
Areas with Entry Related Mode Applicability

Area	Unit	Entry Related Mode Applicability
Reactor Building 517' elevation • MCC 28-1 area • MCC 29-1 area • MCC 38-1 area • MCC 39-1 area • CRD 25 valve area 545' elevation • Bus 23-1 area • Bus 24-1 area • Bus 33-1 area • Bus 34-1 area • RWCU Pump Room 570' elevation • 250VDC MCC 2A area • 250VDC MCC 2B area • 250VDC MCC 3A area • 250VDC MCC 3B area 589' elevation • Isolation Condenser Floor	2(3)	Modes 3, 4, and 5
Cribhouse	2&3	
Turbine Building **495' elevation** • CRD Pump Area	2(3)	
534' elevation • Bus 23 area • Bus 24 area	2	
538' elevation • Bus 33 area • Bus 34 area	3	

ALERT

RA2 Significant lowering of water level above, or damage to, irradiated fuel. 1 2 3 4 5 D

Emergency Action Level (EAL):

1. Uncovery of irradiated fuel in the REFUELING PATHWAY.

   OR
2. Damage to irradiated fuel resulting in a release of radioactivity from the fuel as indicated by **ANY** Table R1 Radiation Monitor reading **>1000 mRem/hr.**

   OR
3. Lowering of spent fuel pool level to **10.20 ft**. as indicated on 2(3)-1901-121A(B).

RA3 Radiation levels that impede access to equipment necessary for normal plant operations, cooldown or shutdown. 1 2 3 4 5 D

Emergency Action Level (EAL):

Note: If the equipment in the room or area listed in Table R3 was already inoperable, or out of service, before the event occurred, then no emergency classification is warranted.

1. Dose rate **> 15 mR/hr** in **ANY** of the areas contained in Table R2.

   OR
2. UNPLANNED event results in radiation levels that prohibit or significantly impede access to any of the areas contained in Table R3.

UNUSUAL EVENT

RU2 Unplanned loss of water level above irradiated fuel. 1 2 3 4 5 D

Emergency Action Level (EAL):

1. a. UNPLANNED water level drop in the REFUELING PATHWAY as indicated by **ANY** of the following:
   - Refueling Cavity water level **< 466 in.** (Refuel Outage Reactor Vessel and Cavity Level Instrument LI 2(3)-263-114).

     OR
   - Spent Fuel Pool water level **< 19 ft**. above the fuel (**< 33 ft. 9 in**. indicated level).

     OR
   - Indication or report of a drop in water level in the REFUELING PATHWAY.

   AND

   b. UNPLANNED Area Radiation Monitor reading rise on **ANY** radiation monitors in Table R1.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Cold Shutdown / Refueling System Malfunctions				
Loss of AC Power			**CA1** Loss of all offsite and onsite AC power to emergency busses for 15 minutes or longer. 4 5 D **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. a. Loss of **ALL** offsite and onsite AC power to unit 4KV ECCS buses. **AND** b. Failure to restore power to at least one unit 4KV ECCS bus in **< 15 minutes** from the time of loss of both offsite and onsite AC power.	**CU1** Loss of all but one AC power source to emergency buses for 15 minutes or longer. 4 5 D **Emergency Action Level (EAL):** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. a. AC power capability to unit 4KV ECCS buses reduced to only one of the following power sources for **≥ 15 minutes.** • Reserve auxiliary Transformer TR-22 (TR-32) • Unit auxiliary transformer TR-21 (TR-31) • Unit Emergency Diesel Generator DG 2(3) • Shared Emergency Diesel Generator DG 2/3 • Unit crosstie breakers **AND** b. **ANY** additional single power source failure will result in a loss of **ALL** AC power to SAFETY SYSTEMs.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Cold Shutdown / Refueling System Malfunctions				
Safety System			**CA2** Hazardous event affecting SAFETY SYSTEM required for the current operating mode. 4 5 **Emergency Action Level (EAL):** **Note:** • This EAL is only applicable to SAFETY SYSTEMs having two (2) or more trains. • If the affected SAFETY SYSTEM train was already inoperable before the hazardous event occurred, then this emergency classification is not warranted. • If the hazardous event only resulted in VISIBLE DAMAGE, with no indications of degraded performance to at least one train of a SAFETY SYSTEM, then this emergency classification is not warranted. • If a hazardous event occurs and it is determined that the conditions of CA2 are not met then assess the event via HU3, HU4, or HU6. 1. a. The occurrence of **ANY** of the following hazardous events: • Seismic event (earthquake) • Internal or external flooding event • High winds or tornado strike • FIRE • EXPLOSION • Other events with similar hazard characteristics as determined by the Shift Manager **AND** b. Event damage has caused indications of degraded performance to one train of a SAFETY SYSTEM required by Technical Specifications for the current operating mode. **AND** c. **EITHER** of the following: • Event damage has caused indications of degraded performance to a second train of the SAFETY SYSTEM required by Technical Specifications for the current operating mode. **OR** • Event damage has resulted in VISIBLE DAMAGE to a second train of the SAFETY SYSTEM required by Technical Specifications for the current operating mode.	

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT

Cold Shutdown / Refueling System Malfunctions

DC Power

CU3 Loss of Vital DC power for 15 minutes or longer. 4 5

Emergency Action Level (EAL):

Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

Voltage is **< 105 VDC** on required 125 VDC battery buses #2 and #3 for **> 15 minutes**.

Communications

Table C1 Communications Capability

System	Onsite	Offsite	NRC
Plant Radio	X		
Plant Page	X		
All telephone Lines (Commercial and microwave)	X	X	X
ENS		X	X
HPN		X	X
Satellite Phones		X	X

CU4 Loss of all onsite or offsite communication capabilities. 4 5 D

Emergency Action Level (EAL):

1. Loss of **ALL** Table C1 **Onsite** communications capability affecting the ability to perform routine operations.

   OR

2. Loss of **ALL** Table C1 **Offsite** communication capability affecting the ability to perform offsite notifications.

   OR

3. Loss of **ALL** Table C1 **NRC** communication capability affecting the ability to perform NRC notifications.

Heat Sink

Table C2 RCS Heat-up Duration Thresholds

RCS Status	Containment Closure Status	Heat-up Duration
Intact	Not Applicable	60 minutes*
Not Intact	Established	20 minutes*
	Not Established	0 minutes

* If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced, then EAL Threshold #1 is **not** applicable.

CA5 Inability to maintain plant in cold shutdown 4 5

Emergency Action Levels (EAL):

Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

A momentary UNPLANNED excursion above the Technical Specification cold shutdown temperature limit when heat removal function is available does not warrant classification.

1. UNPLANNED rise in RCS temperature **> 212ºF** for **> Table C2 duration**.

   OR

2. UNPLANNED RPV pressure rise **> 10 psig** as a result of temperature rise.

CU5 UNPLANNED rise in RCS temperature. 4 5

Emergency Action Levels (EAL):

Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

A momentary UNPLANNED excursion above the Technical Specification cold shutdown temperature limit when heat removal function is available does not warrant classification.

1. UNPLANNED rise in RCS temperature **> 212ºF.**

   OR

2. Loss of the following for **> 15 minutes.**
   - **ALL** RCS temperature indications

     AND

   - **ALL** RPV level indications

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D - Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT

Cold Shutdown / Refueling System Malfunctions

RCS Leakage / Inventory

GENERAL EMERGENCY

CG6 Loss of RPV inventory affecting fuel clad integrity with containment challenged. 4 5

Emergency Action Level (EAL):

Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1 a. RPV Level **< -143 inches (TAF)** for **≥ 30 minutes.**

AND

b. Any Containment Challenge Indication (Table C4).

OR

2. a. RPV level **cannot** be determined for **≥ 30 minutes.**

AND

b. Core uncovery is indicated by **ANY** of the following:

- Table C3 indications of a sufficient magnitude to indicate core uncovery.

  OR

- Refuel Floor Hi Range ARM **>3000 mR/hr.**

AND

c. **ANY** Containment Challenge Indication (Table C4).

Table C4 Containment Challenge Indications
• Primary Containment Hydrogen Concentration **≥ 6%** and Oxygen **≥ 5%** • UNPLANNED rise in containment pressure • CONTAINMENT CLOSURE **not** established* • **ANY** Secondary Containment radiation monitor **> DEOP 300-1 Maximum Safe** operating level
* if CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute core uncovery time limit, then escalation to a General Emergency is not required.

SITE AREA EMERGENCY

CS6 Loss of RPV inventory affecting core decay heat removal capabilities. 4 5

Emergency Action Level (EAL):

Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1. With CONTAINMENT CLOSURE **not** established, RPV level **< -60 inches.**

OR

2. With CONTAINMENT CLOSURE established, RPV level **< - 143 inches (TAF).**

OR

3. a. RPV level **cannot** be determined for **≥ 30 minutes.**

AND

b. Core uncovery is indicated by **ANY** of the following:

- Table C3 indications of a sufficient magnitude to indicate core uncovery.
- **OR**
- Refuel Floor Hi Range ARM **>3000 mR/hr.**

Table C3 Indications of RCS Leakage
• UNPLANNED floor or equipment sump level rise* • UNPLANNED Torus level rise* • UNPLANNED vessel make up rate rise • Observation of leakage or inventory loss
*Rise in level is attributed to a loss of RPV inventory

ALERT

CA6 Loss of RPV inventory 4 5

Emergency Action Level (EAL):

Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1. Loss of RPV inventory as indicated by level **< - 54 inches.**

OR

2. a. RPV level **cannot** be determined for **≥ 15 minutes**.

AND

b. Loss of RPV inventory per Table C3 indications.

UNUSUAL EVENT

CU6 UNPLANNED loss of RPV inventory for 15 minutes or longer. 4 5

Emergency Action Level (EAL):

Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

1. UNPLANNED loss of reactor coolant results in the inability to restore and maintain RPV level to above the **procedurally established lower limit** for **≥ 15 minutes**.

OR

2. a. RPV level **cannot** be determined.

AND

b. Loss of RPV inventory per Table C3 indications.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety				
Hostile Action		**HS1** HOSTILE ACTION within the PROTECTED AREA 1 2 3 4 5 D **<u>Emergency Action Level (EAL):</u>** A notification from the Security Force that a HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA.	**HA1** HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes. 1 2 3 4 5 D **<u>Emergency Action Level (EAL):</u>** 1. A validated notification from NRC of an aircraft attack threat **< 30 minutes** from the site. **OR** 2. Notification by the Security Force that a HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLED AREA.	**HU1** Confirmed SECURITY CONDITION or threat. 1 2 3 4 5 D **<u>Emergency Action Level (EAL):</u>** 1. Notification of a credible security threat directed at the site as determined per SY-AA-101-132, Security Assessment and Response to Unusual Activities. **OR** 2. A validated notification from the NRC providing information of an aircraft threat. **OR** 3. Notification by the Security Force of a SECURITY CONDITION that does **<u>not</u>** involve a HOSTILE ACTION.
Transfer of Plant Control	**Table H1 Safety Functions** • Reactivity Control (ability to shut down the reactor and keep it shutdown) • RPV Water Level (ability to cool the core) • RCS Heat Removal (ability to maintain a heat sink)	**HS2** Inability to control a key safety function from outside the Control Room 1 2 3 4 5 D **<u>Emergency Action Level (EAL):</u>** **Note:** The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. 1. A Control Room evacuation has resulted in plant control being transferred from the Control Room to alternate locations per DSSP 0100-CR, Hot Shutdown Procedure – Control Room Evacuation. **AND** 2. Control of **ANY** Table H1 key safety function is **<u>not</u>** reestablished in **< 30 minutes**.	**HA2** Control Room evacuation resulting in transfer of plant control to alternate locations 1 2 3 4 5 D **<u>Emergency Action Level (EAL):</u>** A Control Room evacuation has resulted in plant control being transferred from the Control Room to alternate locations per DSSP 0100-CR, Hot Shutdown Procedure – Control Room Evacuation.	

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT

Hazards and Other conditions Affecting Plant Safety

Fire

Table H2 Vital Areas

- Reactor Building (when inerted the Drywell is exempt)
- Aux Electric Room
- Control Room
- Unit and Shared Emergency Diesel Generator Rooms
- 4KV ECCS Switchgear Area (includes Bus 23, 24, 33 and 34 only)
- CRD & CCSW Pump Rooms
- Turbine Building Cable Tunnel
- Turbine Building Safe Shutdown Areas as follows:
  - B- Train Control Room HVAC Room
  - Battery Rooms and DC Distribution Areas
    1) U2 Battery Room (includes DC switchgear, 125V, and 250V battery rooms)
    2) U3 Battery Room, Battery Cage area, and U3 Battery Charger Room (all on U3 TB 538)
- Crib House

HU3 FIRE potentially degrading the level of safety of the plant. 1 2 3 4 5 D

Emergency Action Level (EAL):

Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.

Escalation of the emergency classification level would be via IC CA2 or MA5

1. A FIRE in **ANY** Table H2 area is **not** extinguished in **< 15-minutes** of **ANY** of the following FIRE detection indications:
   - Report from the field (i.e., visual observation).
   - Receipt of multiple (more than 1) fire alarms or indications.
   - Field verification of a single fire alarm.

   OR
2. a. Receipt of a single fire alarm in **ANY** Table H2 area (i.e., no other indications of a FIRE).

   AND

   b. The existence of a FIRE is **not** verified in **< 30 minutes** of alarm receipt.

   OR
3. A FIRE within the plant PROTECTED AREA not extinguished in **< 60-minutes** of the initial report, alarm or indication.

   OR
4. A FIRE within the plant PROTECTED AREA that requires firefighting support by an offsite fire response agency to extinguish.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety				
Earthquake				**HU4** Seismic event greater than OBE levels 1 2 3 4 5 D **Emergency Action Level (EAL):** **Note**: Escalation of the emergency classification level would be via IC CA2 or MA5 For emergency classification if EAL 2 is not able to be confirmed, then the occurrence of a seismic event is confirmed in manner deemed appropriate by the Shift Manager or Emergency Director in **≤ 15 mins** of the event. Seismic event as indicated by: 1. Control Room personnel feel an actual or potential seismic event. **AND** 2. **ANY** one of the following confirmed in **≤ 15 mins** of the event: • The earthquake resulted in Modified Mercalli Intensity (MMI) **≥ VI** and occurred **≤ 3.5 miles** of the plant. • The earthquake was magnitude **≥ 6.0.** • The earthquake was magnitude **≥ 5.0** and occurred **≤ 125 miles** of the plant.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D - Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT

Hazards and Other conditions Affecting Plant Safety

Toxic Gas

HA5 Gaseous release impeding access to equipment necessary for normal plant operations, cooldown or shutdown. 3 4 5

Emergency Action Level (EAL):

Note: If the equipment in the listed room or area was already inoperable, or out of service, before the event occurred, then no emergency classification is warranted.

1. Release of a toxic, corrosive, asphyxiant or flammable gas in a Table H3 area.

AND

2. Entry into the room or area is prohibited or impeded.

Table H3
Areas with Entry Related Mode Applicability

Area	Unit	Entry Related Mode Applicability
Reactor Building 517' elevation • MCC 28-1 area • MCC 29-1 area • MCC 38-1 area • MCC 39-1 area • CRD 25 valve area 545' elevation • Bus 23-1 area • Bus 24-1 area • Bus 33-1 area • Bus 34-1 area • RWCU Pump Room 570' elevation • 250VDC MCC 2A area • 250VDC MCC 2B area • 250VDC MCC 3A area • 250VDC MCC 3B area 589' elevation • Isolation Condenser Floor	2(3)	Modes 3, 4, and 5
Cribhouse	2&3	
Turbine Building **495' elevation** • CRD Pump Area	2(3)	
534' elevation • Bus 23 area • Bus 24 area	2	
538' elevation • Bus 33 area • Bus 34 area	3	

Hazardous Event

HU6 Hazardous Event 1 2 3 4 5 D

Emergency Action Level (EAL):

Note: EAL #4 does not apply to routine traffic impediments such as fog, snow, ice, or vehicle breakdowns or accidents.

Escalation of the emergency classification level would be via IC CA2 or MA5

1. Tornado strike within the PROTECTED AREA.
OR
2. Internal room or area flooding of a magnitude sufficient to require manual or automatic electrical isolation of a SAFETY SYSTEM component required by technical Specifications for the current operating mode.
OR
3. Movement of personnel within the PROTECTED AREA is impeded due to an offsite event involving hazardous materials (e.g., an offsite chemical spill or toxic gas release).
OR
4. A hazardous event that results in on-site conditions sufficient to prohibit the plant staff from accessing the site via personal vehicles.
OR
5. Abnormal River level, as indicated by **EITHER**:
   a. High river level **> 510 ft. 4 inches.**
   OR
   b. Low river level **< 501 ft. 6 inches.**

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D - Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other conditions Affecting Plant Safety				
Emergency Director Judgment	**HG7** Other conditions exist which in the judgment of the Emergency Director warrant declaration of a GENERAL EMERGENCY. 1 2 3 4 5 D **Emergency Action Level (EAL):** Other conditions exist which in the judgment of the Emergency Director 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 offsite for more than the immediate site area.	**HS7** Other conditions exist which in the judgment of the Emergency Director warrant declaration of a SITE AREA EMERGENCY. 1 2 3 4 5 D **Emergency Action Level (EAL):** Other conditions exist which in the judgment of the Emergency Director 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.	**HA7** Other conditions exist which in the judgment of the Emergency Director warrant declaration of an ALERT. 1 2 3 4 5 D **Emergency Action Level (EAL):** Other conditions exist which, in the judgment of the Emergency Director, 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.	**HU7** Other conditions exist which in the judgment of the Emergency Director warrant declaration of an UNUSUAL EVENT. 1 2 3 4 5 D **Emergency Action Level (EAL):** Other conditions exist which in the judgment of the Emergency Director 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.

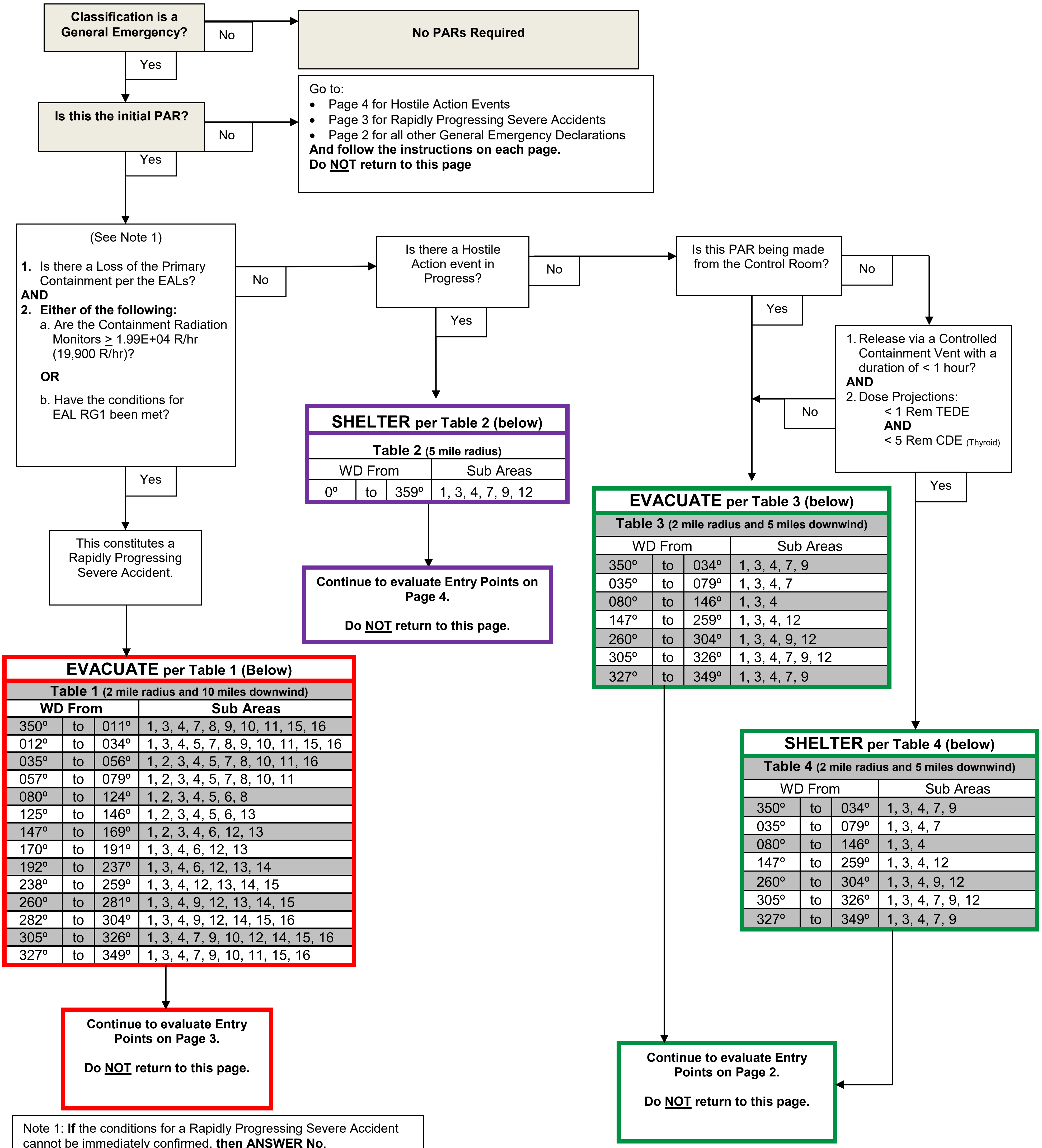
Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D – Defueled

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
ISFSI Malfunction				
ISFSI				**E-HU1** Damage to a loaded cask CONFINEMENT BOUNDARY. 1 2 3 4 5 D **Emergency Action Level (EAL):** Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading: 1. EAST HI-STAR • **> 160 mrem/hr** (neutron + gamma) on the top of the Overpack. **OR** • **> 250 mrem/hr** (neutron+ gamma) on the side of the Overpack. **OR** 2. EAST HI-STORM • **> 20 mrem/hr** (neutron+ gamma) on the top of the Overpack. **OR** • **> 100 mrem/hr** (neutron+ gamma) on the side of the Overpack. **OR** • **> 90 mrem/hr** (neutron+ gamma) at the inlet and outlet vent ducts of the Overpack. **OR** 3. WEST HI-STORM (labeled as xxx-A2) • **> 40 mrem/hr** (neutron+ gamma) on the top of the Overpack. **OR** • **> 220 mrem/hr** (neutron+ gamma) on the side of the Overpack, excluding inlet and outlet ducts. **OR** 4. WEST HI-STORM (labeled as xxx-A8) • **> 60 mrem/hr** (neutron+ gamma) on the top of the Overpack. **OR** • **> 600 mrem/hr** (neutron+ gamma) on the side of the Overpack, excluding inlet and outlet ducts.

Modes: 1 – Power Operation 2 – Startup 3 – Hot Shutdown 4 – Cold Shutdown 5 – Refueling D - Defueled

Dresden PAR Flowchart

Page 1
Initial Protective Action Recommendation ONLY



Classification is a General Emergency?
No → **No PARs Required**
Yes ↓

Is this the initial PAR?
No →
Go to:
- Page 4 for Hostile Action Events
- Page 3 for Rapidly Progressing Severe Accidents
- Page 2 for all other General Emergency Declarations

And follow the instructions on each page.
Do NOT return to this page

Yes ↓

(See Note 1)

1. Is there a Loss of the Primary Containment per the EALs?

AND

2. **Either of the following:**
   a. Are the Containment Radiation Monitors ≥ 1.99E+04 R/hr (19,900 R/hr)?
   OR
   b. Have the conditions for EAL RG1 been met?

Yes ↓
This constitutes a Rapidly Progressing Severe Accident.

EVACUATE per Table 1 (Below)

Table 1 (2 mile radius and 10 miles downwind)

WD From			Sub Areas
350°	to	011°	1, 3, 4, 7, 8, 9, 10, 11, 15, 16
012°	to	034°	1, 3, 4, 5, 7, 8, 9, 10, 11, 15, 16
035°	to	056°	1, 2, 3, 4, 5, 7, 8, 10, 11, 16
057°	to	079°	1, 2, 3, 4, 5, 7, 8, 10, 11
080°	to	124°	1, 2, 3, 4, 5, 6, 8
125°	to	146°	1, 2, 3, 4, 5, 6, 13
147°	to	169°	1, 2, 3, 4, 6, 12, 13
170°	to	191°	1, 3, 4, 6, 12, 13
192°	to	237°	1, 3, 4, 6, 12, 13, 14
238°	to	259°	1, 3, 4, 12, 13, 14, 15
260°	to	281°	1, 3, 4, 9, 12, 13, 14, 15
282°	to	304°	1, 3, 4, 9, 12, 14, 15, 16
305°	to	326°	1, 3, 4, 7, 9, 10, 12, 14, 15, 16
327°	to	349°	1, 3, 4, 7, 9, 10, 11, 15, 16

Continue to evaluate Entry Points on Page 3.

Do NOT return to this page.

No →
Is there a Hostile Action event in Progress?

Yes ↓

SHELTER per Table 2 (below)

Table 2 (5 mile radius)

WD From			Sub Areas
0°	to	359°	1, 3, 4, 7, 9, 12

Continue to evaluate Entry Points on Page 4.

Do NOT return to this page.

No →
Is this PAR being made from the Control Room?

Yes ↓

No →
1. Release via a Controlled Containment Vent with a duration of < 1 hour?

AND

2. Dose Projections:
   < 1 Rem TEDE
   AND
   < 5 Rem CDE (Thyroid)

No ←

EVACUATE per Table 3 (below)

Table 3 (2 mile radius and 5 miles downwind)

WD From			Sub Areas
350°	to	034°	1, 3, 4, 7, 9
035°	to	079°	1, 3, 4, 7
080°	to	146°	1, 3, 4
147°	to	259°	1, 3, 4, 12
260°	to	304°	1, 3, 4, 9, 12
305°	to	326°	1, 3, 4, 7, 9, 12
327°	to	349°	1, 3, 4, 7, 9

Yes ↓

SHELTER per Table 4 (below)

Table 4 (2 mile radius and 5 miles downwind)

WD From			Sub Areas
350°	to	034°	1, 3, 4, 7, 9
035°	to	079°	1, 3, 4, 7
080°	to	146°	1, 3, 4
147°	to	259°	1, 3, 4, 12
260°	to	304°	1, 3, 4, 9, 12
305°	to	326°	1, 3, 4, 7, 9, 12
327°	to	349°	1, 3, 4, 7, 9

Continue to evaluate Entry Points on Page 2.

Do NOT return to this page.

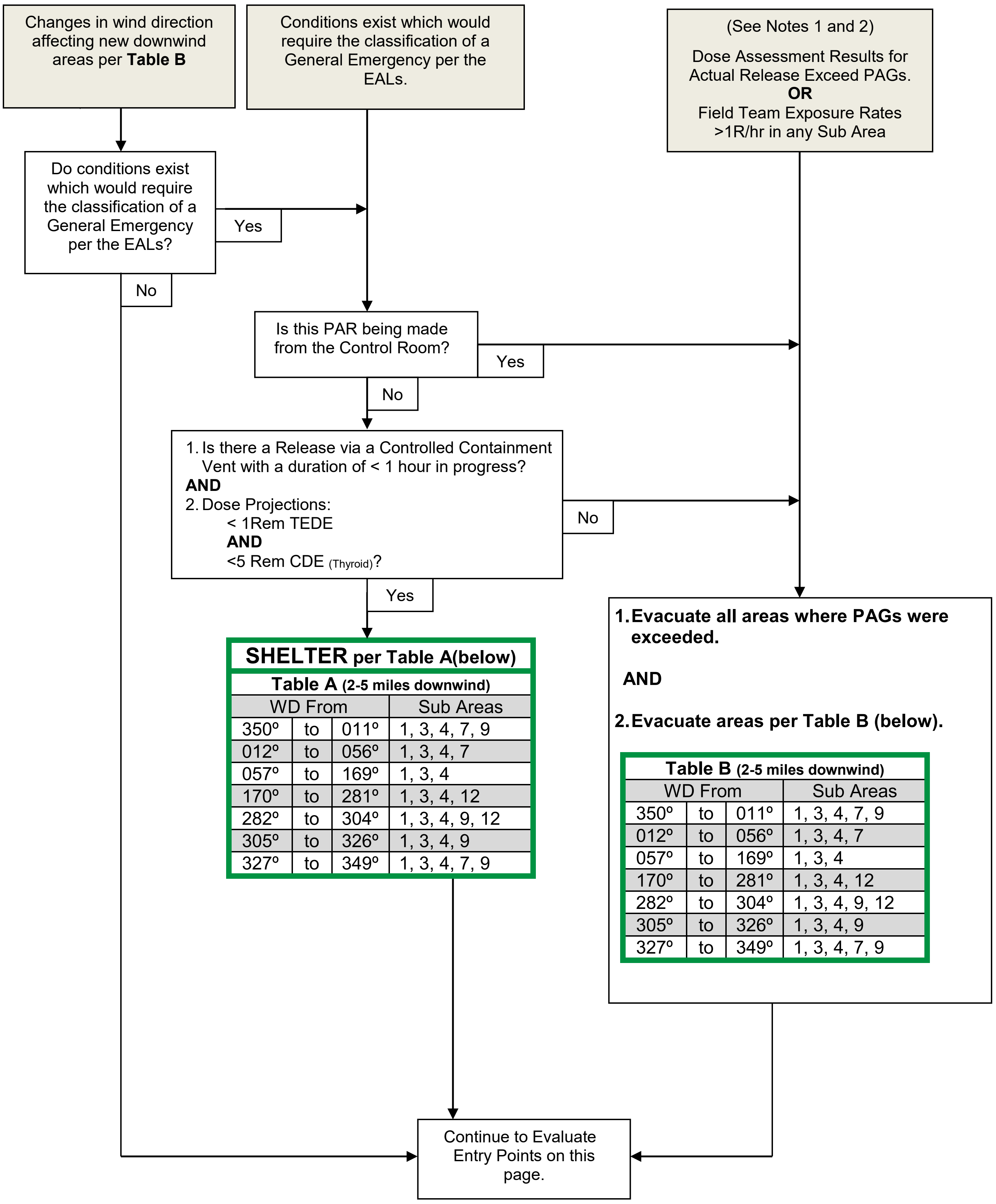
Note 1: **If** the conditions for a Rapidly Progressing Severe Accident cannot be immediately confirmed, **then ANSWER No**.

Note 2: If a radioactive release is occurring use applicable wind direction (ground level or elevated). Note 2 applies to initial and subsequent PARs.

RELEASE POINT	LEVEL
No Release	Elevated
Chimney	Elevated
Reactor Bldg. Vent	Ground
Isolation Condenser Dresden (Only)	Ground
Hole in Wall/Other	Ground
Multiple Release Points	Elevated

Dresden PAR Flowchart

Page 2
All Other General Emergencies



Changes in wind direction affecting new downwind areas per **Table B**

Conditions exist which would require the classification of a General Emergency per the EALs.

(See Notes 1 and 2)

Dose Assessment Results for Actual Release Exceed PAGs.
OR
Field Team Exposure Rates >1R/hr in any Sub Area

Do conditions exist which would require the classification of a General Emergency per the EALs?

Is this PAR being made from the Control Room?

1. Is there a Release via a Controlled Containment Vent with a duration of < 1 hour in progress?

AND

2. Dose Projections:
   < 1Rem TEDE
   AND
   <5 Rem CDE (Thyroid)?

SHELTER per Table A(below)

Table A (2-5 miles downwind)			
WD From			Sub Areas
350°	to	011°	1, 3, 4, 7, 9
012°	to	056°	1, 3, 4, 7
057°	to	169°	1, 3, 4
170°	to	281°	1, 3, 4, 12
282°	to	304°	1, 3, 4, 9, 12
305°	to	326°	1, 3, 4, 9
327°	to	349°	1, 3, 4, 7, 9

1. Evacuate all areas where PAGs were exceeded.

AND

2. Evacuate areas per Table B (below).

Table B (2-5 miles downwind)			
WD From			Sub Areas
350°	to	011°	1, 3, 4, 7, 9
012°	to	056°	1, 3, 4, 7
057°	to	169°	1, 3, 4
170°	to	281°	1, 3, 4, 12
282°	to	304°	1, 3, 4, 9, 12
305°	to	326°	1, 3, 4, 9
327°	to	349°	1, 3, 4, 7, 9

Continue to Evaluate Entry Points on this page.

Note 1: Any area > 1R/hr is considered to have exceeded PAGs
Note 2: For assessment results > 10 miles, see EP-AA-111

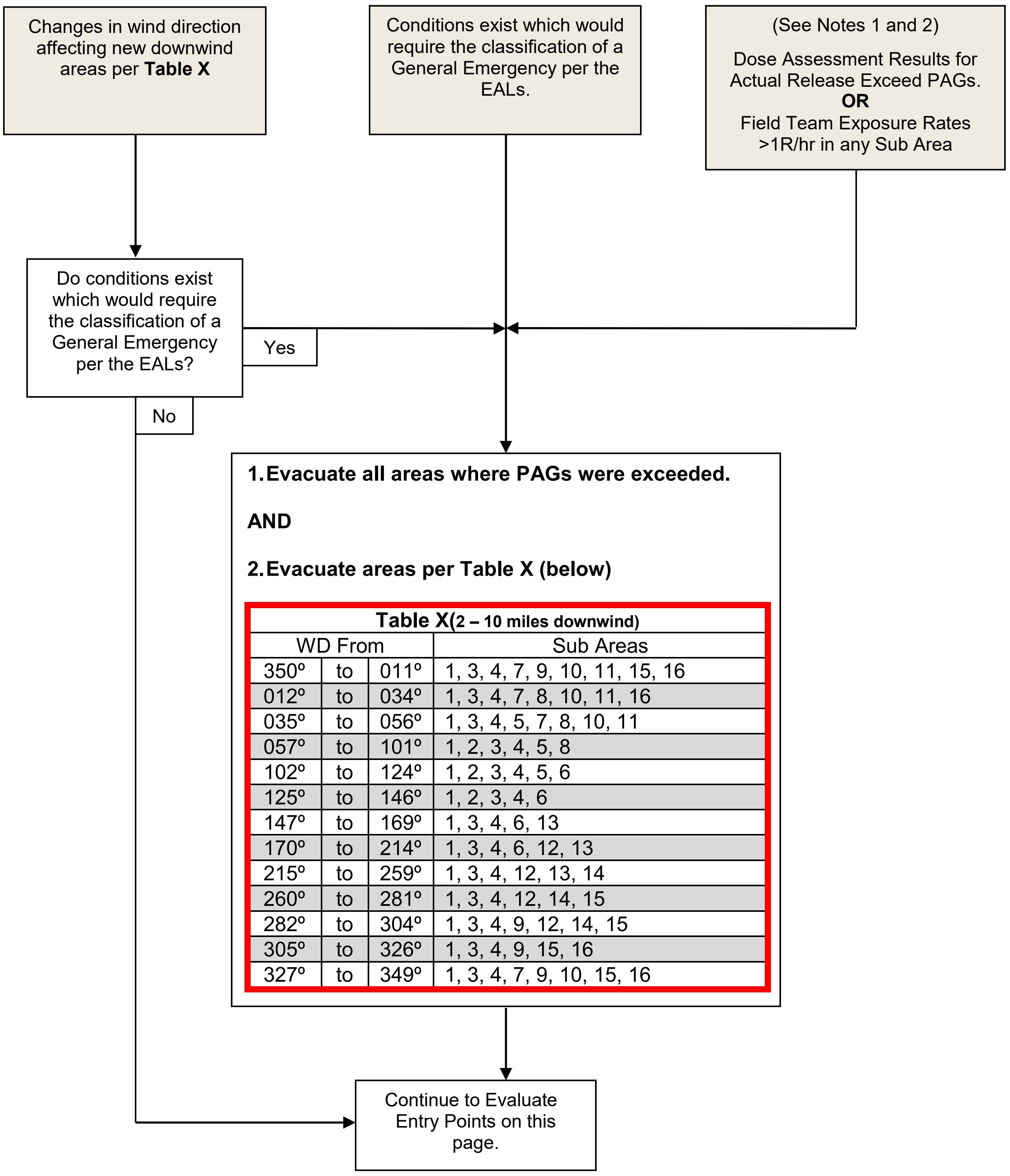
Note 3: If a radioactive release is occurring use applicable wind direction (ground level or elevated). Note 3 applies to initial and subsequent PARs.

RELEASE POINT	LEVEL
No Release	Elevated
Chimney	Elevated
Reactor Bldg. Vent	Ground
Isolation Condenser Dresden (Only)	Ground
Hole in Wall/Other	Ground
Multiple Release Points	Elevated

Dresden PAR Flowchart

Page 3

Rapidly Progressing Severe Accident ONLY



1. Evacuate all areas where PAGs were exceeded.

AND

2. Evacuate areas per Table X (below)

Table X(2 – 10 miles downwind)

WD From			Sub Areas
350°	to	011°	1, 3, 4, 7, 9, 10, 11, 15, 16
012°	to	034°	1, 3, 4, 7, 8, 10, 11, 16
035°	to	056°	1, 3, 4, 5, 7, 8, 10, 11
057°	to	101°	1, 2, 3, 4, 5, 8
102°	to	124°	1, 2, 3, 4, 5, 6
125°	to	146°	1, 2, 3, 4, 6
147°	to	169°	1, 3, 4, 6, 13
170°	to	214°	1, 3, 4, 6, 12, 13
215°	to	259°	1, 3, 4, 12, 13, 14
260°	to	281°	1, 3, 4, 12, 14, 15
282°	to	304°	1, 3, 4, 9, 12, 14, 15
305°	to	326°	1, 3, 4, 9, 15, 16
327°	to	349°	1, 3, 4, 7, 9, 10, 15, 16

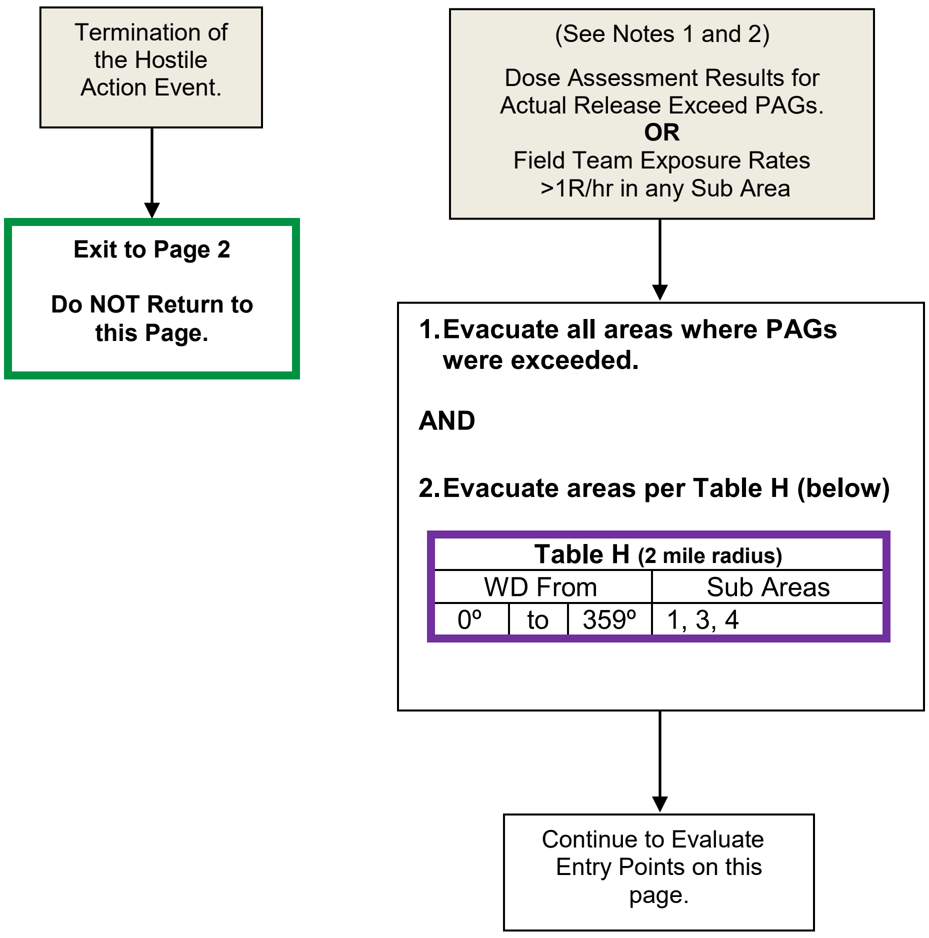
Note 1: Any area > 1R/hr is considered to have exceeded PAGs
Note 2: For assessment results > 10 miles, see EP-AA-111

Note 3: If a radioactive release is occurring use applicable wind direction (ground level or elevated). Note 3 applies to initial and subsequent PARs.

RELEASE POINT	**LEVEL**
No Release	Elevated
Chimney	Elevated
Reactor Bldg. Vent	Ground
Isolation Condenser Dresden (Only)	Ground
Hole in Wall/Other	Ground
Multiple Release Points	Elevated

Dresden PAR Flowchart

Page 4
Hostile Action ONLY



Termination of the Hostile Action Event.

Exit to Page 2

Do NOT Return to this Page.

(See Notes 1 and 2)

Dose Assessment Results for Actual Release Exceed PAGs.
OR
Field Team Exposure Rates >1R/hr in any Sub Area

1. **Evacuate all areas where PAGs were exceeded.**

AND

2. **Evacuate areas per Table H (below)**

Table H **(2 mile radius)**

WD From			Sub Areas
0º	to	359º	1, 3, 4

Continue to Evaluate Entry Points on this page.

Note 1: Any area > 1R/hr is considered to have exceeded PAGs
Note 2: For assessment results > 10 miles, see EP-AA-111