QUESTION NO. 76 For SRO Exam

The plant is operating in mode 1 at 100% of rated power. STP-053-3001 (Jet Pump Operability) has just been completed. Upon review of the STP the CRS has discovered that Jet Pump No. 7 is inoperable.

The CRS enters T.S. 3.4.3 Action A, requiring the plant to be in Hot Shutdown within 12 hours.

Which one of the following correctly describes the basis behind this required tech spec action?

A. A failed jet pump increases the probability of instability events at lower power levels during low flow conditions.

B. With a failed jet pump, neutron flux distribution across the core changes due to the change in core flow, thereby making the APRM indications unreliable.

C. A failed jet pump increases the blowdown area and reduces the capability of reflooding to two thirds (2/3) core height following a LOCA.

D. A failed jet pump causes the APRM Flow Biased scram and rod block setpoints to drift due to the increase or decrease in flow in the affected loop.

ANSWER: C

K/A
Statement: Knowledge of bases in technical specifications for limiting conditions for operations and safety limits applicable to Loss of Forced Core Circulation..

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
295001 2.2.25	**2.5**	**3.7**	**41.3** **43.2**	**TS Bases Page B 3.4-14**	**HLO-405** **OBJ- 1**

TIER/GROUP: **1/1**

LOK: **F** LOD: **2**

ORIGIN: **BANK**

HISTORY: **River Bend NRC Exam 2/2003**

BANK QID: **833**

QUESTION NO. 77 For SRO Exam

The plant was operating at rated power when a loss of offsite power occurred. Of the three Diesel Generators, only the HPCS Diesel Generator is operating.

Ten (10) minutes after the loss of power the following conditions exist:

- Post Accident Monitor recorders B21-R623A and B on P601 are indicating
  (1) RPV pressure is cycling between approximately 926 psig and 1064 psig
  (2) RPV level is 0 inches and slowly rising.
- SRV F051C is cycling open and closed.
- SRV F051D opened and remained open.

Which of the following abnormal and emergency procedures contain the appropriate action steps to mitigate the consequences of the conditions above?

A. AOP-0004, Loss of Offsite Power and EOP-0001, RPV Control.

B. AOP-0004, Loss of Offsite Power and EOP-0001A, RPV Control - ATWS.

C. AOP-0050, Station Blackout and EOP-0001, RPV Control.

D. AOP-0050, Station Blackout and EOP-0001A, RPV Control - ATWS.

ANSWER: D

A - With only HPCS Generator operating, conditions are considered SBO and one SRV open and one cycling indicates power >5% (ATWS condition)
B - With only HPCS Generator operating, conditions are considered SBO.
C - One SRV open and one cycling indicates power >5% (ATWS condition)

K/A
Statement: Ability to determine/interpret reactor power, pressure, and level as they apply to Partial or Complete Loss of AC Power.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
295003 A2.02	**4.2**	**4.3**	**43.5**	**AOP-0050, Step 1.1 & 2.1** **SOP-0004, Step 1.2** **EPSTG-0002, B-6-3**	**HLO-513** **OBJ- 3**

TIER/GROUP: **1/1**

LOK: **H** LOD: **3**

ORIGIN: **NEW**

HISTORY:

BANK QID: **217**

QUESTION NO. 78 For SRO Exam

The plant was operating at 100% power with RCIC inoperable, one day into a 14 day LCO. RCIC was expected to be repaired and returned to operable in three days.

A turbine trip and reactor scram occurs and NNS-SWG1A fails auto transfer leaving the bus de-energized. The Division III Diesel Generator started but had to be tripped and shutdown when a fire was discovered in the engine crankcase.

Four hours later it is estimated that it will take at least five days to return the Division III Diesel to service.

(Technical Specifications 3.8.1, 3.5.1 and 3.5.3 are included as EXAM HANDOUTS)

With the conditions above, what action, if any, is required by Technical Specifications?

A. No action is required as long as RCIC is returned to operable in three days.

B. Reduce steam dome pressure to less than or equal to 150 psig within 36 hours.

C. Place the plant in Mode 3 within 37 hours.

D. Immediately enter LCO 3.0.3.

ANSWER: B

HPCS must be declared INOP then 3.5.3 Action B.2 is required.

A. In Mode 3, RCIC and HPCS still required to be operable and HPCS must be declared INOP

C. Must be in Mode 3 in 12 hours.

D. Not in 3.0.3 because action for both HPCS and RCIC INOP is provided in 3.5

K/A
Statement: Ability to determine /interpret the electrical distribution status as it applies to Turbine Trip.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
295005 AA2.05	**3.2**	**3.3**	**43.2**	**TS 3.5.3 Action B.2**	**STM-209 OBJ- H17**

TIER/GROUP:

ORIGIN: **NEW**

HISTORY:

LOK: **H** LOD: **2**

BANK QID: **200**

QUESTION NO. 79 For SRO Exam

Following a refueling outage, a Xenon free reactor startup is in progress with RCS temperature at 130°F. The first five control rods have been fully withdrawn with no detectable change in SRM count rates. At this time, the operating CRD pump trips and the other CRD pump cannot be started. Several minutes later a RPV low water level scram at Level 3 occurs.

The ATC reports that none of the five withdrawn control rods inserted on the scram. All are still fully withdrawn. SRM count rates remain unchanged.

Which one of the following is the correct implementation of the EOPs for this situation?

A. No EOP entry is required, the reactor was never critical.

B. ONLY enter EOP-1, RPV Control, sufficient evidence exists that transitioning to EOP-1A, RPV Control - ATWS is unnecessary.

C. Enter EOP-1, RPV Control, transition to EOP-1A, RPV Control - ATWS, and remain in EOP-1A until Reactor Engineering concurs that the reactor was never critical.

D. Enter EOP-1, RPV Control, transition to EOP-1A, RPV Control - ATWS, and remain in EOP-1A until Reactor Engineering determines the reactor will remain shutdown.

ANSWER: D

A - Level 3 is EOP entry condition
B and C - RCS temperatures below minimum for critical could cause criticality unless RE determines otherwise.

K/A
Statement: Knowledge of the operational implications of reactivity control as it applies to scram.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
295006 AK1.03	**3.7**	**4**	**43.5** **43.6**	**EOP-0001** **EPSTG-0002, B-6-6**	**HLO-513** **OBJ- 3**

TIER/GROUP: **1/1**
ORIGIN: **NEW**
HISTORY:

LOK: **H** LOD: **3**

BANK QID: **814**

QUESTION NO. 80 For SRO Exam

The plant was operating at 100% power when one of the operating Normal Service Water (NSW) pumps, SWP-P7A tripped. The standby NSW pump, SWP-P7B failed to start. SWP-P7C continued to operate, but service water pressure in both divisional safety related loops dropped to 76 psig momentarily. Then, ONLY Division 2 Standby Service Water initiated.

Which of the following Abnormal Operating Procedures should be entered for this condition?

A. AOP-0016, Loss of Standby Service Water ONLY.

B. AOP-0053, Initiation of Standby Service Water and
AOP-0016, Loss of Standby Service Water.

C. AOP-0009, Loss of Normal Service Water and
AOP-0016, Loss of Standby Service Water.

D. AOP-0009, Loss of Normal Service Water and
AOP-0053, Initiation of Standby Service Water.

ANSWER: B

A - AOP-0053 also with one NSW pump running.
B - Not AOP-0009 which is for TOTAL loss of NSW.
C - Not AOP-0009 which is for TOTAL loss of NSW.

K/A
Statement: Ability to operate/monitor backup systems as they apply to Partial or Complete Loss of Component Cooling Water.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
295018 A1.01	**3.3**	**3.4**	**45.3**	**AOP-0016, Step 1.1** **AOP-0053, Step 1.1** **AOP-0009**	**STM-118 OBJ- H17**

TIER/GROUP: **1/1**

ORIGIN: **NEW**

HISTORY:

LOK: **H** LOD: **3**

BANK QID: **229**

QUESTION NO. 81 For SRO Exam

A plant startup to rated power is in progress. The plant is operating at 95% power and 95% of rated core flow when a failure of the air supply to the "A" Heater Drain Recirc controller results in a loss of feedwater heating and entry into AOP-0007.

The Reactor Engineer runs a Core Monitoring Case and reports that CMFLCPR is 1.002.

Tech Spec LCO 3.2.2 and the applicable COLR pages are included as EXAM HANDOUT MATERIAL.

Which one of the following describes the actions, if any, that are required for this condition?

A. No action is required.

B. Restore MCPR to within the limits within two (2) hours or reduce power to <23.8% within the next four (4) hours.

C. Restore MCPR to within the limits within two (2) hours or reduce power to <23.8% within the next two (2) hours.

D. Restore MCPR to within the limits and insert all insertable control rods within two (2) hours

ANSWER: B REQUIRES TS 3.2.2 AND COLR PAGES 25 & 30 INCLUDED AS EXAM HANDOUTS

A - Exceeded LCO when CMFLCPR is greater than 1.0 requiring action.
C - The four hours to reduce power is in addition to the two hours to restore to within limits.
D - Using COLR limiting value of MCPRp at 1.2 and CMFLCPR value of 1.002, measured MCPR is:
MCPR = MCPRp/CMFLCPR = 1.21/1.002 = 1.207 which does not violate SL.

K/A Statement: Ability to recognize indications for system operating parameters which are entry-level conditions fo technical specifications.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
295019 2.1.33	**3.4**	**4**	**43.2**	**COLR Pages 25 & 30 TS 3.2.2**	**STM-011 OBJ- 11**

TIER/GROUP: **1/1**

LOK: **H** LOD: **2**

ORIGIN: **MODIFIED**

HISTORY: **River Bend NRC Exam 10/2000**

BANK QID: **815**

QUESTION NO. 82 For SRO Exam

The plant is performing the In-Service Pressure Test (Vessel Hydro) on the reactor following refueling operations. A miscommunication results in a significant rise in reactor pressure. The following RPV pressure indications were observed in the Main Control Room:

- Wide range Reactor Pressure C33-R605 on P680 went offscale high (>1200 psig).
- Post Accident recorders B21-R623A and B on P601 indicated RPV pressure had reached 1350 psig.

Which one of the following is a correct assessment of this condition regarding the RBS Technical Specifications and any required reporting?

A. The TS Safety Limit for reactor pressure was exceeded and the NRC Operations Center must be notified within 1 hour.

B. The TS Safety Limit for reactor pressure was exceeded and the NRC Operations Center must be notified within 24 hours.

C. Only the TS LCO for Reactor Steam Dome Pressure must be entered and NO reporting is required.

D. NO TS Safety Limits or LCOs were violated and NO reporting is required.

ANSWER: A

B - Reporting time for Plant Manager and VP following SL violation.
C - Pressure exceeded 1075 psig, but LCO is only applicable in Modes 1 and 2.
D - SL violation with dome pressure on PAM recorders >1325 psig.

K/A
Statement: Knowledge of which events related to system operations/status that should be reported to outside agencies as it applies to High Reactor Pressure.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF	
295025 2.4.30		**3.6**	**43.2**	**RBS TS Page 2.0-1**	**HLO-219**	**OBJ- 1**

TIER/GROUP: **1/1** LOK: **F** LOD: **2**

ORIGIN: **MODIFIED**

HISTORY: **River Bend NRC Exam 2/1999** BANK QID: **931**

QUESTION NO. 83 For SRO Exam

With the plant operating at 100% power, the following sequence of events and actions have occurred at the times specified.

- 1020 Large Break LOCA in the Drywell and the reactor scrammed.
- 1030 EOP-0004, RPV Flooding was entered due to high Drywell temperature and RPV pressure at 5 psig
- 1031 6 SRVs were opened and remain open
- 1036 Injection sources for RPV Flooding raised RPV pressure above 42 psig and Drywell temperatures were lowering.

Assuming RPV pressure is maintained above 42 psig until the Minimum Core Flooding Interval is achieved, what are the times for the Minimum Core Flooding Interval (MCFI) and the Maximum Core Uncovery Time Limit (MCUTL)?

(EOP Figure 3 and Table 1 included as EXAM HANDOUTS.)

	MCFI	MCTUL
A.	46 min.	2.8 min.
B.	46 min.	3.4 min.
C.	64 min.	3.4 min.
D.	64 min.	4.5 min.

ANSWER: C

REQUIRES EOP FIGURE 3 AND TABLE 1

A - Incorrect MCFI (for 7 SRVs open) and MCUTL was determined using MCFI instead of time after Shutdown

B - Incorrect MCFI, (for 7 SRVs open)

D - Correct MCFI but miscalulated time after shutdown making MCUTL too high.

K/A
Statement: Ability to perform specific system and integrated plant procedures during different modes of plant operation as applicable to High Drywell Temperature.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF	
295028 2.1.23		**4**	**43.5**	**EOP-0004, RF-10 & RF-12**	**HLO-512**	**OBJ- 7**

TIER/GROUP: **1/1**

LOK: **H** LOD: **3**

ORIGIN: **NEW**

HISTORY:

BANK QID: **932**

QUESTION NO. 84 For SRO Exam

The CRVICS logic for a full MSIV closure and Inboard Balance of Plant isolation was inadvertently actuated with the plant at 100% power. All isolation valves and dampers closed as expected and an automatic reactor scram occurred from the MSIV closure.

Fifteen minutes later, Suppression Pool level has lowered to 18.5 feet and Containment pressure has risen to 5 psig.

Which of the following would be the reason for the containment pressure and any required actions? (EOP Figure 4, Pressure Suppression Pressure included as EXAM HANDOUT.)

A. Loss of containment cooling requiring normal containment venting

B. Loss of containment cooling requiring emergency containment venting

C. Excessive Post-LOCA drywell bypass leakage requiring emergency containment venting

D. Excessive Post-LOCA Drywell bypass leakage requiring Emergency Depressurization

ANSWER: D
ED required due to being in unsafe region of PSP curve.
A - Pressure too high for just loss of containment cooling and prohibits normal containment venting
B - Pressure too high for just loss of containment cooling and emergency venting not required (C)
C - Emergency containment venting is not required until pressure is approaching 30 psig.

K/A
Statement: Knowledge of the reasons for Drywell/containment pressure response as they apply to Inadvertent Containment Isolation.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
295020 AK3.02		**3.5**	**41.9 43.5**	**EOP-0002, CP-4 & Fig. 4**	**HLO-514 OBJ- 6**

TIER/GROUP: **1/2**
ORIGIN: **NEW**
HISTORY:

LOK: **H** LOD: **3**
BANK QID: **933**

QUESTION NO. 85 For SRO Exam

Given the following conditions

- RCIC tripped and Isolation Valves E51-F063, E51-F064 failed to close.
- RCIC Equipment Room Area Radiation: 1.2 E+04 mr/hr
- RCIC Equipment Room Area Temperature: 207°F

Which of the following is the bases for initiating a Reactor Scram with the above conditions?

EOP-0003 included as EXAM HANDOUT.

A. The scram will begin to reduce the energy that the RPV will discharge to the RCIC room to that of decay heat.

B. Emergency Depressurization is required.

C. Failure of Secondary Containment due to high temperatures must be assumed and the scram will stop the radioactive release.

D. A scram will immediately significantly reduce the driving head and flow through the break in the RCIC room.

ANSWER: A
REQUIRES EOP-0003 AS EXAM HANDOUT MATERIAL
B - Correct for EOP-3 SC-21
C - Secondary Containment is not assumed to have failed at this point.
D - Correct for EOP-3 SC-21, The Scram in itself will not significantly decrease driving head until RPV pressure is lowered.

K/A
Statement: Knowledge of the reasons for reactor SCRAM as they apply to High Secondary Containment Area Temperature.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF	
295032 EK3.02		**3.8**	**43.5**	**EPSTG-0002, Page B-9-13**	**HLO-515**	**OBJ- 4**

TIER/GROUP: **1/2**
ORIGIN: **NEW**
HISTORY:

LOK: **F** LOD: **3**

BANK QID: **934**

QUESTION NO. 86 For SRO Exam

During plant operation at rated power, the ANNULUS PRESSURE HIGH alarm on P863 is received. The following parameter values exist:

- Outside air temperature is 81°F
- Annulus air temperature is 85°F
- Annulus pressure on LMS-TR127 reads -2.9 inches water column
- Auxiliary building pressure on HVR-PDI247 reads -0.25 inches water column

The ARP for ANNULUS PRESSURE HIGH, applicable pages of STP-000-0001 and Technical Specifications are included as EXAM HANDOUT MATERIAL.

Given the conditions above determine if Annulus pressure is within Technical Specification limits and if EOP-0003 entry is required.

A. NEITHER EOP-0003 NOR TS LCO entry is required.

B. EOP-0003 entry IS NOT required, TS LCO entry IS required.

C. EOP-0003 entry IS required, TS LCO entry IS NOT required.

D. BOTH EOP-0003 and TS LCO entry ARE required.

ANSWER: A REQUIRES ARP-P863-72A-A01, STP-000-001, PAGES 16 & 33, AND TS 3.4.6.1 AS EXAM HANDOUT MATERIALS
Based on the corrected value being in acceptable side of STP-000-0001, Page 33 curve.
B - While Annulus pressure value of -2.9" WC is less than LCO limit of ≥3.0 inches vacuum, when corrected to 3.15 it is acceptable. Correction to make annulus pressure relative to atmospheric.
C - EOP-0003 matches TS in that it is Annulus pressure relative to atmospheric
D - See B & C

K/A Statement: Ability to determine/interpret secondary containment pressure as it applies to Secondary Containment High Differential Pressure.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
295035 EA2.01		**3.9**	**43.5**	**ARP-P863-72A-A01** **STP-000-0001, Pages 16 & 33** **TS 3.6.4.1**	**STM-403 OBJ- H10**
TIER/GROUP: **1/2**				**EOP-0003, Entry Conditions**	LOK: **H** LOD: **3**
ORIGIN: **NEW**					
HISTORY:					BANK QID: **950**

QUESTION NO. 87 For SRO Exam

Complete the following statement, regarding the Containment Hydrogen Deflagration Overpressure Limit (HDOL) curve in the EOPs.

As containment pressure rises, . . .

A. the maximum allowed hydrogen concentration lowers due to the reduced capability of the Hydrogen Recombiners at higher containment pressure.

B. the maximum allowed hydrogen concentration lowers because the deflagration pressure of hydrogen lowers.

C. the maximum allowed hydrogen concentration rises because it takes a higher concentration of hydrogen to burn at higher pressures.

D. the maximum allowed hydrogen concentration lowers to ensure that a hydrogen deflagration at the limit combined with current pressure will not exceed containtment overpressure failure limits.

ANSWER: D

K/A
Statement: Ability to determine/interpret combustible limits for wetwell as they apply to High Primary Containment Hydrogen Concentrations.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
500000 EA2.04	**3.3**	**3.3**	**43.5**	**EPSTG-0002, App. A EOP-1 Figure 5**	**HLO-514 OBJ- 8**

TIER/GROUP: **1/2**
LOK: **H** LOD: **2**
ORIGIN: **BANK**
HISTORY: **River Bend NRC Exam 10/2000**
BANK QID: **674**

QUESTION NO. 88 For SRO Exam

RHR A has just been placed in Shutdown Cooling Mode following a plant shutdown for a refuel outage.

During the outage, which one of the following changes in the status of Shutdown Cooling REQUIRES Duty Manager notification?

A. Adjusting the cooldown rate of the operating shutdown cooling loop by closing the RHR Heat Exchanger Bypass Valve.

B. Shifting shutdown cooling from RHR A to RHR B loops in order to conduct scheduled outage maintenance on Division 1 equipment.

C. Placing RHR B in service for shutdown cooling due to a trip of the RHR A pump.

D. Removing RHR A from shutdown cooling in preparation for a reactor startup after the refueling outage.

ANSWER: C

AOP entry (AOP-0051 for Loss of Decay Heat Removal) requires Duty Manager Notification
A - Normal system adjustment for shutdown cooling ops.
B - Planned evolution during an outage.
D - Planned evolution in preparation for mode change.

K/A
Statement: Knowledge of Shutdown Cooling system status criteria which require the notification of plant personnel.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
205000 2.1.14		**3.3**	**43.5**	**OSP-0046, Page 8**	**HLO-206 OBJ-**

TIER/GROUP: **2/1**
ORIGIN: **NEW**
HISTORY:

LOK: **F** LOD: **2**

BANK QID: **936**

QUESTION NO. 89 For SRO Exam

The plant is operating at 85% power. The Manual Scram Pushbutton Surveillance is being performed. After arming and depressing the last Manual Scram Pushbutton for DIV 4, the half scram is reset. However, a failure of the K14D relay contacts to reclose when re-energized results in the "B" RPS DIV 4 SCRAM SOV VALVES OPEN light above the DIV 4 Manual Scram Pushbutton on P680 remaining out. All other RPS scram solenoid valve white lights on P680 are lit.

If a loss of RPS Bus A occurs at this time, which one of the following is the expected response and appropriate action to be taken?

A. None of the control rods will scram. Transfer RPS Bus A to Alternate power per AOP-0010, Loss of RPS Bus.

B. Approximately ¼ of the control rods will scram. Manually scram the reactor and enter AOP-0001 and AOP-0010.

C. Approximately ¼ of the control rods will scram. Transfer RPS Bus A to Alternate power per AOP-0010, Loss of RPS Bus.

D. All of the control rods will scram. Manually scram the reactor and enter AOP-0001 and AOP-0010.

ANSWER: B

Manual Scram to close SDV vent and drain valves and prevent fuel damage.
A - ¼ of the control rods will scram due to both scram pilot valve solenoids being de-energized.
C - SDV vent and drain valves may be open with ¼ of control rods scrammed.
D - Only ¼ of the control rods will scram.

K/A
Statement: Ability to predict the impacts of the failure of individual relays to reposition on RPS; and use procedures to correct, control, or mitigate.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
212000 A2.21		**3.9**	**43.5** **43.6**	**STM-508, Figures 7 & 16** **STM-508, Page 22**	**STM-508 OBJ- H8**

TIER/GROUP: **2/1**
LOK: **H** LOD: **3**
ORIGIN: **NEW**
HISTORY:
BANK QID: **937**

QUESTION NO. 90 For SRO Exam

The plant is operating at 100% power with no LCOs. With the Division III Battery Charger tagged out for maintenance, the Backup Battery Charger, BYS-CHGR1D, is connected to the Div III 125 VDC switchgear, E22-PNLS001.

Based on the above conditions, Technical Specification LCO 3.8.4 entry . . .

(Technical Specification 3.8.4 is included as EXAM HANDOUT material.)

A. IS REQUIRED because the Backup Charger IS NOT capable of maintaining the Div. III battery parameters within surveillance requirements.

B. IS REQUIRED because the Backup Charger IS NOT a safety related charger.

C. IS NOT REQUIRED as long as the Backup Charger CAN maintain the Div. III battery parameters within surveillance requirements.

D. IS NOT REQUIRED because the Backup Charger IS a safety related charger.

ANSWER: B

A - Can maintain parameters but is not safety related and cannot be used to meet 3.8.4.
C - Must enter even with surveillance reqirements met.
D - Must enter because it is NOT safety related.

K/A
Statement: Ability to explain and apply D. C. Electrical Distribution system limits and precautions.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
263000 2.1.32		**3.8**	**43.2**	**TS 3.8.4** **SOP-0049, P&L 2.5**	**STM-305 OBJ- H7**

TIER/GROUP: **2/1**
ORIGIN: **NEW**
HISTORY:

LOK: **H** LOD: **3**

BANK QID: **946**

QUESTION NO. 91 For SRO Exam

The plant is operating at 100% power with Standby Service Water Pump, SWP-P2A, inoperable since 0800 this morning. At 1200 while being load tested in parallel with offsite power, the Division III (HPCS) Diesel Generator tripped due to a failure of the governor. The governor failure caused the an exessive load on the generator and subsequent output breaker trip.

Assuming all efforts to repair SWP-P2A and the Division III Diesel governor are unsuccessful, when must the plant be in MODE 3?

(Technical Specifications 3.7.1 and 3.8.1 are included as EXAM HANDOUTS)

A. 30 days + 12 hours from 0800 this morning.

B. 72 hours from 1200 today.

C. 17 days + 12 hours from 1200 today.

D. 84 hours from 1200 today.

ANSWER: D

A -
B -
C -

K/A
Statement: Ability to predict the impacts of operating unloaded, lightly loaded, and highly loaded on the EDGs; and use procedures to correct, control, or mitigate.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
264000 A2.03		**3.4**	**CFR**	**AOP-0003** **AOP-0001** **ADM-0022**	**STM-309S OBJ- H7**

TIER/GROUP: **2/1**

ORIGIN: **NEW**

HISTORY:

LOK: **H** LOD: **2**

BANK QID: **232**

QUESTION NO. 92 For SRO Exam

Given the following initial conditions for the Inclined Fuel Transfer (IFTS) System:

- IFTS Tube is full
- Upper upender inclined
- Carriage at upper terminal
- Lower upender inclined
- System powered up and neither bridge in the IFTS area

SELECT the correct statement regarding IFTS operation.

A. The transfer tube can be drained.

B. The refueling bridge can enter the IFTS area.

C. The fuel handling bridge can enter the IFTS area in the Fuel Building.

D. The winch can be lowered using the "lower" pushbutton on the upper control panel.

ANSWER: D

K/A
Statement: Ability to monitor automatic operations of Fuel Handling Equipment including interlock operation.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
234000 A3.02	**3.1**	**3.7**	**41.4** **41.6** **43.7**	**STM-055, Pages 12 & 37**	**STM-055 OBJ- H4**

TIER/GROUP: **2/2**

LOK: **H** LOD: **3**

ORIGIN: **MODIFIED**

HISTORY: **River Bend NRC Exam 2/2003**

BANK QID: **882**

QUESTION NO. 93 For SRO Exam

During a refueling outage, an irradiated fuel bundle is being moved from the Reactor to the Dryer Storage Pool. The fuel bundle's lifting bail fails and the bundle falls into the reactor vessel between the vessel wall and the shroud (downcomer area) on the Northeast side of the Reactor Vessel. It appears that bundle integrity is maintained as NO BUBBLES are rising to the surface of the Reactor Cavity.

Personnel working in which one of the following locations would run the highest risk of overexposure due to hig radiation levels?

A. The Drywell.

B. The Refuel floor.

C. The Containment.

D. The Steam Tunnel.

ANSWER: A
Only shielded by RPV wall.
B - Shielded by depth of water in RPV and Refuel Cavity
C - Shielded by Drywell wall.
D - Shielded by RPV water based on location of bundle and Drywell wall.

K/A
Statement: Knowledge of the effect a loss or malfunction of the Reactor Vessel Internals will have on plant radiation levels.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
290002 K3.04		**3.2**	**43.4** **43.6** **43.7**	**AOP-0027, Page 4**	**HLO-535** **OBJ- 5**

TIER/GROUP: **2/2**
LOK: **H** LOD: **2**
ORIGIN: **MODIFIED**
HISTORY: **FitzPatrick NRC 7/2003 (INPO 25621)**
BANK QID: **940**

QUESTION NO. 94 For SRO Exam

During an Emergency, the CRS determines that the only action appropriate to maintain the plant in a safe condition will NOT be in compliance with the station's operating license.

Whose permission, at a MINIMUM, is required to take that action and when must the NRC be notified?

A. Licensed Senior Reactor Operator (SRO); notify the NRC within one (1) hour

B. General Manager-Operations; notify the NRC within four (4) hours

C. Licensed Senior Reactor Operator (SRO); notify the NRC within four (4) hours

D. Site Duty Manager; notify the NRC within four (4) hours

ANSWER: A

K/A
Statement: Knowledge of conduct of operations requirements.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
2.1.1	**3.7**	**3.8**	**43.3** **43.1**	**LI-108 REAP, RAF 1.5**	**HLO-206** **OBJ- 6**

TIER/GROUP: **3**

LOK: **F** LOD: **2**

ORIGIN: **BANK**

HISTORY: **River Bend Audit Exam 1/2003**

BANK QID: **1063**

QUESTION NO. 95 For SRO Exam

In implementing AOP-0031, "Shutdown From Outside The Main Control Room," after evacuation of the Control Room the Operations Shift Manager is required to report to the . . .

A. Div I Remote Shutdown Panel to assist the CRS in directing plant operations.

B. Div II Remote Shutdown Panel to provide oversite and support for the CRS.

C. Operations Support Center to coordinate support required by the CRS.

D. Technical Support Center to implement the EIPs as Emergency Director.

ANSWER: D

A - May report here initially but not required
B - CRS will be at Div I RSP not Div II and OSM is required to report to TSC.
C - Building Operators report to OSC and a designated OSC Manager coordinates support.

K/A
Statement: Knowledge of operator responsibilities during all modes of plant operation.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
2.1.2	**3**	**4**	**43.5** **41.10**	**AOP-0031, Page 5**	**HLO-537** **OBJ- 1**

TIER/GROUP: **3**

LOK: **F** LOD: **2**

ORIGIN: **MODIFIED**

HISTORY: **River Bend NRC Exam 1/1997**

BANK QID: **624**

QUESTION NO. 96 For SRO Exam

A proposed plant modification must always have prior approval from the NRC if . . .

A. it requires a 50.59 evaluation.

B. it involves a system described in the RBS USAR.

C. it involves a system included in the RBS Technical Specifications.

D. it results in a design basis limit for Primary Containment being altered.

ANSWER: D

A - This evaluation will determine if NRC approval is required
B - Must have a 50.59 evaluation but not necessarily NRC approval
C - Must have a 50.59 evaluation but not necessarily NRC approval

K/A
Statement: Knowledge of the process for making changes in the facility as described in the SAR.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
2.2.5	**1.6**	**2.7**	**43.3**	**10CFR50.59** **LI-101**	**HLO-200** **OBJ- 2**

TIER/GROUP: **3**

ORIGIN: **NEW**

HISTORY:

LOK: **F** LOD: **3**

BANK QID: **876**

QUESTION NO. 97 For SRO Exam

During Startup while in Mode 2 , Leakage Computer report contains the following:

- 0.37 gpm Unidentified Leakage
- 3.34 gpm Identified Leakage.

Which one of the following subsequent changes in leakage requires entry into the Technical Specification LCO for Reactor Coolant System Leakage?

Technical Specification 3.4.5 is included as EXAM HANDOUT MATERIAL.

A. Additional 2.1 gpm leakage into the Containment Building Floor Drain Sump in the next 24 hours

B. A leak from the E12-F0041B RHR Injection check valve bonnet seal inside the Drywell

C. Additional leakage of 26.66 gpm leakage into the Containment Building Equipment Drain Sump averaged over 12 hours

D. Additional 4.66 gpm leak into the Pedestal Floor Drain

ANSWER: D REQUIRES TS 3.4.5 INCLUDED IN EXAM HANDOUT MATERIAL.

A - Tech Spec 3.4.5.d only required in Mode 1
B - Bonnet Seal Leakage is exempt from Pressure Boundary Leakage
C - Required to be averaged over 24 hours.

K/A
Statement: Knowledge of limiting conditions for operations and safety limits.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
2.2.22	**3.4**	**4.1**	**41.3** **41.5**	**TS LCO 3.4.5**	**STM-207** **OBJ- H8**

TIER/GROUP: **3**

ORIGIN: **NEW**

HISTORY:

LOK: **H** LOD: **2**

BANK QID: **926**

QUESTION NO. 98 For SRO Exam

The plant is operating at 100% power.

The Control Room Supervisor has a tagout that requires independent verification.

The Operations Shift Manager should NOT grant a waiver for independent verification if the valves to be tagged are located . . .

A. in a locked high radiation area.

B. near the Main Turbine Control Valves.

C. inside the Containment in a contaminated area.

D. in the RWCU Pump Room.

ANSWER: C

K/A
Statement: Knowledge of 10CFR20 and related facility radiation control procedures.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
2.3.1	**2.6**	**3**	**43.4** **41.10**	**ADM-0076, Page 15**	**HLO-201** **OBJ- 12**

TIER/GROUP: **3**

LOK: **F** LOD: **2**

ORIGIN: **MODIFIED**

HISTORY: **River Bend NRC Exam 2/2003**

BANK QID: **632**

QUESTION NO. 99 For SRO Exam

Given the following conditions:

- The Main Control Room has been evacuated due to a fire.
- All AOP-0031 immediate operator actions are complete, however the shutdown status of the reactor could not be determined prior to evacuation.
- Control of the plant has been established at the Remote Shutdown Panel.
- Indications of an ATWS exist 12 minutes after evacuating the control room

Which one of the following describes the correct action to be taken by the CRS?

A. Carry out the actions of AOP-0031 (Shutdown From Outside the Main Control Room) ONLY.

B. Enter EOP-0001, then execute EOP-0001A, RPV Control - ATWS and continue to carry out the actions of AOP-0031.

C. Execute EOP-0001, RPV Control and continue to carry out the actions of AOP-0031.

D. Execute EOP-0001A, RPV Control and exit AOP-0031.

ANSWER: B

A - EOPs take priority over AOPs
C - Must transition to execute EOP-0001A with ATWS conditions present
D - Must enter EOP-0001A through EOP-0001 and should not exit AOP-0031.

K/A
Statement: Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF	
2.4.5	**2.9**	**3.6**	**43.5**	**EPSTG-0002, B-4-7**	**HLO-537**	**OBJ- 1**

TIER/GROUP: **3** LOK: **H** LOD: **2**

ORIGIN: **MODIFIED**

HISTORY: **River Bend NRC Exam 10/2000** BANK QID: **675**

QUESTION NO. 100 For SRO Exam

The reactor is shutdown with no injection subsystems or alternate injection subsystems running.

Given the following RPV level and pressure conditions, in which case is Emergency Depressurization REQUIRED? (EOP-0004, Sheets 1 and 2 included as EXAM HANDOUTS)

A. Level is -180 inches and slowly lowering,
Pressure is 400 psig and slowly rising.

B. Level is -190 inches and slowly lowering,
Pressure is 200 psig and slowly lowering.

C. Level is -190 inches and slowly lowering,
Pressure is 300 psig and slowly rising.

D. Level is -200 inches and slowly lowering,
Pressure is 450 psig and stable.

ANSWER: C
Rising pressure in Steam Cooling requires transition to Emergency Depressurization (STC-4 & 5)
A - Adequate core cooling exists with level above the MSCRWL (-186") regardless of trends. With no injection Emergency Depressurization is NOT REQUIRED
B - Same as D.
D - Expected condtions for steam cooling, Emergency Depressurization NOT REQUIRED till -202.

K/A
Statement: Knowledge of the parameters and logic used to assess the status of safety functions including … (2) Core cooling and heat removal …

K/A	RO	SRO	10 CFR 55	TECHNICAL REFs	OBJECTIVE REF
2.4.21	**4.6**	**4.3**	**43.5**	**EOP-0004, STC-4 and 5** **EPSTG-0002, Page 12-8**	**HLO-512** **OBJ- 7**

TIER/GROUP: **3**
LOK: **H** LOD: **3**
ORIGIN: **MODIFIED**
HISTORY: **River Bend NRC Exam 2/2003**
BANK QID: **370**

HANDOUT MATERIALS

for the September 17, 2004 River Bend NRC SRO Written Exam

For
SRO

Question 3

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)
BYS-PNL01	BYS-CHGR1C BYS-BAT1C	NNS-SWG2A/2B	DC control power to: SWP-P7A(B)(C) CWS-P1A(B)(C)(D) NNS-SWG2A/2B Tie
		CES-CAB2 Supv Panel	Power to Circ Water Harris Panel Supervisory Cabinet.
BYS-SWG01A	BYS-CHGR1A BKR 500 BYS-BAT01A1 BKR 501 BYS-BAT01A2 BKR 502	BYS-PNL02A1	See BYS-PNL02A1
		BYS-PNL02A2	See BYS-PNL02A2
		BYS-PNL03A	See BYS-PNL03A
		BYS-INV01A	DC power supply to inverter
		BYS-INV02, Plant Process Computer UPS	DC power supply to inverter
		TML-EBOP	Turbine Emergency Bearing Oil Pump Possible controlled turbine shutdown at discretion of Operations Superintendent

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)

BYS-PNL02A1	BYS-SWG01A Bkr 508	NPS-SWG1A	Remote operation and electrical trip protection to 13.8 KV supply bkrs to:
			• CNM-P1A(C)
			• FWS-P1A
			• Rx Recirc P1A CB5A
			• A Side Xfrms for:
			  • 4160V Circ Water and River M/U Swgs
			  • 480V LDC 1A, 1C, 1E, 1G, 1J, 1L, 1N, 1Q, 1S, 1U, 2A, 2C, 2E, 2G, (Cooling Towers) 3A, (Clarifier) 3C, (WTH) and MCC12A (River M/U)

		NPS-SWG1C via TRS1 if aligned. NPS-SWG1D via TRS1 if aligned.	Remote operation and electrical trip protection on NPS-ACB43. Remote operation and electrical trip protection on NPS-ACB44.
		NNS-SWG1A	Remote operation and electrical trip protection for 4160V supply Bkrs to: • CCS-P1A • CRD-P1A • HDL-P1A(C) • HVN-CHL1A • HVN-P1A • NNS-SWG1C • NNS-SWG4A • ENS-SWG1B

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)
BYS-PNL02A1 Continued	BYS-SWG01A Continued	NNS-SWG1C via TRS2 if aligned.	Remote operation and electrical trip protection to 4160V supply bkrs to: • CCS-P1C • HVN-CHL1C • HPCS 4160V E22-S004
		NJS-SWG 1A, 1C, 1E, 1G, 1S, 1U	Remote operation and electrical trip protection to 480V distribution bkrs on noted LDC.
		G36-PNLP002, RWCU F/D Panel	125 VDC control power to RWCU F/D Panel.
		EGS-PNL3A, Annunciator Power	125 VDC power to Div I DG local panel annunciators.
		EGF-P2A	Power to Div I DG Fuel Oil Booster Pump.
		BYS-SWG01A	DC control power to swgr load bkrs.
		IHS-SWG01D, Security Computer	DC control power to swgr load bkrs
BYS-PNL02A2	BYS-SWG01A Bkr 508	H13-P612, C Rx High Level Trip	Signal from C Narrow Range Transmitter, Rx High Water Level on Channel C.
		H13-P604, Inverter D17-K699A PRM	Power to A Offgas Post-Treat Rad Monitor with resultant INOP.
		H13-P855, 230 KV Generator Output Bkrs	Power to aux relay circuit for generator bkrs YWC-20635 and YWC-20640.
		H13-P612, Rx Recirc Bkrs 3A & 4A control power	Remote operation, electrical trip protection, and indication for Recirc P1A Bkrs 3A & 4A.

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)
BYS-PNL02A2 Continued	BYS-SWG01A Bkr 508 Continued	H13-P632, ARI Outboard Logic & Valve Power	ARI Outboard Scram capability with loss of power to ARI valves C11-SOVF162B, C11-SOVF162D, and C11-SOVF164A and Outbd Relay logic
		H13-P632, ARI Inboard Logic and valve power	ARI Inboard Scram capability with loss of power to ARI valves C11-SOVF162A, C11-SOVF162C, C11-SOVF160, and C11-SOVF164B and Inbd Relay logic.
BYS-PNL03A	BYS-SWG01A Bkr 507	NNS-SWG4A/4B	Remote operation and electrical trip protection for HVN-CHL2A, B, C, and NNS-SWG4A/B Tie.
		NNS-SWG5A	Remote operation and electrical trip protection for Rx Recirc P1A Bkr 2A.
		NJS-SWG 1J, 1L, 1N, 1Q	Remote operation and electrical trip protection to 480V Distribution bkrs on noted LDCs.
		B33-PNLP001A, LFMG A Relay Logic	Power to LFMG A 1RCSA16 Protective Relaying Circuit.
		EXS-PNL1, Main Gen. Exciter Cabinet	Power to Ckt EXSN10 for Alterrex Excitation System.
		FWL-P3A	Power to FWS-P1A Aux Oil Pump.
		CES-PNL1B & 1C, Generator Primary Trip	Power to Generator Primary Trip Relay Ckt. Loss of Elec. Fault Protection.
		CES-PNL1C, Sta. Service Sudden Press Trip	Power for Main and Norm. Sta. Serv Xfmr Sudden Pressure Trip Relay Ckt.
		CES-PNL1F & 1H Preferred Xfmrs E&C Primary Trip Protection	Power to E&C Preferred Xfmrs Primary Trip Protection

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)
BYS-PNL03A Continued	BYS-SWG01A Continued	2CES-PNL1F&1G Preferred Xfmrs F&D Primary Trip Protection	Power for F&D Pref Xfmrs Primary Trip Protection.
		CES-PNL1G & 1H, Preferred Xfmrs E&C Protection Ckt	Power to protection ckt. SPRA11 for E&C Preferred Xfmrs.
		CES-PNL1H, Bkr. 15	Power to Dual Channel Xfmr Trip, Ckt SPRN02 for RSS NO. 1 Tone System.
		CES-PNL1H, Bkr. 20	Power to Dual Channel Xfmr Trip, Ckt SPGN09 for unit generator Tone System.
BYS-SWG01B	BYS-CHGR1B Bkr 520 BYS-BAT01B1 Bkr 521 BYS-BAT01B2 Bkr 522	BYS-PNL02B1	See BYS-PNL02B1
		BYS-PNL02B2	See BYS-PNL02B2
		BYS-PNL03B	See BYS-PNL03B
		BYS-INV01B	DC Supply to inverter
		BYS-INV04	DC Supply to inverter
		RCIC Gland Seal Compressor common breaker with BYS-INV01B	Power to RCIC Gland Seal Compressor
		TML-ESOP	Turbine Emerg Seal Oil Pump

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)

BYS-PNL02B1	BYS-SWG01B Bkr 528	NPS-SWG1B	Remote operation and electrical trip protection to 13.8 KV supply bkrs to:
			• CNM-P1B
			• FWS-P1B(C)
			• Rx Recirc Pump P1B Bkr 5B
			• B Side Xfmrs for:
			  • 4160V Circ Water and River M/U Swg
			  • 480V LDCs 1B, 1D, 1F, 1H, 1K, 1M, 1P, 1R, 1T, 1V, 2B, 2D, 2F, 2H (Cooling Towers), 3B (Clarifier), 3D (WTH) and MCC12B (River M/U).

		NPS-SWG1C via TRS1 if aligned	Remote operation and electrical trip protection for NPS-ACB43
		NPS-SWG1D via TRS1 if aligned	Remote operation and electrical trip protection for NPS-ACB44
		NNS-SWG1B	Remote operation and electrical trip protection for 4160 VAC supply bkrs to: • CCS-P1B • C11-C001B • HDL-P1B(D) • HVN-CHL1B • HVN-P1B • NNS-SWG1C • NNS-SWG4B • ENS-SWG1A
		NNS-SWG1C via TRS2 if aligned.	See BYS-PNL02A1

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)
BYS-PNL02B1 Continued	BYS-SWG01B Bkr 528	NJS-SWG 1B, 1D, 1F, 1H, 1T, 1V	Remote operation and electrical trip protection to 480 VAC distribution bkrs on noted LDC.
		EGF-P2B	Power to Div II DG Fuel Oil Booster Pump.
		EGS-PNL3B Annunciator Power	Power to Div II DG local panel annunciators
		CES-PNL2A Gen Anti-Motoring Protection	Power for Main Generator Anti-Motoring Protection Ckt.
BYS-PNL02B2	BYS-SWG01B Bkr 528	BYS-SWG01B	DC control power to swg load bkrs
		H13-P613, B Rx High Level Trip	Signal from: • B FWS flow • B Narrow Range Lvl Xmtr Upset Range Lvl Xmtr, Rx High Water Level signal on Channel B.
		H13-P855, Turb. Gen. Condenser Neck Heater	Power to TMBN05 Runback ckt.
		H13-P613, Rx Recirc CB 3B & 4B bkr control	Remote operation, electrical trip protection, and indication for Recirc P1B Bkrs 3B and 4B.
		H13-P604, Inverter. D17-K699B PRM	Power to B Offgas Post-Treat Rad Monitor with resultant INOP.
		H13-P850, BOP Annunciator Electronics	BOP annunciators for the following panels: P870 - All P680 - 02, 03, 08, 09 P808 - All P863 - All P877 - All

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)
BYS-PNL02B2 Continued	BYS-SWG01B Bkr 528 continued	H13-P630, NSSS Annunciator Electronics	NSSS annunciators for the following panels: P845 - All P601 - 16, 17, 18, 19, 20, 21, 22 P680 - 01, 03, 04, 05, 06, 07
		H13-P846, 500 KV SWYD Supv. Cab.	Power to Fancy Point Supervisory Cabinet
BYS-PNL03B	BYS-SWG01B Bkr 527	NNS-SWG5B	Remote control and elect trip protection for Rx Recirc Pump B Bkr 2B.
		NJS-SWG 1K, 1M, 1P, 1R	Remote operation and electrical trip protection to 480V distribution bkrs on noted LDC.
		B33-PNLP001B, LFMG B relay logic	Power to LFMG B 1RCSB16, Protective Relaying Ckt.
		GMC-PNL101, H2-Stator Cooling	Test Mode Auto Start Of Stator Cooling P1A/P1B and Emergency Seal Oil Pump
		FWL-P3B	Power to FWS-P1B Aux Oil Pump.
		FWL-P3C	Power to FWS-P1C Aux Oil Pump.
		CES-PNLA, Generator B/U Trip Protection	B/U Protective Trip circuit for Main Generator.
		CES-PNL1D & 1E, Unit Trip Relays	Power to unit trip relay ckt. SPUN02
		CES-PNL1G & 1H, PFD XFMR B/U Protection	Power for Pfd Xfmrs E and C B/U Protective Trip Relay Ckt.
		CES-PNL1H	Power to dual channel xfmr trip Ckt SPRN03 for RSS No. 2 Tone System.

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)
BYS-PNL03B Continued	BYS-SWG01B Bkr 527	CES-RAK1	Power for the panel CES-RAK1
		2CES-PNL1E & 1G, Bkr 13	Power for SPRB06 Pfd Xfmrs F and D B/U Trip Protection Ckt.
		2CES-PNL1E & 1G, Bkr 14	Power for SPRB11 Pfd Xfmrs F and D Protection Ckt.
BYS-PNL04	BYS-CHGR04 or BYS-BAT04	NNS-SWG6A/B	Control power
		NJS-LDC4A/B	Control power
		SWC-PNL100 Local SWC Control Panel	Control and indication for the following: • SWC-P1A(B)(C), SVC WTR COOL PUMP • SWC-FN1A(B)(C)(D)(E) SVC WTR COOL TWR FAN • SWC Cooling Twr MOVs:
ENB-SWG01A	ENB-CHGR1A Bkr 560 or ENB-BAT01A Bkr 561	ENB-PNL02A	See ENB-PNL02A
		ENB-PNL03A	See ENB-PNL03A
		ENB-PNL04A	See ENB-PNL04A
		ENB-MCC1	See ENB-MCC1
		EGE-CAB01A	DC power to A DG Exciter Cabinet
		ENB-INV01A	DC supply to inverter
		ENB-INV01A1	DC Supply to inverter

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)
ENB-PNL02A	ENB-SWG01A Bkr 567	H13-P601 Meter Ckt	Position indication meters for: • E12-F073A • E12-F074A • E12-F003A • E12-F048A
		H13-P601 Valve Ckt	RCIC Supv Lights for Gov & Trip Throttle Valves. RCIC Steam Drain Trap AOV fail close.
		H13-P621 Relay Logic	125 VDC to RCIC Turbine Manual Trip. 125 VDC to Div I RCIC initiation, isolation and trip relay logic.
		H13-P691 Channel A B/U Scram Ckt.	B/U Scram valve C11-SOVF110A. EOC-RPT Trip Signals to Rx Recirc Bkr 3A & 3B.
		H13-P632 Power Supply E51-K603	RCIC Turbine Supervisory Lights Power to drain valves Remote Turbine Trip Electronic Governor Mechanism (EGM) control.
		H13-P851 CCP Aux. Control	CCP Div I Low Low Pressure, MOV Isolation. Loss Of Div I Manual Initiate capability.
		H13-P628 B21-1060	Div I 125 VDC for operation, permissives, interlocks and indication of ADS Valves.
		H13-P629 Relay Logic	RHR A Relay Logic RCIC Div I Isolation Signal to Turbine Trip Circuit. RHR A Pump suction trip signal from MOV position. Div I RPV LVL 2/LVL 8 Signals to RCIC Logic.

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)
ENB-PNL02A Continued	ENB-SWG01A Continued	H13-P629 Relay Logic and Power Supply E21A-PS1	LPCS Relay Logic. 24 VDC Power Supply to LPCS trip units. LPCS and RCIC alarm and annunciator E51-F045 position signal. RHR Pump A suction trip signal from MOV position. Refer to Attachment 3, Load List For Power Supply E21A-PS1 .
		H13-P623, Nuclear Steam Supply Shutoff (NSSSS)	Isolation of Div I NSSSS, RHR, RWCU, and MSL Drains. Initiation signal for BOP LOCA Isolation.
		H13-P851, SWP Aux Control	Manual Initiate function for SSW Div I Pump & MOV. Auto functions of pump and MOV on a Low Low SWP Pressure.
		H13-P851, DG Aux	Div I DG status light functions.
		H13-P851, Rx Plant Vent. Aux Ckt.	Auto function of HVR-AOV166, SWP-MOV502A and SWP-MOV503A on Low Containment to Annulus Differential pressure condition.
		H13-P951A, Digital Alarm Isolator Ckts	Trip signal to both CRD Pumps.
		H13-P851, Digital Alarm Isolator Ckts	Multiple annunciators, computer points & relays
		H13-P951, Digital Alarm Isolator Ckts	Alarms and computer points

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)
ENB-PNL03A	ENB-SWG01A Bkr 568	EGS-PNL2A, DG Relay Panel	125 VDC power to Div I DG B/U Fault Protection Ckt.
		EGE-CAB01A, Div I DG Excitation Cabinet	125 VDC Excitation Control Circuit for Div I DG
		C61-PNLP001, Remote Shutdown Panel	Alternate power supply that allows operation of RCIC, RHR Pump A, and SRVs from Remote S/D Panel in Emerg Mode.
		ENS-SWG2A, DG Neutral Bkr Switchgear	Remote operation and electrical trip protection for ENS-ACB11, STBY DG A NEUTRAL BKR
		EGS-PNL2A, Relay Pnl Differential Protection	Differential Protection Trip Circuit for Div I DG.
		EGS-PNL3A, DG Rear Air Start SOV	Rear start capability of Div I DG.
		EGS-PNL3A, DG Fwd Air Start and Stop SOV	Fwd start capability and stop capability of Div I DG.
		C61-PNLP001, Remote Shutdown RCIC Gland Seal Compressor.	DC control to RCIC Gland Seal Compressor.
		ENS-SWG3A	Remote operation and electrical trip protection to Rx Recirc Pump Bkr 3A.
		ENS-SWG3B	Remote operation and electrical trip protection to Rx Recirc Pump Bkr 3B.

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)
ENB-PNL04A	ENB-SWG01A Bkr 569	ENS-SWG1A	Remote operation and electrical trip protection to: • Div I DG Output Bkr • RHR Pump A • LPCS Pump • SWP-P2A 4160 VAC Supply Bkrs to: • EJS LDC Xfmrs 1A(2A) • Div I Stby Cooling Tower Xfmr 3A
		EJS-SWG1A	Remote operation and electrical trip protection to: • HVK-CHL1A(C) • HVC-ACU1A(2A) • BYS-CHGR1A • ENB-CHGR1A • Div I DG Exhaust Fan • SFC-P1A • HVF-FLT A heater • EHS-MCC8A • EHS-MCC14A
		EJS-SWG2A	Remote operation and electrical trip protection to: • Div I H2 Recombiner • GTS-FN1A • HVR-FN11A, ANNULUS MIXING FAN • HVR-UC1A, CNTMT UC • GTS-FLT1A Heater • HVR-UC11A • Polar Crane • NHS-MCC102A • EHS-MCC 2A, 2C, 2E, 2G, 2J, 2L, 15A

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)
ENB-PNL04A	ENB-SWG01A Bkr 569 Continued	ENB-SWG1A	Electrical trip protection to all load distribution breakers.
ENB-MCC1	ENB-SWG01A Bkr 565	E51-F010 E51-F013 E51-F019 E51-F022 E51-F031 E51-F045 E51-F059 E51-F068 E51-C002	DC power to electrically operate all RCIC DC MOVs and the . RCIC Turbine Trip and Throttle Valve
ENB- SWG01B	ENB-CHGR1B Bkr 580	ENB-PNL02B	See ENB-PNL02B
	ENB-BAT01B Bkr 581	ENB-PNL03B	See ENB-PNL03B
		EGE-CAB01B	DC power to B DG Exciter Cabinet.
		ENB-INV01B	DC supply to inverter
		ENB-INV01B1	DC supply to inverter
ENB-PNL02B	ENB-SWG01B Bkr 586	ENS-SWG1B	Remote operation and electrical trip protection to: • Div II DG Output Bkr. • RHR Pump B(C) • SWP-P2B(D) 4160V Supply Bkrs to: • EJS LDC Xfmrs 1B(2B) • Div II Stby Cooling Tower Xfmr 3B

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)
ENB-PNL02B Continued	ENB-SWG01B Continued	EJS-SWG1B	Remote operation and electrical trip protection to: • HVK-CHL1B(D) • HVC-ACU1B(2B) • BYS-CHGR1B • ENB-CHGR1B • Div II DG Exhaust Fan • SFC-P1B • HVF-FLT B Heater • EHS-MCC8B • EHS-MCC14B • NHS-MCC101
		EJS-SWG2B	Remote operation and electrical trip protection to: • Div II H2 Recombiner • GTS FN1B • HVR-FN11B, ANNULUS MIXING FAN • HVR-UC1B(1C), CNTMNT UCs • GTS-FLT B Heater • HVR-UC11B • EHS-MCC 2B, 2D, 2F, 2H, 2K, 15B • NHS-MCC102B • IHS-CHGR1D
		H13-P601 meter ckt.	Position indication meter for: E12-F003B E12-F048B E12-F073B E12-F074B
		H13-P601 valve control	RCIC Steam Drain Trap AOVs fail close and lose indication.

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)
ENB-PNL02B Continued	ENB-SWG01B Continued	H13-P852 CCP Aux Control	CCP Div II Low-Low Pressure isolation Div II Manual Initiate capability.
		H13-P692 Channel B B/U Scram Ckt.	Ability to energize B/U Scram C11-SOVF110B. EOC-RPT trip signals to Rx Recirc Bkr 4A & 4B.
		H13-P852 Rx Plant Vent. Aux. Ckt.	Low Containment to Annulus Differential Pressure auto function for the following valves: • HVR-AOV128 • HVN-MOV102 • SWP-MOV502B • SWP-MOV503B • HVN-MOV129 • HVN-MOV130
		H13-P618, Control Panel RHR	RHR B relay logic. RCIC Div II Isolation Signal to Turbine Trip Circuit. RHR Pump B trip signal from MOV position.
		H13-P618, Relay Logic	125 VDC to Div II RCIC Initiation, Isolation and Trip relay logic.
		H13-P631, B21-1060	Div II SOV 125 VDC for operation, permissive, interlocks and indication for ADS valves.
		H13-P852, SSW Aux Control	Manual Initiate function for Div II SSW Pumps & MOVs. Auto functions of pumps & MOV on Low Low SWP Pressure.
		H13-P952A, Digital Alarm Isolator Ckt.	Trip signal to both CRD Pumps.
		H13-P852 DG Aux.	Div II DG Status Light functions
		H13-P852 digital computer isolator ckts.	Annunciators, Computer Points and Relays.

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)
ENB-PNL02B Continued	ENB-SWG01B Continued	H13-P622 NSSSS	Isolation of Div II NSSSS, RHR, RWCU, and MSL Drains Initiation signal for BOP LOCA Isolation.
		H13-P618 AT7 output	E51-F045 Position signal to Steam Drain Trap AOVs. Trip signal to RHR Pump B from suction MOV Interlock.
		ENB-SWG01B	125 VDC to distribution bkrs.
		Power Supply E12A-PS1	Refer to Attachment 2, Load List For Power Supply E12A-PS1
ENB-PNL03B	ENB-SWG01B Bkr 587	EGS-PNL2B, Relay Pnl.	125 VDC power to Div II DG B/U Fault Protection Generator Circuit
		EGE-CAB01B Div II DG Excitation Cabinet	125 VDC Excitation control circuit for Div II DG.
		RSS-PNL102 Remote S/D Panel	Control power and indication for B21-RVF051C, B21-RVF051D, and B21-RVF051G in Emergency Mode.
		ENS-SWG2B DG Neutral Swg	Remote control and elect trip protection for ENS-ACB31, STBY DG B NEUTRAL BKR.
		EGS-PNL2B Relay Pnl. Differential Protection	Differential Protection Trip Circuit for Div II DG.
		EGS-PNL3B DG Rear Air Start SOV	Rear Start capability of Div II DG.
		EGS-PNL3B DG Fwd Air Start & Stop SOV	Fwd Start capability and Stop capability of Div II DG.
		ENS-SWG4A	Remote operation and electrical trip protection to Rx Recirc Pump BKR 4A.
		ENS-SWG4B	Remote operation and electrical trip protection to RX Recirc Pump BKR 4B.

SYSTEM DEVICE TABLES

BUS	POWER FROM	PROVIDES POWER TO	EFFECTS OF POWER LOSS (LOSS OF)
IHS-SWG01D	IHS-CHGR1D Bkr 540	IHS-INV01, Security Computer UPS	Loss of DC power to Inverter
	IHS-BAT01D Bkr 541	BYS-INV03, Backup Swing Inverter	Loss of DC power to Inverter
E22-S001PNL	E22-CHGR Bkr 620	E22-S004 Swgr Bkr Control	Remote operation and electrical trip protection to E22-S004
	E22-BATT Bkr 621	4160V Metal Clad Bkr Control Relaying	Loss of DC control power for Swgr Relay circuits
		Div III DG Fuel Prime & Lube Oil Pumps	Loss of power to both pumps.
		Div III DG Turbo Oil Pump	Loss of power to pump.
		Div III DG Field Flash	Loss of power to Field Flash circuit
		Div III DG Control Cab	Loss of Div III DG Engine control power.
		Div III DG Generator Control Cab	Loss of Div III DG Generator control power.
		H13-P625	Loss of power to Computer Input Cab.
E22-S001PNL	E22-CHGR	H13-P808	Loss of power to Div III circuits.
	E22-BATT	H13-P601 HPCS control	Loss of power to P601 circuits.
		power Supply E22A-PS1	Refer to Attachment 4, Load List For Power Supply E22A-PS1.

For
SRO

Question 6

REACTOR COOLDOWN DATA

START TIME PLUS		ACTUAL TIME	RPV PRESSURE	RPV TEMPERATURE FROM STEAM TABLES	RPV TEMPERATURE FROM PYROMETER (RPV COOLANT LESS THAN 212°F)
HRS	MIN				
0	15				
	30				
	45				
	60				
1	15				
	30				
	45				
	60				
2	15				
	30				
	45				
	60				
3	15				
	30				
	45				
	60				
4	15				
	30				
	45				
	60				
5	15				
	30				
	45				
	60				

REACTOR COOLDOWN DATA

START TIME PLUS		ACTUAL TIME	RPV PRESSURE	RPV TEMPERATURE FROM STEAM TABLES	RPV TEMPERATURE FROM PYROMETER (RPV COOLANT LESS THAN 212°F)
HRS	MIN				
6	15				
	30				
	45				
	60				
7	15				
	30				
	45				
	60				
8	15				
	30				
	45				
	60				
9	15				
	30				
	45				
	60				
10	15				
	30				
	45				
	60				
11	15				
	30				
	45				
	60				

REACTOR COOLDOWN DATA

START TIME PLUS		ACTUAL TIME	RPV PRESSURE	RPV TEMPERATURE FROM STEAM TABLES	RPV TEMPERATURE FROM PYROMETER (RPV COOLANT LESS THAN 212°F)
HRS	MIN				
12	15				
	30				
	45				
	60				
13	15				
	30				
	45				
	60				
14	15				
	30				
	45				
	60				
15	15				
	30				
	45				
	60				
16	15				
	30				
	45				
	60				
17	15				
	30				
	45				
	60				

REACTOR COOLDOWN DATA

START TIME PLUS		ACTUAL TIME	RPV PRESSURE	RPV TEMPERATURE FROM STEAM TABLES	RPV TEMPERATURE FROM PYROMETER (RPV COOLANT LESS THAN 212°F)
HRS	MIN				
18	15				
	30				
	45				
	60				
19	15				
	30				
	45				
	60				
20	15				
	30				
	45				
	60				
21	15				
	30				
	45				
	60				
22	15				
	30				
	45				
	60				
23	15				
	30				
	45				
	60				

REACTOR COOLDOWN DATA

STEAM TABLE	
RPV Pressure (psig)	Sat. Steam Temperature (°F)
1100	557
1050	552
1000	546
950	540
900	533
850	527
800	520
750	513
700	505
650	497
600	489
550	479
500	470
450	459
400	448
350	435
300	421
250	406
200	388
150	366
100	338
50	298

REACTOR COOLDOWN DATA

Remarks: _____

_____

_____

_____

_____

Performed By: _____ _____ _____ _____/_____
Signature KCN Initials Date/Time

_____ _____ _____ _____/_____
Signature KCN Initials Date/Time

_____ _____ _____ _____/_____
Signature KCN Initials Date/Time

Reviewed By: _____ _____ _____
OSM/CRS KCN Date/Time

For
SRO

Question 7

*G12.1.7

ENTERGY

RIVER BEND STATION
STATION OPERATING MANUAL
*ABNORMAL OPERATING PROCEDURE

*LOSS OF REACTOR PLANT COMPONENT COOLING WATER

PROCEDURE NUMBER:	***AOP-0011**
REVISION NUMBER:	***13**
Effective Date:	* OCT 0 4 2001

NOTE : SIGNATURES ARE ON FILE.

*INDEXING INFORMATION

CONTINUOUS USE

TABLE OF CHANGES

LETTER DESIGNATION TRACKING NUMBER	DETAILED DESCRIPTION OF CHANGES

TABLE OF CONTENTS

1 PURPOSE/DISCUSSION

1.1 The purpose of this procedure is to provide the operator with the instructions necessary to mitigate a loss of Reactor Plant Component Cooling Water.

1.2 Failure of CCP interrupts cooling water supply to the following components:

- Reactor Recirc Pump Seal, Bearing, and Motor Winding Coolers.
- RWCU Pump Seal, Pedestal, and Bearing Coolers.
- Fuel Pool Cooling Heat Exchangers.
- RHR Pump A and B Seal Coolers.
- RWCU Non-regenerative Heat Exchangers.
- Reactor Plant Sample Panel Coolers.
- Drywell Equipment Drain Heat Exchanger.
- CRD Pump Lube Oil Coolers.

2 SYMPTOMS

2.1 CCP Pump trip

2.2 Lowering CCP System pressure

2.3 Lowering CCP Surge Tank level

2.4 RWCU isolation

2.5 Raising Reactor Recirc Pump Temperatures

3 AUTOMATIC ACTIONS

3.1 Standby CCP Pump starts on low pressure or trip of a running pump.

3.2 G33-F004, RWCU PUMPS OUTBD SUCTION VALVE isolates on RWCU Demin Inlet high temperature.

3.3 The following actions occur on CCP extreme low pressure of 56 psig:

- CCP-MOV16A, RPCCW LOOP A SUPPLY closes.
- CCP-MOV335, LOOP A UP STREAM RETURN closes.
- CCP-MOV130, LOOP A DN STREAM RETURN closes.
- CCP-MOV16B, RPCCW LOOP B SUPPLY closes.
- CCP-MOV336, LOOP B UP STREAM RETURN closes.
- CCP-MOV129, LOOP B DN STREAM RETURN closes.
- CCP-MOV169, CRD PUMP CLG UP STREAM closes.
- CCP-MOV163, CRD PUMP CLG DN STREAM closes.
- C11-C001A (B), CRD PUMP A (B) trips.
- SWP-P2A (B) (D), STBY SVCE WTR PUMPs start.
- SWP-MOV40A (B) (D), STBY PUMP 2A (2B) (2D) DISCH opens.
- SWP-MOV57A (B), NORM SVCE WTR SUPPLY closes.
- SWP-MOV96A (B), NORM SVCE WTR RETURN closes.
- SWP-MOV55A (B), STBY CLG TOWER 1 INLET opens.
- SWP-MOV501A(B), RPCCW HX A(B) SUPPLY closes.
- SWP-MOV511A(B), RPCCW HX A(B) RETURN closes.
- SWP-FR60A (B), STBY SVCE WTR SUPPLY & RETURN FLOW RECORDERS start.

- SWP-PR50A (B), STBY CLG TOWER LVL & PUMP DISCH PRESS RECORDERS start.

4 IMMEDIATE OPERATOR ACTIONS

4.1 IF a total loss of CCP occurs, THEN perform the following:

4.1.1. Manually scram the Reactor.

4.1.2. Trip and isolate both Recirc Pumps.

NOTE

Steps in the following section may be performed concurrently as appropriate.

5 SUBSEQUENT OPERATOR ACTIONS

5.1 Perform the following:

- IF the Reactor Recirc Pumps are tripped and seal purge flow is lost, THEN close the Recirc Pump Seal Staging Line Shutoff Valves as follows:

  PLACE the control switch for B33-FVF075A SEAL STAGING LINE SHUTOFF VALVE to AUTO.

  PLACE the control switch for B33-FVF075B SEAL STAGING LINE SHUTOFF VALVE to AUTO.

- IF the following conditions exist, THEN place the Mode Switch in SHUTDOWN:

  Reactor Steam Dome pressure less than 600 psig

  AND

  No CRD Pump is running

  AND

  CRD Accumulator associated with a withdrawn control rod is inoperable.

- IF the following conditions exist, THEN place the Mode Switch in SHUTDOWN:

  Reactor Steam Dome pressure greater than or equal to 600 psig

  AND

  CRD Charging Water Header pressure less than 1540 psig

  AND

  More than one CRD Accumulator is inoperable

  AND

  CRD Charging Water Header pressure can not be restored and maintained within 20 minutes

- At H13-P870, monitor the following:

  CCP-PI127, RPCCW HDR PRESSURE

  CCP-H/A128, RX PLT CMPNT CLG WTR SUPPLY HEADER TEMP

  CCP-LI120, RPCCW SURGE TK LEVEL

- IF RPCCW Surge Tank level is lowering, THEN verify MWS-AOV134, RPCCW SURGE TANK MAKE-UP is open.

- IF a leak is suspected, THEN walkdown the system to locate and isolate the leak.

NOTE

Steps 5.2 and 5.3 may be performed at the discretion of the OSS/CRS.

5.2 Align SSW to the CRD Pump Bearing Cooler as follows:

5.2.1. Open SWP-MOV510B, RPCCW LOOP B SUPPLY.

5.2.2. Open SWP-MOV504B, RPCCW LOOP B RETURN.

5.2.3. Place RPCCW DIV I TEST Switch in TEST.

5.2.4. Place RPCCW DIV 2 TEST Switch in TEST.

5.2.5. Open CCP-MOV169, CRD PUMP CLG UP STREAM.

5.2.6. Open CCP-MOV163, CRD PUMP CLG DN STREAM.

5.2.7. Start the CRD System per SOP-0002, Control Rod Drive Hydraulic.

5.3 Cross-tie SSW to the in-service Fuel Pool Cooling Heat Exchanger as follows:

5.3.1. Open SWP-MOV510A(B), RPCCW LOOP A(B) SUPPLY.

5.3.2. Open SWP-MOV504A(B), RPCCW LOOP A(B) RETURN.

CAUTION

Failure to gradually restore cooling to Recirc Pump Seals can result in thermal shock and subsequent seal failure. Do not rapidly restore cooling to Recirc Pump Seals.

5.4 Determine the cause and restore CCP per SOP-0016, Reactor Plant Component Cooling Water System and SOP-0003, Reactor Recirculation.

6 REFERENCES

6.1 Technical Specifications 3.1.5

6.2 ESK-6CCP01

6.3 ESK-6CCP02

6.4 ESK-11CCP01

6.5 ESK-11CCP02

6.6 USAR Section 9.2.2

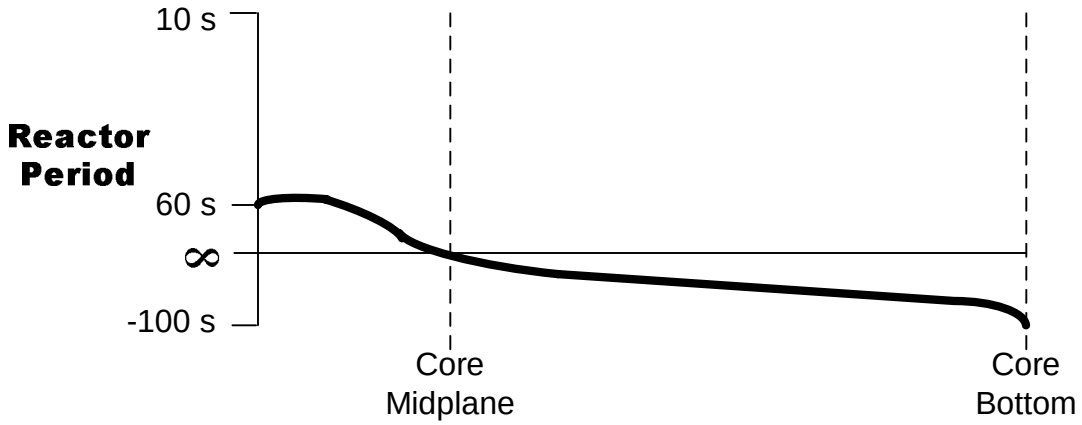
6.7 SDC-115, Reactor Plant Component Cooling Water System Design Criteria

For
SRO

Question 36

DRAWING FOR QUESTION 36

A



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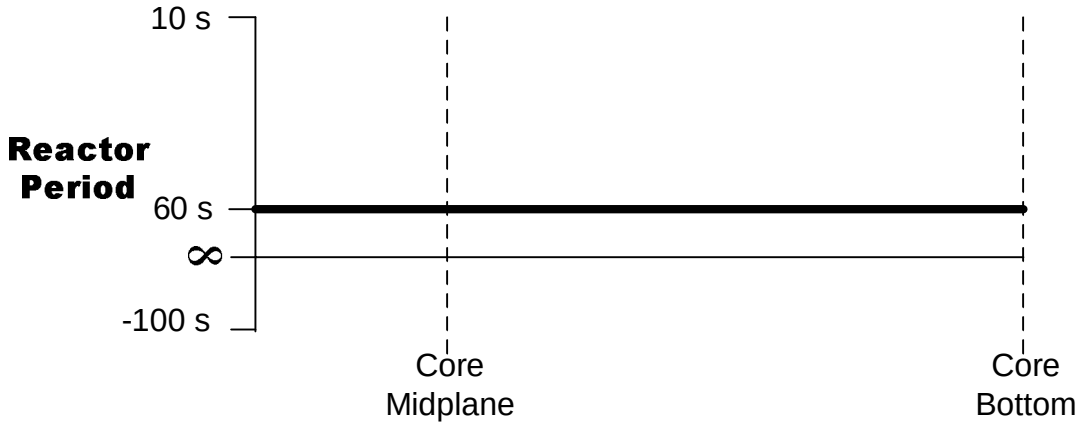

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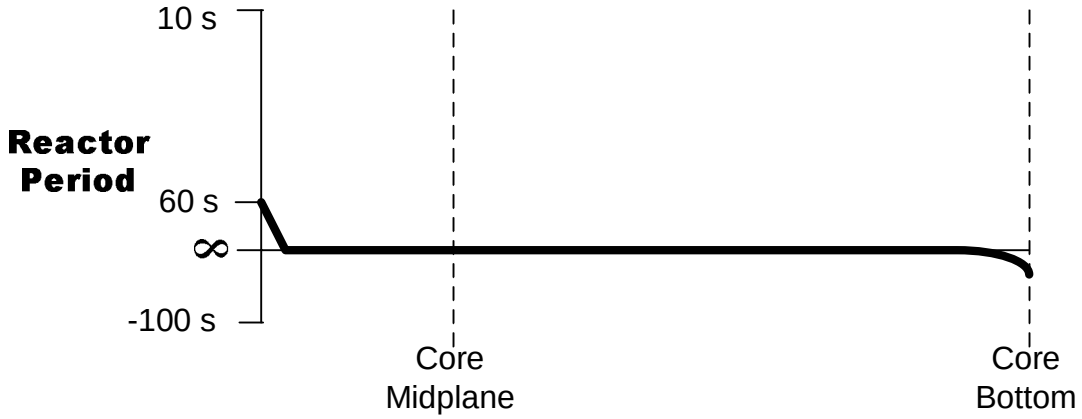

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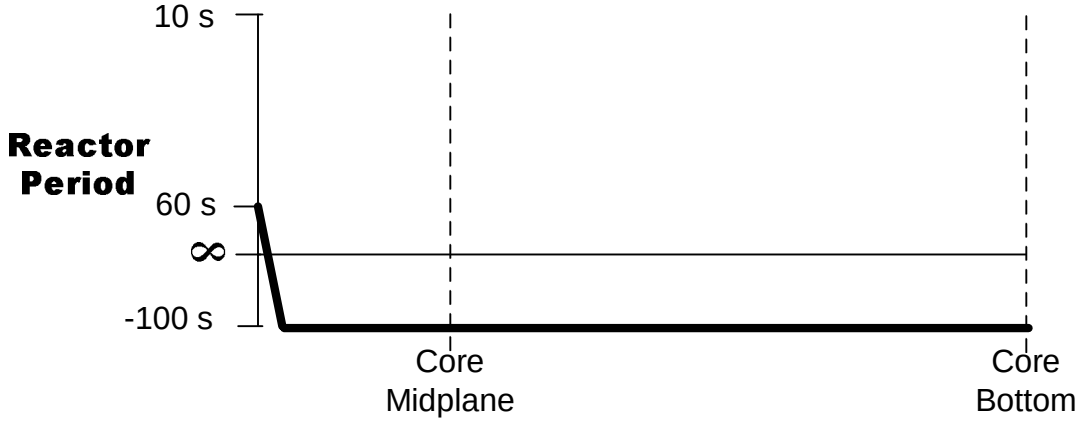


For
SRO

Question 75

ALARM NO. 2158	**RECIRC LOOP A LOW ΔT**	H13-P680/04A/A05

INITIATING DEVICES

1. K702A Relay

SETPOINTS

1. Less than 8.6°F difference between Reactor Steam Dome temperature and Recirc Pump A suction temperature.

AUTOMATIC ACTIONS

1. IF Recirc Pump "B" AND Recirc Pump "A" are ≥95% speed, THEN Recirc Pump "A" trips to OFF after a 15 minute time delay.
2. IF Recirc Pump "B" is <95% speed AND Recirc Pump "A" is ≥95% speed, THEN Recirc Pump "A" downshifts to 25% speed (Slow Speed) after a 15 minute time delay.

OPERATOR ACTIONS

1. Verify Automatic Actions.
2. Perform the following:
   - Monitor Recirc Pump vibration levels.
   - IF Recirc Pump vibration levels are excessive, THEN downshift the Recirc Pump to 25% speed AND Go To AOP-0024, Thermal Hydraulic Stability Controls.

NOTE

Video Service Screen 46 can be used to validate the low ΔT condition.

   - Validate the low ΔT condition.
3. IF the Recirc Pump trips, THEN Refer To GOP-0004, Single Loop Operation.
4. IF Recirc Pump downshifts to 25% speed, THEN Go To AOP-0024, Thermal Hydraulic Stability Controls.
5. IF the low ΔT condition is not valid, THEN place key operated switch B33-S125A, STEAM DOME/PUMP SUCTION ΔT INTERLOCK BYPASS, in BYPASS.

LONG TERM ACTIONS

1. IF B33-S125A was placed in BYPASS, THEN continuously monitor the following which may indicate possible Jet Pump or Recirc Pump cavitation:
   a. Power to Flow Map,
   b. Recirc Pump vibration, and
   c. Jet Pump Performance.
2. IF the low ΔT condition is valid, THEN initiate a Condition Report to track the cumulative time for pump cavitation (maximum = 3 hours).

	RECIRC LOOP A LOW ΔT	
ALARM NO. 2158		H13-P680/04A/A05

POSSIBLE CAUSES

1. Reactor pressure decrease.
2. Instrument malfunction (steam dome pressure temperature conversion, recirc pump suction temperature).

REFERENCES

1. GE-NE-B3300280-01 (CR95-1216)
2. MR 96-0004

For
SRO

Question 78

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.1 ECCS - Operating

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

APPLICABILITY: MODE 1,
MODES 2 and 3, except ADS valves are not required to be OPERABLE with reactor steam dome pressure $\leq$ 100 psig.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One low pressure ECCS injection/spray subsystem inoperable.	A.1 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	7 days
B. High Pressure Core Spray (HPCS) System inoperable.	B.1 Verify by administrative means RCIC System is OPERABLE when RCIC is required to be OPERABLE. AND B.2 Restore HPCS System to OPERABLE status.	1 hour 14 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Two ECCS injection subsystems inoperable. OR One ECCS injection and one ECCS spray subsystem inoperable.	C.1 Restore one ECCS injection/spray subsystem to OPERABLE status.	72 hours
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	12 hours 36 hours
E. One ADS valve inoperable.	E.1 Restore ADS valve to OPERABLE status.	14 days
F. One ADS valve inoperable. AND One low pressure ECCS injection/spray subsystem inoperable.	F.1 Restore ADS valve to OPERABLE status. OR F.2 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	72 hours 72 hours
G. Two or more ADS valves inoperable. OR	G.1 Be in MODE 3. AND	12 hours

(continued)

ACTIONS

CONDTION	REQUIRED ACTION	COMPLETION TIME
G. (continued) Required Action and associated Completion Time of Condition E or F not met.	G.2 Reduce reactor steam dome pressure to ≤ 100 psig.	36 hours
H. HPCS and Low Pressure Core Spray (LPCS) Systems inoperable. <u>OR</u> Three or more ECCS injection/spray subsystems inoperable. <u>OR</u> HPCS System and one or more ADS valves inoperable. <u>OR</u> Two or more ECCS injection/spray subsystems and one or more ADS valves inoperable.	H.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify, for each ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	31 days
SR 3.5.1.2	----------NOTE---------- Low pressure coolant injection (LPCI) subsystems may be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the residual heat removal cut in permissive pressure in MODE 3, if capable of being manually realigned and not otherwise inoperable. ----------	
	Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.5.1.3	Verify ADS accumulator supply pressure is ≥ 131 psig.	31 days
SR 3.5.1.4	Verify each ECCS pump develops the specified flow rate with the specified pump differential pressure. SYSTEM / FLOW RATE / PUMP DIFFERENTIAL PRESSURE LPCS: ≥ 5010 gpm: ≥ 282 psid LPCI: ≥ 5050 gpm: ≥ 102 psid HPCS: ≥ 5010 gpm: ≥ 415 psid	In accordance with the Inservice Testing Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.5	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	18 months
SR 3.5.1.6	----------NOTE---------- Valve actuation may be excluded. ---------- Verify the ADS actuates on an actual or simulated automatic initiation signal.	18 months
SR 3.5.1.7	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify each ADS valve relief mode actuator strokes when manually actuated.	In accordance with the Inservice Testing Program on a STAGGERED TEST BASIS for each valve solenoid
SR 3.5.1.8	----------NOTE---------- ECCS actuation instrumentation is excluded. ---------- Verify the ECCS RESPONSE TIME for each ECCS injection/spray subsystem is within limits.	18 months

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.3 RCIC System

LCO 3.5.3 The RCIC System shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3 with reactor steam dome pressure > 150 psig.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. RCIC System inoperable.	A.1	Verify by administrative means High Pressure Core Spray System is OPERABLE.	1 hour
	AND		
	A.2	Restore RCIC System to OPERABLE status.	14 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	12 hours
	AND		
	B.2	Reduce reactor steam dome pressure to $\leq$ 150 psig.	36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.5.3.1	Verify the RCIC System piping is filled with water from the pump discharge valve to the injection valve.	31 days
SR 3.5.3.2	Verify each RCIC System manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.5.3.3	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify, with RCIC steam supply pressure $\leq$ 1075 psig and $\geq$ 920 psig, the RCIC pump can develop a flow rate $\geq$ 600 gpm against a system head corresponding to reactor pressure.	92 days
SR 3.5.3.4	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify, with RCIC steam supply pressure $\leq$ 165 psig and $\geq$ 150 psig, the RCIC pump can develop a flow rate $\geq$ 600 gpm against a system head corresponding to reactor pressure.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.3.5	----------NOTE---------- Vessel injection may be excluded. ---------- Verify the RCIC System actuates on an actual or simulated automatic initiation signal.	18 months

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources–Operating

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

a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electric Power Distribution System; and

b. Three diesel generators (DGs).

APPLICABILITY: MODES 1, 2, and 3.

----------NOTE----------
Division III AC electrical power sources are not required to be OPERABLE when High Pressure Core Spray System and Standby Service Water System pump 2C are inoperable.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	A.1 Perform SR 3.8.1.1 for OPERABLE required offsite circuit. AND	1 hour AND Once per 8 hours thereafter (continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2 Restore required offsite circuit to OPERABLE status.	72 hours AND 24 hours from discovery of two divisions with no offsite power AND 17 days from discovery of failure to meet LCO
B. One required DG inoperable.	B.1 Perform SR 3.8.1.1 for OPERABLE required offsite circuit(s).	1 hour AND Once per 8 hours thereafter
	AND	
	B.2 Declare required feature(s), supported by the inoperable DG, inoperable when the redundant required feature(s) are inoperable.	4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)
	AND	

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.3.1 Determine OPERABLE DG(s) are not inoperable due to common cause failure. OR B.3.2 Perform SR 3.8.1.2 for OPERABLE DG(s). AND B.4 Restore required DG to OPERABLE status.	24 hours 24 hours 72 hours from discovery of an inoperable Division III DG AND 14 days AND 17 days from discovery of failure to meet LCO
C. Two required offsite circuits inoperable.	C.1 Declare required feature(s) inoperable when the redundant required feature(s) are inoperable. AND C.2 Restore one required offsite circuit to OPERABLE status.	12 hours from discovery of Condition C concurrent with inoperability of redundant required feature(s) 24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. One required offsite circuit inoperable. AND One required DG inoperable.	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems–Operating," when any division is de-energized as a result of Condition D. ----------		
	D.1	Restore required offsite circuit to OPERABLE status.	12 hours
	OR		
	D.2	Restore required DG to OPERABLE status.	12 hours
E. Two required DGs inoperable.	E.1	Restore one required DG to OPERABLE status.	2 hours OR 24 hours if Division III DG is inoperable
F. Required Action and Associated Completion Time of Condition A, B, C, D, or E not met.	F.1	Be in MODE 3.	12 hours
	AND		
	F.2	Be in MODE 4.	36 hours
G. Three or more required AC sources inoperable.	G.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each required offsite circuit.	7 days
SR 3.8.1.2	----------NOTES---------- 1. Performance of SR 3.8.1.7 satisfies this SR. 2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 3. A modified DG start involving gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met. ---------- Verify each DG starts from standby conditions and achieves: a. For DG 1A and DG 1B, steady state voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz. b. For DG 1C: 1. Maximum of 5400 V, and 66.75 Hz, and 2. Steady state voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.3	----------NOTES---------- 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by, and immediately follow, without shutdown, a successful performance of SR 3.8.1.2 or SR 3.8.1.7 ---------- Verify each DG operates for ≥ 60 minutes at a load ≥ 3000 kW and ≤ 3100 kW for DG 1A and DG 1B, and ≥ 2500 kW and ≤ 2600 kW for DG 1C.	31 days
SR 3.8.1.4	Verify each day tank contains ≥ 316.3 gal of fuel oil.	31 days
SR 3.8.1.5	Check for and remove accumulated water from each day tank.	31 days
SR 3.8.1.6	Verify the fuel oil transfer system operates to automatically transfer fuel oil from the storage tank to the day tank.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.7	----------NOTE---------- All DG starts may be preceded by an engine prelube period. ---------- Verify each DG starts from standby conditions and achieves: a. For DG 1A and DG 1B, steady state voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz, in ≤ 10 seconds. b. For DG 1C: 1. Maximum of 5400 V, and 66.75 Hz, and 2. Steady state voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz, in ≤ 13 seconds.	184 days
SR 3.8.1.8	----------NOTE---------- This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify manual transfer of unit power supply from the normal offsite circuit to required alternate offsite circuit.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	----------NOTE---------- 1. Credit may be taken for unplanned events that satisfy this SR. 2. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9 ---------- Verify each DG rejects a load greater than or equal to its associated single largest post accident load and following load rejection, the engine speed is maintained less than nominal plus 75% of the difference between nominal speed and the overspeed trip setpoint or 15% above nominal, whichever is lower.	18 months
SR 3.8.1.10	----------NOTE---------- Credit may be taken for unplanned events that satisfy this SR. ---------- Verify each DG operating at a power factor ≤ 0.9 does not trip and voltage is maintained ≤ 4784 V for DG 1A and DG 1B and ≤ 5400 V for DG 1C during and following a load rejection of a load ≥ 3030 kW and ≤ 3130 kW for DGs 1A and 1B and ≥ 2500 kW and ≤ 2600 kW for DG 1C.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.11	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses; b. Load shedding from emergency buses for Divisions I and II; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C, 2. energizes auto-connected shutdown loads, 3. maintains steady state voltage ≥ 3740 V and ≤ 4580 V, 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.12	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1 or 2. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify on an actual or simulated Emergency Core Cooling System (ECCS) initiation signal each DG auto-starts from standby condition and: a. For DG 1C during the auto-start maintains voltage ≤ 5400 V and frequency ≤ 66.75 Hz; b. In ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C after auto-start and during tests, achieves voltage ≥ 3740 V and ≤ 4580 V; c. In ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C after auto-start and during tests, achieves frequency ≥ 58.8 Hz and ≤ 61.2 Hz; and d. Operates for ≥ 5 minutes.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.13	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify each DG's automatic trips are bypassed on an actual or simulated ECCS initiation signal except: a. Engine overspeed; and b. Generator differential current.	18 months
SR 3.8.1.14	----------NOTES---------- 1. Momentary transients outside the load and power factor ranges do not invalidate this test. 2. Credit may be taken for unplanned events that satisfy this SR. ---------- Verify each DG operating at a power factor $\leq$ 0.9, operates for $\geq$ 24 hours: a. For DG 1A and DG 1B loaded $\geq$ 3030 kW and $\leq$ 3130 kW; and b. For DG 1C: 1. For $\geq$ 2 hours loaded $\geq$ 2750 kW and $\leq$ 2850 kW, and 2. For the remaining hours of the test loaded $\geq$ 2500 kW and $\leq$ 2600 kW.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.15	----------NOTES---------- 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 1 hour loaded ≥ 3000 kW and ≤ 3100 kW for DG 1A and DG 1B, and ≥ 2500 kW and ≤ 2600 for DG 1C, or operating temperatures have stabilized, which ever is longer. Momentary transients outside of the load range do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period. --- Verify each DG starts and achieves, in ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C, voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	18 months
SR 3.8.1.16	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. --- Verify each DG: a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power; b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.17	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. ----------	
	Verify, with a DG operating in test mode and connected to its bus, an actual or simulated ECCS initiation signal overrides the test mode by: a. Returning DG to ready-to-load operation; and b. Automatically energizing the emergency loads from offsite power.	18 months
SR 3.8.1.18	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. ----------	
	Verify sequence time is within ± 10% of design for each load sequencer timer.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.19	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses for Divisions I and II; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C, 2. energizes auto-connected emergency loads, 3. achieves steady state voltage ≥ 3740 V and ≤ 4580 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.20	----------NOTE---------- All DG starts may be preceded by an engine prelube period. ----------	
	Verify, when started simultaneously from standby condition, each DG achieves, in ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C, voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	10 years

For
SRO

Question 81

3.2 POWER DISTRIBUTION LIMITS

3.2.2 MINIMUM CRITICAL POWER RATIO (MCPR)

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

APPLICABILITY: THERMAL POWER ≥ 23.8% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Any MCPR not within limits.	A.1 Restore MCPR(s) to within limits.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to < 23.8% RTP.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify all MCPRs are greater than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ 23.8% RTP AND 24 hours thereafter

FIGURE 10. OPERATING LIMIT MCPR ($MCPR_F$) VERSUS CORE FLOW FOR NON-KAN ATRIUM-10 FOR RECIRCULATION SYSTEM IN LOOP AUTO CONTROL, ALL EXPOSURES

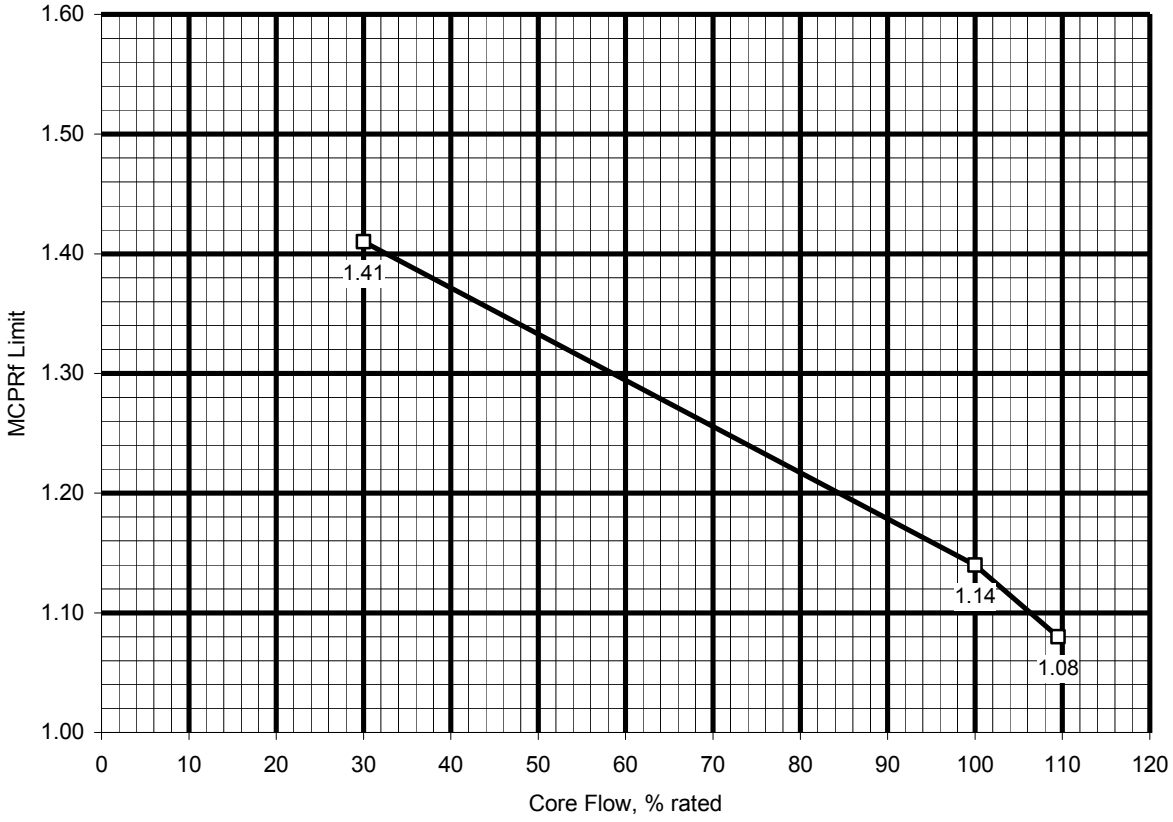
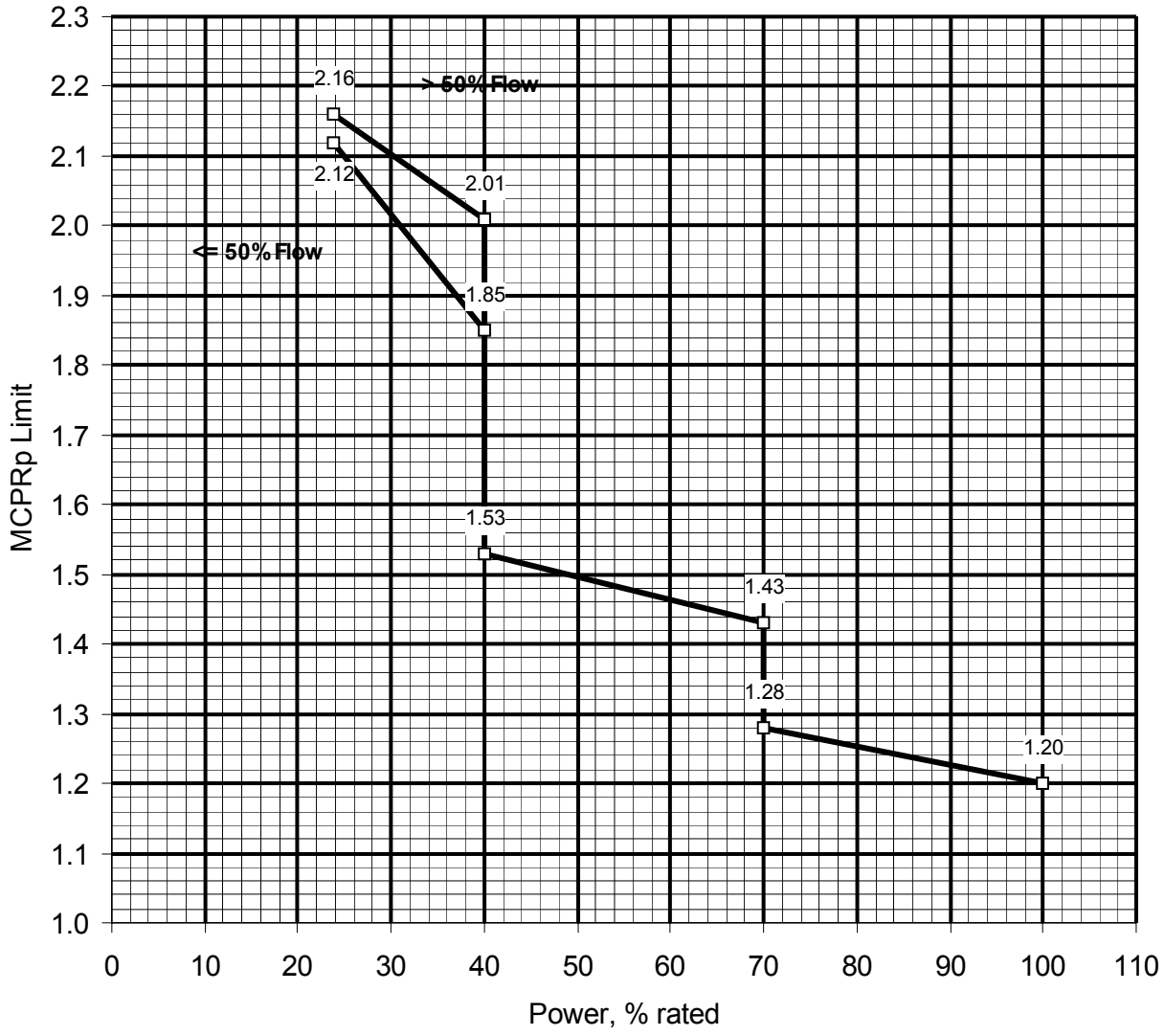


FIGURE 15. OPERATING LIMIT MCPR ($MCPR_P$) VERSUS CORE POWER FOR NON-KAN ATRIUM-10, EXPOSURE RANGE BOC TO BOC + 5200 MWD/MTU



For
SRO

Question 83

FIGURE 3

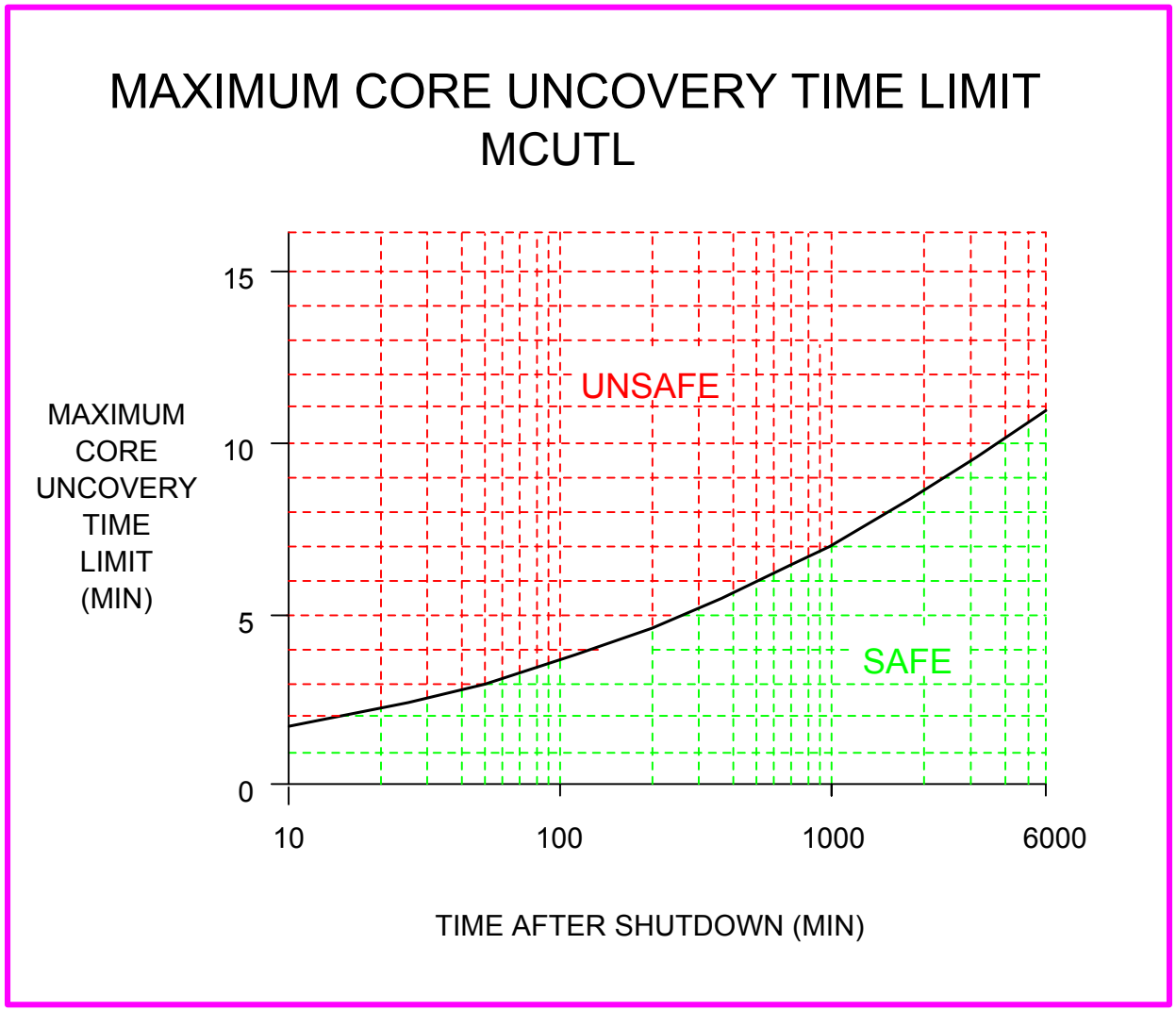

MAXIMUM CORE UNCOVERY TIME LIMIT
MCUTL
MAXIMUM CORE UNCOVERY TIME LIMIT (MIN)
15
10
5
0
UNSAFE
SAFE
10
100
1000
6000
TIME AFTER SHUTDOWN (MIN)

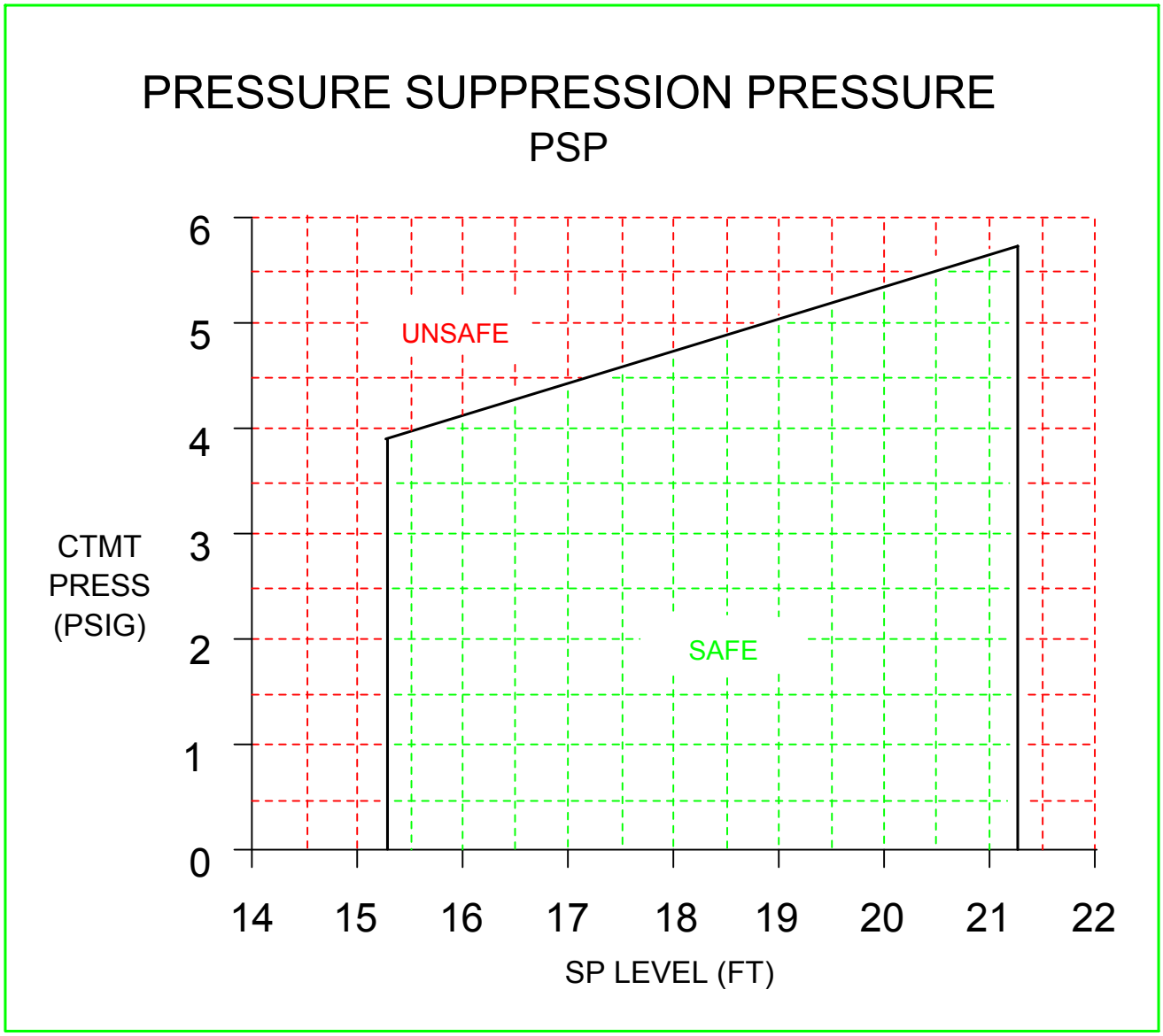
TABLE 1

MINIMUM CORE FLOODING INTERVAL - MCFI	
NUMBER OF OPEN SRVS	TIME RPV PRESSURE HAS REMAINED ABOVE 42 PSIG
7 OR MORE	46 MIN
6	64 MIN
5	94 MIN

For
SRO

Question 84

FIGURE 4


PRESSURE SUPPRESSION PRESSURE
PSP
UNSAFE
SAFE
CTMT
PRESS
(PSIG)
0
1
2
3
4
5
6
14
15
16
17
18
19
20
21
22
SP LEVEL (FT)

For
SRO

Question 85

SECONDARY CONTAINMENT AND FUEL BUILDING CONTROL

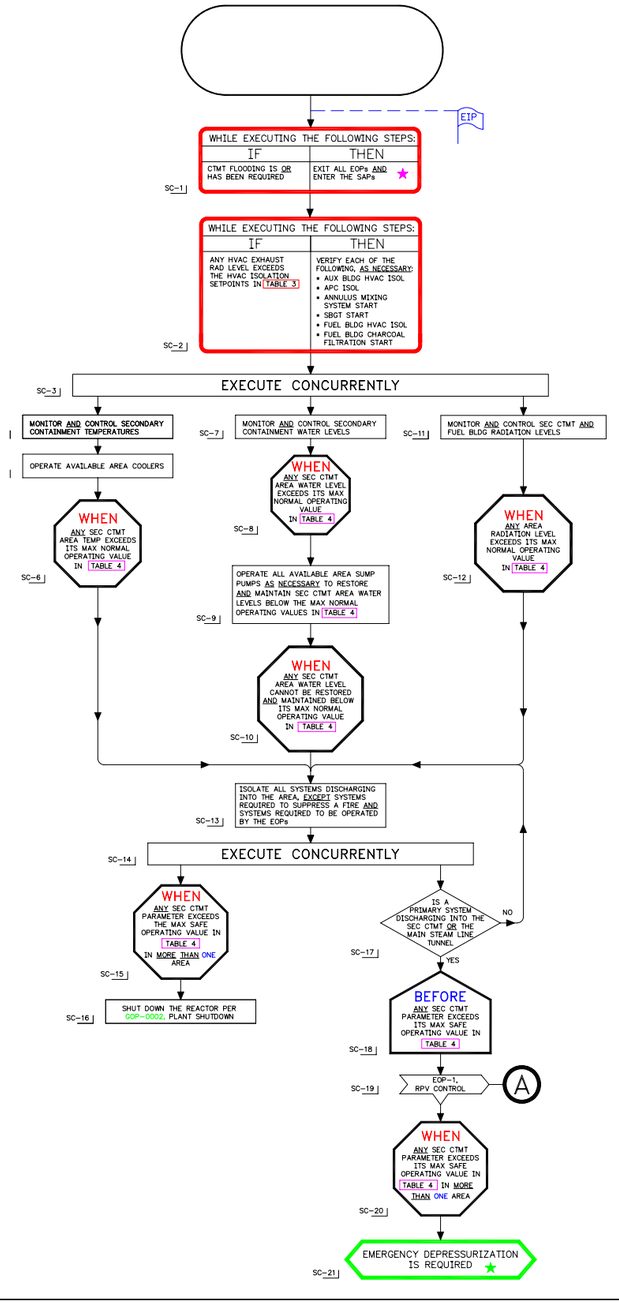


TABLE 3

HVAC ISOLATION SETPOINTS

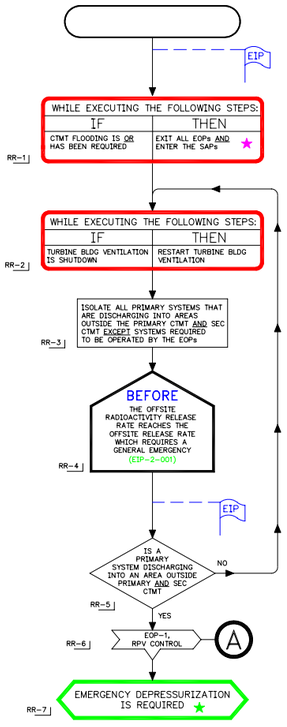
LOCATION		ISOLATION SETPOINT
DIV I ANNULUS VENT	(1011) GRID 2 OR 6	4.32 E-05 µCi/ML
DIV II ANNULUS VENT	(2011) GRID 2 OR 6	4.32 E-05 µCi/ML
AUX BLDG VENT	(1110) GRID 2	6.02 E-03 µCi/ML (MUST BE MANUALLY ISOLATED)
DIV I FUEL BLDG VENT EHX A	(4005) GRID 3 OR 6	1.64 E+03 µCi/S
DIV II FUEL BLDG VENT EHX B	(5005) GRID 3 OR 6	5.29 E-04 µCi/ML

TABLE 4

OPERATING VALUES OF SECONDARY CONTAINMENT AND FUEL BUILDING PARAMETERS

SECONDARY CONTAINMENT PARAMETER		MAX NORMAL OPERATING VALUE	MAX SAFE OPERATING VALUE
AREA TEMPERATURES			
MAIN STEAM LINE TUNNEL		135°F (P601-19A-H1)	200°F
RHR EQUIPMENT AREA 1 (A)		110°F (P601-20A-B5)	200°F
RHR EQUIPMENT AREA 2 (B)		110°F (P601-20A-B5)	200°F
RCIC EQUIPMENT AREA		144°F (P601-21A-H2)	200°F
RWCU PUMP ROOM 1 (A)/2 (B)		145°F (P680-1A-A5)	200°F
HVAC COOLER DIFFERENTIAL TEMPERATURES			
MAIN STEAM LINE TUNNEL		60°F (P601-19A-H2)	NA
RHR EQUIPMENT AREA 1 (A)		22°F (P601-20A-B6)	NA
RHR EQUIPMENT AREA 2 (B)		22°F (P601-20A-B6)	NA
RCIC EQUIPMENT AREA		55°F (P601-21A-H3)	NA
RWCU PUMP ROOM 1 (A)/2 (B)		33°F (P680-1A-A6)	NA
HVAC EXHAUST RADIATION LEVELS			
DIV I ANNULUS VENT	(1011) GRID 2 OR 6	2.16 E-05 µCi/ML (P863-71A-G7)	NA
DIV II ANNULUS VENT	(2011) GRID 2 OR 6	2.16 E-05 µCi/ML (P863-71A-G7)	NA
AUX BLDG VENT	(1110) GRID 2	1.51 E-04 µCi/ML DRMS ALERT	NA
DIV I FUEL BLDG VENT EXH A	(4005) GRID 3 OR 6	4.65 E+01 µCi/S (P863-75A-H1)	NA
DIV II FUEL BLDG VENT EXH B	(5005) GRID 3 OR 6	1.51 E-05 µCi/ML (P863-75A-H3)	NA
AREA RADIATION LEVELS			
HPCS AREA	(1212) GRID 2	8.20 E+01 MR/HR DRMS ALARM	9.5 E+03 MR/HR
RHR EQUIPMENT ROOM A	(1213) GRID 2	8.20 E+01 MR/HR DRMS ALARM	9.5 E+03 MR/HR
RHR EQUIPMENT ROOM B	(1214) GRID 2	8.20 E+01 MR/HR DRMS ALARM	9.5 E+03 MR/HR
RHR EQUIPMENT ROOM C	(1215) GRID 2	8.20 E+01 MR/HR DRMS ALARM	9.5 E+03 MR/HR
LPCS EQUIPMENT ROOM	(1216) GRID 2	8.20 E+01 MR/HR DRMS ALARM	9.5 E+03 MR/HR
HPCS PENETRATION AREA	(1217) GRID 2	8.20 E+01 MR/HR DRMS ALARM	9.5 E+03 MR/HR
LPCS PENETRATION AREA	(1218) GRID 2	8.20 E+01 MR/HR DRMS ALARM	9.5 E+03 MR/HR
RCIC EQUIPMENT ROOM	(1219) GRID 2	1.20 E+02 MR/HR DRMS ALARM	9.5 E+03 MR/HR
AREA WATER LEVELS			
AUX BLDG FL DR SUMP TK5A(B) CRESENT AREA		41 IN. (P870-51A-E1/E2)	6 IN. ABOVE FLOOR (MUST BE VERIFIED LOCALLY)
HPCS ROOM FLOOR DRAIN SUMP LEVEL		30 5/8 IN. (P870-51A-G3)	4 IN. ABOVE FLOOR (40%) (P870-51A-G4)
RHR A ROOM WATER LEVEL		30 5/8 IN. (P870-51A-G3)	4 IN. ABOVE FLOOR (40%) (P870-51A-G4)
RHR B ROOM WATER LEVEL		30 5/8 IN. (P870-51A-G3)	4 IN. ABOVE FLOOR (40%) (P870-51A-G4)
RHR C ROOM WATER LEVEL		32 1/8 IN. (P870-51A-G3)	4 IN. ABOVE FLOOR (40%) (P870-51A-G4)
RCIC ROOM WATER LEVEL		32 1/8 IN. (P870-51A-G3)	4 IN. ABOVE FLOOR (40%) (P870-51A-G4)
LPCS ROOM WATER LEVEL		32 1/8 IN. (P870-51A-G3)	4 IN. ABOVE FLOOR (40%) (P870-51A-G4)
DIFFERENTIAL PRESSURES			
ANNULUS		-3.0 IN. WC (P863-72A-A1)	NA
AUX BLDG		0.0 IN. WC	NA
FUEL BLDG		0.0 IN. WC	NA

RADIOACTIVITY RELEASE CONTROL



EOP-3

SECONDARY CONTAINMENT AND RADIOACTIVE RELEASE CONTROL

RIVER BEND STATION

REVISION 13

For
SRO

Question 86

ALARM NO. 0525	ANNULUS PRESSURE HIGH	H13-P863/72A/A01

INITIATING DEVICES

1. HVR-PDS248

SETPOINTS

1. 3.4 in. WC DEC

AUTOMATIC ACTIONS

1. None

OPERATOR ACTIONS

NOTE

LMS-PT126 measures annulus pressure relative to auxiliary building pressure. In order to determine annulus pressure relative to the environment, the reading from LMS-PT126 must be added to HVR-PDI247 (Aux. Bldg. Press.).

1. Monitor LMS-PT126 on H13-P863 to verify annulus pressure.
2. Monitor ERIS computer point CMSBX021 to verify low differential pressure condition.

LONG TERM ACTIONS

1. Verify proper operation of the Annulus Pressure Control System:
   a. If HVR-FN16A(B) ANNULUS PRESS CONT FAN is running, verify associated HVR-AOD67A(B) EXH FAN DAMPER is modulating.
   b. If HVR-FN16A(B) ANNULUS PRESS CONT FAN is not running, verify associated HVR-AOD67A(B) EXH FAN DAMPER is closed; monitor ERIS computer points HVRBX016 for HVR-FN16A and HVRBX017 for HVR-FN16B.
2. Verify proper operation of the Annulus Mixing System if running.
3. Refer to STP-000-0001 to verify if building pressure is within T.S. limits.
4. Refer to Technical Specification 3.6.4.1 for the Secondary Containment Integrity LCO.
5. Inspect for possible leaks into the Containment.
6. Entry into EOP-0003 may be required.

POSSIBLE CAUSES

1. Improper operation of the Annulus Pressure Control System.
2. Improper operation of the Annulus Mixing System with Standby Gas Treatment if this system is being utilized to control Annulus pressure due to Annulus Pressure Control System low flow.
3. HVR-AOD67A(B) EXH FAN DAMPER modulating dampers not operating properly.
4. Instrument malfunction.
5. Air leak into Annulus.

REFERENCES

1. 1.ILHVR.018
2. P&ID 22-1C

DAILY OPERATING LOGS

Step No.	Instrument	Night Panel Numbers	Limits	Day Panel Numbers
92	Corrected Annulus pressure LMS-TR127 HVR-PDI247 OR HVR-PDI273	P863 _____ + _____ = _____ Ann Pressure LMS-TR127 / Aux Bldg Pressure HVR-PDI247 OR HVR-PDI273 / Corrected Annulus Pressure		Corrected Annulus Pressure less than – 3.40 INWG or in the ACCEPTABLE zone of Attachment 4
93	Fuel Bldg HVF-FLT2	A P863 Yes / No / NA B P863 Yes / No / NA	One operating if moving recently irradiated fuel in Fuel Bldg.	A P863 Yes / No / NA B P863 Yes / No / NA
94	Stby Cooling Tower (SBCT) Temp (see*)	P869 _____ °F	< 88°F. IF SBCT temperature ≤ 60°F, THEN see** below.	

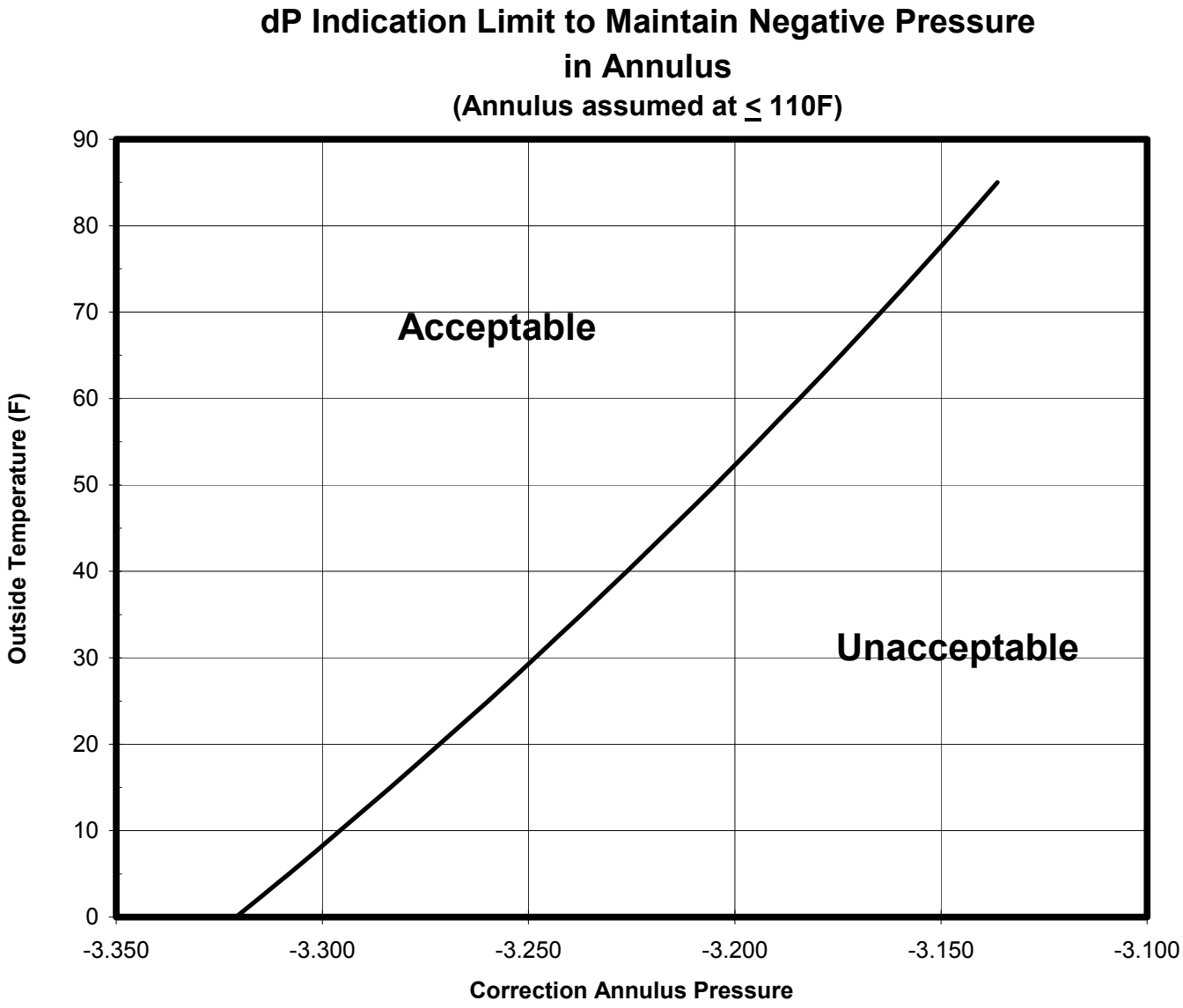
* IF Wide Range Avg. Temp is 70° to 85°F, THEN record Narrow Range Avg. Temp.
IF Wide Range Avg. Temp is < 70°F or > 85°F, THEN record Wide Range Avg. Temp.

** IF Standby Cooling Tower Basin Temp is ≤ 60°F, THEN notify OSM/CRS to take actions to restore SWP-PVY32A, B, C, and D if Gagged Open prior to the temperature in the Standby Cooling Tower Basin reaching 55°F to maintain HVK operability.

IF Tamaris is not available to monitor Standby Cooling Tower Temperature, THEN perform the following:
1. Install the appropriate M&TE at the local thermocouple wires in the South and West quadrants.
2. Get two temperature readings in each quadrant, one with the thermocouple at existing depth the second by pulling the thermocouple above EL. 94' MSL (approximately two to three feet from top)
3. Record the average temperature.
4. Disconnect the M&TE installed in Step #1. _____ (1) + _____ (2) + _____ (3) + _____ (4) = _____ TOTAL = _____ TOTAL / 4 = _____ AVG

		P841	P842		P841	P842
95	SBCT level SWP-ESX	167	164	Verify Standby Cooling Tower (SBCT) level ≥ 78% (111'10")		
96	PVLCS Press LSV-ESX9	A	B	T.S. ≥ 101 psig Range ≥ 106.5 and ≤ 132 psig		
97	Cont/Ann ΔP HVR-ESZ60	A	B	Within 2.0 inches		
	HVR-ESX60	C / E	D / F			
98	RHR C Pump Rm RHS-ES50	A	B	≤122°F	A	B
	RPCCW Area RHS-ES54	A	B	≤122°F	A	B
	RHR Equip Rm Cube (East) RHS-ES55	A	B	≤122°F	A	B
	RHR Equip Rm Cube (West) RHS-ES56	A	B	≤122°F	A	B
99	Cont Press CMS-ES45	A P819	B P820	- 0.3 to + 0.3 psig	A P819	B P820

DP INDICATION LIMIT TO MAINTAIN NEGATIVE PRESSURE IN ANNULUS



3.6 CONTAINMENT SYSTEMS

3.6.4.1 Secondary Containment–Operating

LCO 3.6.4.1 The shield building and auxiliary building shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Secondary containment inoperable.	A.1 Restore secondary containment to OPERABLE status.	4 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1.1	Verify shield building annulus and auxiliary building vacuum is $\geq$ 3.0 and $\geq$ 0.0 inch of vacuum water gauge, respectively.	24 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.4.1.2	Verify all secondary containment equipment hatches are closed and sealed and loop seals filled.	31 days
SR 3.6.4.1.3	Verify each secondary containment access door is closed, except when the access opening is being used for entry and exit.	31 days
SR 3.6.4.1.4	Verify each standby gas treatment (SGT) subsystem will draw down the shield building annulus and auxiliary building to $\geq$ 0.5 and $\geq$ 0.25 inch of vacuum water gauge in $\leq$ 18.5 and $\leq$ 34.5 seconds, respectively.	18 months on a STAGGERED TEST BASIS
SR 3.6.4.1.5	Deleted	Not Applicable
SR 3.6.4.1.6	Verify each SGT subsystem can maintain $\geq$ 0.5 and $\geq$ 0.25 inch of vacuum water gauge in the shield building annulus and auxiliary building, respectively, for 1 hour.	18 months on a STAGGERED TEST BASIS
SR 3.6.4.1.7	Deleted	Not Applicable

For
SRO

Question 90

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources–Operating

LCO 3.8.4 The Division I, Division II, and Division III DC electrical power subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Division I or II DC electrical power subsystem inoperable.	A.1 Restore Division I and II DC electrical power subsystems to OPERABLE status.	2 hours
B. Division III DC electrical power subsystem inoperable.	B.1 Declare High Pressure Core Spray System and Standby Service Water System pump 2C inoperable.	Immediately
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 3.8.4.1	Verify battery terminal voltage is ≥ 130.2 V on float charge.	7 days
SR 3.8.4.2	Verify no visible corrosion at battery terminals and connectors. OR Verify battery connection resistance is ≤ 1.5 E-4 ohm for inter-cell connections, ≤ 1.5 E-4 ohm for inter-rack connections, ≤ 1.5 E-4 ohm for inter-tier connections, and ≤ 1.5 E-4 ohm for terminal connections.	92 days
SR 3.8.4.3	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration.	18 months
SR 3.8.4.4	Remove visible corrosion, and verify battery cell to cell and terminal connections are coated with anti-corrosion material.	18 months
SR 3.8.4.5	Verify battery connection resistance is ≤ 1.5 E-4 ohm for inter-cell connections, ≤ 1.5 E-4 ohm for inter-rack connections, ≤ 1.5 E-4 ohm for inter-tier connections, and ≤ 1.5 E-4 ohm for terminal connections.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.6	Verify each battery charger supplies ≥ 300 amps for chargers 1A and 1B and ≥ 50 amps for charger 1C at ≥ 130.2 V for ≥ 8 hours.	18 months
SR 3.8.4.7	----------NOTES---------- 1. SR 3.8.4.8 may be performed in lieu of SR 3.8.4.7 once per 60 months. 2. This Surveillance shall not be performed in MODE 1, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.8	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR. ----------	
	Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test.	60 months AND ---------NOTE------- Only applicable when battery shows degradation or has reached 85% of expected life. ---------- 18 months

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.4 DC Sources–Operating

BASES

BACKGROUND

The station DC electrical power system provides the AC emergency power system with control power. It also provides both motive and control power to selected safety related equipment. As required by 10 CFR 50, Appendix A, GDC 17 (Ref. 1), the DC electrical power system is designed to have sufficient independence, redundancy, and testability to perform its safety functions, assuming a single failure. The DC electrical power system also conforms to the requirements of Regulatory Guide 1.6 (Ref. 2) and IEEE-308 (Ref. 3).

The 125 VDC electrical power system consists of three independent Class 1E DC electrical power subsystems, Divisions I, II, and III. Each subsystem consists of a battery, associated battery charger(s), and all the associated control equipment and interconnecting cabling.

During normal operation, the DC loads are powered from the battery chargers with the batteries floating on the system. In case of loss of normal power to the battery charger, the DC loads are automatically powered from the Engineered Safety Feature (ESF) batteries.

Each of the Division I and II electrical power subsystems provides the control power for its associated Class 1E AC power load group, 4.16 kV switchgear, and 480 V load centers. Also, these DC subsystems provide DC electrical power to the inverters, which in turn power the AC vital buses. The Division III DC electrical power subsystem provides DC motive and control power as required for the High Pressure Core Spray (HPCS) System diesel generator (DG) set control and protection.

The DC power distribution system is described in more detail in Bases for LCO 3.8.9, "Distribution Systems–Operating," and LCO 3.8.10, "Distribution Systems–Shutdown."

Each Division I and II battery has adequate storage capacity to carry the required load continuously for at least 4 hours as discussed in the USAR, Section 8.3.2 (Ref. 4).

(continued)

BASES

BACKGROUND (continued)

The Division III battery has adequate storage to carry the required load continuously for at least 2 hours (Ref. 4).

Each DC battery subsystem is separately housed in a ventilated room apart from its charger and distribution centers. Each subsystem is located in an area separated physically and electrically from the other subsystems to ensure that a single failure in one subsystem does not cause a failure in a redundant subsystem. There is no sharing between redundant Class 1E subsystems such as batteries, battery chargers, or distribution panels.

The batteries for a DC electrical power subsystem are sized to produce required capacity at 80% of nameplate rating while maintaining system voltage.

Each battery charger of Division I and II DC electrical power subsystems has ample power output capacity for the steady state operation of connected loads required during normal operation, while at the same time maintaining its battery bank fully charged. Each battery charger has sufficient capacity to restore the battery bank from the design minimum charge to its fully charged state within 24 hours while supplying normal steady state loads (Ref. 4).

The battery charger of Division III DC electrical power subsystem has sufficient capacity to restore the battery bank from the design minimum charge to its fully charged state in 8 hours while supplying normal steady state loads (Ref. 4).

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the USAR, Chapter 6 (Ref. 5) and Chapter 15 (Ref. 6), assume that ESF systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation.

The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining DC sources OPERABLE during accident conditions in the event of:

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

a. An assumed loss of all offsite AC power or of all onsite AC power; and

b. A worst case single failure.

The DC sources satisfy Criterion 3 of the NRC Policy Statement.

LCO

The DC electrical power subsystems, each subsystem consisting of one battery, one battery charger, and the corresponding control equipment and interconnecting cabling supplying power to the associated bus within the divisions, are required to be OPERABLE to ensure the availability of the required power to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence (AOO) or a postulated DBA. Loss of any DC electrical power subsystem does not prevent the minimum safety function from being performed (Ref. 4).

APPLICABILITY

The DC electrical power sources are required to be OPERABLE in MODES 1, 2, and 3 to ensure safe unit operation and to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and

b. Adequate core cooling is provided, and containment integrity and other vital functions are maintained in the event of a postulated DBA.

The DC electrical power requirements for MODES 4 and 5 are addressed in the Bases for LCO 3.8.5, "DC Sources–Shutdown."

ACTIONS

A.1

Condition A represents one division with a loss of ability to completely respond to an event, and a potential loss of ability to remain energized during normal operation. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for complete

(continued)

BASES

ACTIONS

A.1 (continued)

loss of DC power to the affected division. The 2 hour limit is consistent with the allowed time for an inoperable DC distribution system division.

If one of the required Division I or II DC electrical power subsystems is inoperable (e.g., inoperable battery, inoperable battery charger, or inoperable battery charger and associated inoperable battery), the remaining DC electrical power subsystems have the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst case single failure could, however, result in the loss of minimum necessary DC electrical subsystems, continued power operation should not exceed 2 hours. The 2 hour Completion Time is based on Regulatory Guide 1.93 (Ref. 7) and reflects a reasonable time to assess unit status as a function of the inoperable DC electrical power subsystem and, if the DC electrical power subsystem is not restored to OPERABLE status, to prepare to effect an orderly and safe unit shutdown.

B.1

With the Division III DC electrical power subsystem inoperable, the HPCS and Standby Service Water System pump 2C may be incapable of performing their intended functions and must be immediately declared inoperable. This declaration also requires entry into applicable Conditions and Required Actions of LCO 3.5.1, "ECCS – Operating," and LCO 3.7.1, "Standby Service Water (SSW) System and Ultimate Heat Sink (UHS)."

C.1 and C.2

If the DC electrical power subsystem cannot be restored to OPERABLE status within the associated Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

conditions from full power conditions in an orderly manner and without challenging plant systems. The Completion Time to bring the unit to MODE 4 is consistent with the time required in Regulatory Guide 1.93 (Ref. 7).

SURVEILLANCE REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge helps to ensure the effectiveness of the charging system and the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery (or battery cell) and maintain the battery (or battery cell) in a fully charged state. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the initial voltages assumed in the battery sizing calculations. The 7 day Frequency is consistent with manufacturer's recommendations and IEEE-450 (Ref. 8).

SR 3.8.4.2

Visual inspection to detect corrosion of the battery cells and connections, or measurement of the resistance of each inter-cell, inter-rack, inter-tier, and terminal connection, provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. Only those terminals and connectors which have visible corrosion must be measured for connection resistance.

The Surveillance Frequency for these inspections, which can detect conditions that can cause power losses due to resistance heating, is 92 days. This Frequency is considered acceptable based on operating experience related to detecting corrosion trends.

SR 3.8.4.3

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.3 (continued)

The 18 month Frequency of the Surveillance is based on engineering judgement, taking into consideration the desired unit conditions to perform the Surveillance. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.8.4.4 and SR 3.8.4.5

Visual inspection and resistance measurements of inter-cell, inter-rack, inter-tier, and terminal connections provides an indication of physical damage or abnormal deterioration that could indicate degraded battery condition. The anti-corrosion material is used to ensure good electrical connections and to reduce terminal deterioration. The visual inspection for corrosion is not intended to require removal of and inspection under each terminal connection.

The removal of visible corrosion is a preventive maintenance SR. The presence of visible corrosion does not necessarily represent a failure of this SR, provided visible corrosion is removed during performance of this Surveillance.

The 18 month Frequency of the Surveillance is based on engineering judgement, taking into consideration the desired unit conditions to perform the Surveillance. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.8.4.6

Battery charger capability requirements are based on the design capacity of the chargers (Ref. 4). According to Regulatory Guide 1.32 (Ref. 9), the battery charger supply is required to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.4.6 (continued)

the fully charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensure that these requirements can be satisfied. Momentary transients that are not attributable to charger performance do not invalidate this test.

The Surveillance Frequency is acceptable, given the unit conditions required to perform the test and the other administrative controls existing to ensure adequate charger performance during these 18 month intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

SR 3.8.4.7

A battery service test is a special test of the battery's capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length correspond to the design duty cycle requirements as specified in Reference 4.

The Surveillance Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.32 (Ref. 9) and Regulatory Guide 1.129 (Ref. 10), which state that the battery service test should be performed during refueling operations or at some other outage, with intervals between tests not to exceed 18 months.

This SR is modified by two Notes. Note 1 allows the once per 60 months performance of SR 3.8.4.8 in lieu of SR 3.8.4.7. This substitution is acceptable because the battery performance test (SR 3.8.4.8) represents a more severe test of battery capacity than the battery service test (SR 3.8.4.7). Because both the battery service test and the battery performance test involve battery capacity determination, complete battery replacement invalidates the previous performance of these surveillance requirements. In addition to requiring the re-performance of both of these surveillance tests prior to declaring the battery OPERABLE, complete battery replacement also resets the 60 month time period used for substitution of the service test by the performance test. For this reason, substitution is acceptable for performance testing conducted within the first two years of service of a new battery as required by Reference 8. The reason for Note 2 is that performing the Surveillance would remove a required DC electrical power subsystem from service, perturb the electrical distribution system, and challenge safety systems. Credit may be taken for unplanned events that satisfy the Surveillance. Examples of unplanned events may include:

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.7 (continued)

2) Post corrective maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

SR 3.8.4.8

A battery performance test is a test of constant current capacity of a battery, normally done in the as found condition, after having been in service, to detect any change in the capacity determined by the acceptance test. The test is intended to determine overall battery degradation due to age and usage.

The acceptance criteria for this Surveillance is consistent with IEEE-450 (Ref. 8) and IEEE-485 (Ref. 11). These references recommend that the battery be replaced if its capacity is below 80% of the manufacturer's rating. A capacity of 80% shows that the battery rate of deterioration is increasing, even if there is ample capacity to meet the load requirements.

The Surveillance Frequency for this test is normally 60 months. If the battery shows degradation, or if the battery has reached 85% of its expected life the Surveillance Frequency is reduced to 18 months. Degradation is indicated, according to IEEE-450 (Ref. 8), when the battery capacity drops by more than 10% of rated capacity from its average on previous tests, or when it is $\geq$ 10% below the manufacturer's rating. These Frequencies are based on the recommendations in IEEE-450 (Ref. 8).

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required DC electrical power subsystem from service, perturb the electrical distribution system, and challenge safety systems. Credit may be taken for unplanned events that satisfy the Surveillance. Examples of unplanned events may include:

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.8 (continued)

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2) Post corrective maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. Regulatory Guide 1.6, March 10, 1971.
3. IEEE Standard 308, 1978.
4. USAR, Section 8.3.2.
5. USAR, Chapter 6.
6. USAR, Chapter 15.
7. Regulatory Guide 1.93, December 1974.
8. IEEE Standard 450, 1975.
9. Regulatory Guide 1.32, February 1977.
10. Regulatory Guide 1.129, December 1974.
11. IEEE Standard 485.

For
SRO

Question 91

3.7 PLANT SYSTEMS

3.7.1 Standby Service Water (SSW) System and Ultimate Heat Sink (UHS)

LCO 3.7.1 Two SSW subsystems and the UHS shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One division with one UHS cooling tower fan cell inoperable.	A.1 Restore cooling tower fan cell to OPERABLE status.	30 days
B. Both divisions with one UHS cooling tower fan cell inoperable.	B.1 Restore one cooling tower fan cell to OPERABLE status.	7 days
C. One division with both UHS cooling tower fan cells inoperable.	C.1 Declare associated SSW subsystem inoperable.	Immediately
D. UHS basin inoperable.	D.1 Restore UHS basin to OPERABLE status.	72 hours
E. One SSW subsystem with one pump inoperable.	E.1 Restore pump to OPERABLE status.	30 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Two SSW subsystems with one pump inoperable.	F.1 Restore one pump to OPERABLE status.	7 days
G. One SSW subsystem inoperable for reasons other than Condition E or F.	----------NOTES---------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources - Operating," for diesel generator made inoperable by SSW. 2. Enter applicable Conditions and Required Actions of LCO 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown," for RHR shutdown cooling subsystem made inoperable by SSW. ---------- G.1 Restore SSW subsystem to OPERABLE status.	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. Required Action and associated Completion Time of Condition A, B, D, E, F, or G not met. OR Both SSW subsystems inoperable for reasons other than Condition F. OR Three or four UHS cooling tower fan cells inoperable.	H.1 Be in MODE 3. AND H.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Verify the water level of UHS cooling tower basin is $\geq$ 78%.	24 hours
SR 3.7.1.2	Verify the average water temperature of UHS is $\leq$ 88°F.	24 hours
SR 3.7.1.3	Operate each cooling tower fan cell for $\geq$ 15 minutes.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.1.4	Verify each required SSW subsystem manual, power operated, and automatic valve in the flow path servicing safety related systems or components, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.7.1.5	Verify each SSW subsystem actuates on an actual or simulated initiation signal.	18 months

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources–Operating

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

a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electric Power Distribution System; and

b. Three diesel generators (DGs).

APPLICABILITY: MODES 1, 2, and 3.

----------NOTE----------
Division III AC electrical power sources are not required to be OPERABLE when High Pressure Core Spray System and Standby Service Water System pump 2C are inoperable.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	A.1 Perform SR 3.8.1.1 for OPERABLE required offsite circuit. AND	1 hour AND Once per 8 hours thereafter (continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2 Restore required offsite circuit to OPERABLE status.	72 hours AND 24 hours from discovery of two divisions with no offsite power AND 17 days from discovery of failure to meet LCO
B. One required DG inoperable.	B.1 Perform SR 3.8.1.1 for OPERABLE required offsite circuit(s).	1 hour AND Once per 8 hours thereafter
	AND	
	B.2 Declare required feature(s), supported by the inoperable DG, inoperable when the redundant required feature(s) are inoperable.	4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)
	AND	

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.3.1 Determine OPERABLE DG(s) are not inoperable due to common cause failure. OR B.3.2 Perform SR 3.8.1.2 for OPERABLE DG(s). AND B.4 Restore required DG to OPERABLE status.	24 hours 24 hours 72 hours from discovery of an inoperable Division III DG AND 14 days AND 17 days from discovery of failure to meet LCO
C. Two required offsite circuits inoperable.	C.1 Declare required feature(s) inoperable when the redundant required feature(s) are inoperable. AND C.2 Restore one required offsite circuit to OPERABLE status.	12 hours from discovery of Condition C concurrent with inoperability of redundant required feature(s) 24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. One required offsite circuit inoperable. AND One required DG inoperable.	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems–Operating," when any division is de-energized as a result of Condition D. ----------		
	D.1	Restore required offsite circuit to OPERABLE status.	12 hours
	OR		
	D.2	Restore required DG to OPERABLE status.	12 hours
E. Two required DGs inoperable.	E.1	Restore one required DG to OPERABLE status.	2 hours OR 24 hours if Division III DG is inoperable
F. Required Action and Associated Completion Time of Condition A, B, C, D, or E not met.	F.1	Be in MODE 3.	12 hours
	AND		
	F.2	Be in MODE 4.	36 hours
G. Three or more required AC sources inoperable.	G.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each required offsite circuit.	7 days
SR 3.8.1.2	----------NOTES---------- 1. Performance of SR 3.8.1.7 satisfies this SR. 2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 3. A modified DG start involving gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met. ---------- Verify each DG starts from standby conditions and achieves: a. For DG 1A and DG 1B, steady state voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz. b. For DG 1C: 1. Maximum of 5400 V, and 66.75 Hz, and 2. Steady state voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.3	----------NOTES---------- 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by, and immediately follow, without shutdown, a successful performance of SR 3.8.1.2 or SR 3.8.1.7 ---------- Verify each DG operates for ≥ 60 minutes at a load ≥ 3000 kW and ≤ 3100 kW for DG 1A and DG 1B, and ≥ 2500 kW and ≤ 2600 kW for DG 1C.	31 days
SR 3.8.1.4	Verify each day tank contains ≥ 316.3 gal of fuel oil.	31 days
SR 3.8.1.5	Check for and remove accumulated water from each day tank.	31 days
SR 3.8.1.6	Verify the fuel oil transfer system operates to automatically transfer fuel oil from the storage tank to the day tank.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.7	----------NOTE---------- All DG starts may be preceded by an engine prelube period. ---------- Verify each DG starts from standby conditions and achieves: a. For DG 1A and DG 1B, steady state voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz, in ≤ 10 seconds. b. For DG 1C: 1. Maximum of 5400 V, and 66.75 Hz, and 2. Steady state voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz, in ≤ 13 seconds.	184 days
SR 3.8.1.8	----------NOTE---------- This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify manual transfer of unit power supply from the normal offsite circuit to required alternate offsite circuit.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	----------NOTE---------- 1. Credit may be taken for unplanned events that satisfy this SR. 2. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9 ---------- Verify each DG rejects a load greater than or equal to its associated single largest post accident load and following load rejection, the engine speed is maintained less than nominal plus 75% of the difference between nominal speed and the overspeed trip setpoint or 15% above nominal, whichever is lower.	18 months
SR 3.8.1.10	----------NOTE---------- Credit may be taken for unplanned events that satisfy this SR. ---------- Verify each DG operating at a power factor ≤ 0.9 does not trip and voltage is maintained ≤ 4784 V for DG 1A and DG 1B and ≤ 5400 V for DG 1C during and following a load rejection of a load ≥ 3030 kW and ≤ 3130 kW for DGs 1A and 1B and ≥ 2500 kW and ≤ 2600 kW for DG 1C.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.11	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses; b. Load shedding from emergency buses for Divisions I and II; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C, 2. energizes auto-connected shutdown loads, 3. maintains steady state voltage ≥ 3740 V and ≤ 4580 V, 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.12	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1 or 2. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify on an actual or simulated Emergency Core Cooling System (ECCS) initiation signal each DG auto-starts from standby condition and: a. For DG 1C during the auto-start maintains voltage ≤ 5400 V and frequency ≤ 66.75 Hz; b. In ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C after auto-start and during tests, achieves voltage ≥ 3740 V and ≤ 4580 V; c. In ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C after auto-start and during tests, achieves frequency ≥ 58.8 Hz and ≤ 61.2 Hz; and d. Operates for ≥ 5 minutes.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.13	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify each DG's automatic trips are bypassed on an actual or simulated ECCS initiation signal except: a. Engine overspeed; and b. Generator differential current.	18 months
SR 3.8.1.14	----------NOTES---------- 1. Momentary transients outside the load and power factor ranges do not invalidate this test. 2. Credit may be taken for unplanned events that satisfy this SR. ---------- Verify each DG operating at a power factor $\leq$ 0.9, operates for $\geq$ 24 hours: a. For DG 1A and DG 1B loaded $\geq$ 3030 kW and $\leq$ 3130 kW; and b. For DG 1C: 1. For $\geq$ 2 hours loaded $\geq$ 2750 kW and $\leq$ 2850 kW, and 2. For the remaining hours of the test loaded $\geq$ 2500 kW and $\leq$ 2600 kW.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.15	----------NOTES---------- 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 1 hour loaded ≥ 3000 kW and ≤ 3100 kW for DG 1A and DG 1B, and ≥ 2500 kW and ≤ 2600 for DG 1C, or operating temperatures have stabilized, which ever is longer. Momentary transients outside of the load range do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period. --- Verify each DG starts and achieves, in ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C, voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	18 months
SR 3.8.1.16	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. --- Verify each DG: a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power; b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.17	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. ----------	
	Verify, with a DG operating in test mode and connected to its bus, an actual or simulated ECCS initiation signal overrides the test mode by: a. Returning DG to ready-to-load operation; and b. Automatically energizing the emergency loads from offsite power.	18 months
SR 3.8.1.18	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. ----------	
	Verify sequence time is within ± 10% of design for each load sequencer timer.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.19	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses for Divisions I and II; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C, 2. energizes auto-connected emergency loads, 3. achieves steady state voltage ≥ 3740 V and ≤ 4580 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.20	----------NOTE---------- All DG starts may be preceded by an engine prelube period. ----------	
	Verify, when started simultaneously from standby condition, each DG achieves, in ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C, voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	10 years

For
SRO

Question 97

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.5 RCS Operational LEAKAGE

LCO 3.4.5 RCS operational LEAKAGE shall be limited to:

a. No pressure boundary LEAKAGE;

b. ≤ 5 gpm unidentified LEAKAGE;

c. ≤ 30 gpm total LEAKAGE averaged over the previous 24 hour period; and

d. ≤ 2 gpm increase in unidentified LEAKAGE within the previous 24 hour period in MODE 1.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Unidentified LEAKAGE not within limit. OR Total LEAKAGE not within limit.	A.1 Reduce LEAKAGE to within limits.	4 hours
B. Unidentified LEAKAGE increase not within limit.	B.1 Verify source of unidentified LEAKAGE increase is not service sensitive type 304, type 316 austenitic stainless steel, or other intergranular stress corrosion cracking susceptible material.	4 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met. OR Pressure boundary LEAKAGE exists.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	12 hours 36 hours

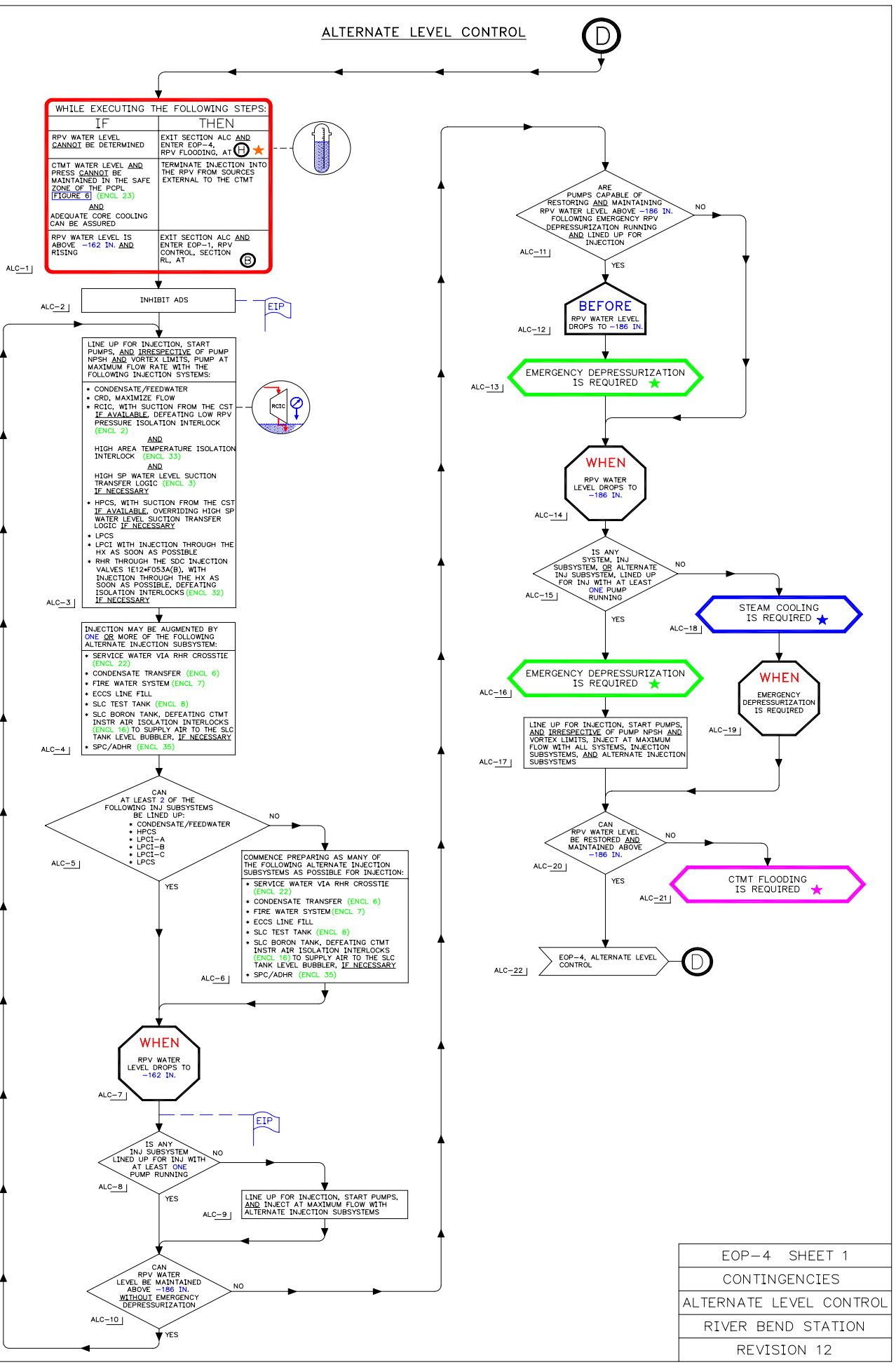
SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Verify RCS unidentified LEAKAGE, total LEAKAGE, and unidentified LEAKAGE increase are within limits.	12 hours

For
SRO

Question 100

ALTERNATE LEVEL CONTROL



STEAM COOLING