FACILITY NAME: St. Lucie Section 3

REPORT NUMBER: 2009-301

DRAFT SRO WRITTEN EXAM

CONTENTS:

☐ **Draft SRO Written Exam (25Q with ES-401-5 Information)**

Location of Electronic Files:

Submitted By: _____ Verified By: _____

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	007EG2.4.20	
	Importance Rating		4.3

Reactor Trip Stabilization – Recovery: Knowledge of operational implications of EOP warnings, cautions and notes

Proposed Question: SRO 76

I/C was performing a AFAS surveillance on Unit 2 while at 100% power when an inadvertent AFAS-1 occurred. The crew is implementing 2-EOP-01 Standard Post Trip Actions with the following:

- The 2B3 4.16KVAC bus did NOT transfer to the startup transformers and the 2B Diesel Generator did NOT start.
- RCS subcooling is 15°F.
- RCS pressure is 1780 psia and lowering.

While performing 2-EOP-01 which of the following directions CAN be given to the crew and why?

A. Override and open Main Feedwater isolation valves on the 'A' side. Actions are to be taken to maintain or regain safety functions.

B. Manually start the 2B Diesel Generator from the RTGB. To ensure redundant power available in the event of single train failure of equipment and / or components.

C. Cooldown the RCS to regain minimum subcooling. Actions are to be taken to maintain or regain safety functions.

D. Manually actuating SIAS. If actuation setpoint inevitable, manual actuation will ensure SIAS and all its components have actuated prior to setpoint.

Proposed Answer: B

Explanation (Optional):

A. Incorrect: can be overridden AFTER 2-EOP-01 but not while in 2-EOP-01
B. Correct
C. Incorrect: this was a recent procedure change that doe not allow a cooldown while in 2-EOP-01.
D. Incorrect: manual actuation of any ESFAS in not allowed at PSL. Most other utilities allow and expect manual actuation if reaching setpoint is inevitable.

Technical Reference(s): OPS-521 Emergency Operating Procedure Implementation (Attach if not previously provided)

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0702822-04, 0702822-08 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10
55.43 5

Comments:

Rev 14 8/17/05

1. H. (continued)

3. If a Safety Function is not being met or a contingency action must be taken, that information must be communicated to the US. The US will direct these contingency actions. This communication will utilize 4-parts.

4. Following completion of the Immediate Actions, the SM, US and RCOs should spend approximately one minute assessing plant status and acknowledging alarms.

During this time the Desk RCO should:

a. Announce on the Gaitronics **"Attention all Plant Personnel, the Unit 1 (2) Reactor has tripped."**

b. NOTIFY the NPO to perform Appendix X, Section 1 of EOP-99

c. CONTACT the STA and Shift Communicator to report to the Control Room and

d. Close the MSR TCV block and/or warm-up valves.

e. While the US and BRCO are performing the Inventory and/or Pressure Control safety function, the DRCO should CLOSE MV-08-814.

The US / SM should:

f. Mentally perform EOP-1 to quickly assess the status of the plant.

g. Actions required to stabilize the plant may be taken at that time. (e.g., close an EDG breaker, start a charging pump, manually control S/G pressure)

1. J. (continued)

6. Manual initiation of AFAS should NOT be done during other scenarios because it defeats the rupture identification circuit. This does NOT prevent a crew decision to manually operate AFW components, start pumps and open valves, if deemed necessary.

7. ESFAS Actuation: Use of ESF Override features in EOPs

a. When opening a valve that was closed by SIAS or CIAS, increased awareness / monitoring should be employed on that system to detect a release to the environment via that flow path.

b. Increasing RAB radiation indications, loss of Containment sump inventory and unexpected Containment depressurization are all examples of Containment boundary leakage which may have been created by operator action, and should be considered when taking these type of actions.

K. Manual Override of MFIV Following AFAS Actuation (Unit 2):

1. Do NOT override and open MFIV from within EOP-1. This overrides a safeguard signal prior to diagnosing the event.

L. CCW to RCPs:

1. SPTAs take precedence over restoring CCW.

2. Restore CCW to RCPs when an RCO is available AND the attention required to restore does NOT adversely affect the maintenance or recovery of other safety functions.

M. Excess Steam Demand event guidance while implementing EOP-05, Excess Steam Demand, and EOP-15, Functional Recovery.

1. Regardless of the rate of RCS pressure and inventory reduction during an Excess Steam Demand, RCS pressure SHALL NOT be intentionally lowered to enhance inventory addition into the RCS unless the RCS Inventory Control Safety Function can NOT be maintained otherwise.

2. If a Main Steam Safety Valve is stuck open, or was stuck open, causing entry into an EOP, Then the affected Steam Generator shall be considered faulted until the Safety Valve is gagged, even if the Safety Valve reseats. The Steam Generator shall NOT be unisolated until the Safety Valve is gagged.

Rev 6 W 8/19/13

FPL

ST. LUCIE UNIT 2

EMERGENCY OPERATING PROCEDURE

SAFETY RELATED

CONTINUOUS USE

Procedure No.
2-EOP-01
Current Revision No.
25
Effective Date
11/18/07

FOR INFORMATION ONLY
Before use, verify revision and change documentation (if applicable) with a controlled index or document.
DATE VERIFIED____ INITIAL____

Title:

STANDARD POST TRIP ACTIONS

SPTA

Responsible Department: **OPERATIONS**

REVISION SUMMARY:

Revision 25 - Incorporated PCR 07-3408 for CR 2007-9375 to delete direction to cool down RCS based on losing subcooling. (Joe Hessling, 11/06/07)

Revision 24 - Incorporated PCR 05-2946 to update revision based upon PSTG revision. NO WORD CHANGES MADE. (Joe Hessling, 10/12/05)

Revision 23 - Incorporated PCR 03-2800 to incorporate operator feedback issues. (J. Martin, 11/18/03)

Revision 22 – Incorporated CEN-152, rev 5.2 and allowed procedure to conform with writer's guide. (J. R. Martin, 08/08/02)

Revision 21 – Made grammatical and formatting changes and changed S/G pressure. (Steve Napier, 10/03/01)

AND

THIS PROCEDURE HAS BEEN COMPLETELY REWRITTEN. This procedure has been rewritten to meet CEN 152 Revision 5.1 criteria. (Steve Napier, 08/10/01)

Revision	FRG Review Date	Approved By	Approval Date
0	12/23/85	D. A. Sager Plant General Manager	12/23/85
25	11/06/07	C. Costanzo Plant General Manager	11/06/07
		N/A Authorized Approver	
		N/A Authorized Approver (Minor Correction)	

S_2_OPS	
DATE	
DOCT	PROCEDURE
DOCN	2-EOP-01
SYS	
COM	COMPLETED
ITM	25

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	009EA2.14	
	Importance Rating		4.4

Small Break LOCA: Actions to be taken if PTS limits are violated

Proposed Question: SRO 77

Unit 1 is experiencing a SBLOCA. While in 1-EOP-03 'LOCA', the leak was isolated at 0400.

The following timeline and conditions exist:

Time	0422	0432	0442	0452
RCS Pressure	1720 psia	1750 psia	1820 psia	1830 psia
RCS temperature	425°F	415°F	410°F	400°F
Pressurizer Level	28%	29%	30%	31%

- 1A Charging pump is running, 1B and 1C Charging pumps have been stopped.
- 1A S/G level is 50% NR with AFW at 150 gpm.
- 1B S/G level is 43% NR with AFW at 160 gpm.
- Containment temperature is 110°F.
- SIAS has NOT been reset.

Which of the following states the:

1) Safety function in jeopardy at 0452?
2) Actions required to regain / maintain the jeopardized safety function?

A. 1) Core Heat removal
   2) Stop the cooldown and depressurize the RCS.

B. 1) Core Heat removal
   2) Continue to cooldown NOT to exceed 100°F in any one hour.

C. 1) Pressure control
   2) Continue to cooldown NOT to exceed 100°F in any one hour.

D. 1) Pressure control
   2) Stop the cooldown and depressurize the RCS.

Proposed Answer: D

Explanation (Optional):

A. Incorrect, all criteria is met core heat removal. RCS is >200°F subcooled at 0432. RCS is outside Figure 1A, >200°F subcooled
B. Incorrect, Core Heat removal is met, cooldown will make subcooling worse
C. Incorrect, cooldown will make subcooling worse
D. Correct, RCS is outside Figure 1A, >200°F subcooled

Technical Reference(s): 1-EOP-03 (Attach if not previously provided)
1-EOP-99 Figure 1A

Proposed references to be provided to applicants during examination: 1-EOP-99 Figures 1A and 1B

Learning Objective: 0702824-09 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 _____
55.43 5

Comments:

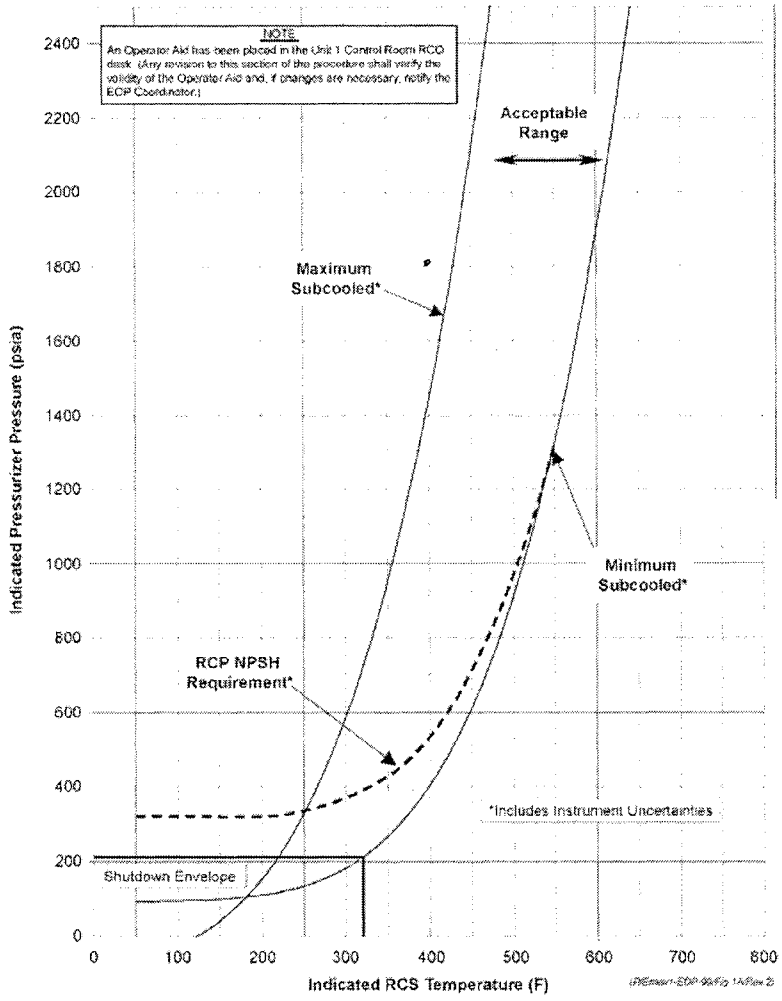
Rev 0'2
8/14/09

FIGURE 1A
RCS PRESSURE TEMPERATURE
(Page 1 of 1)

(Containment Temperature Less Than or Equal to 200°F)

CAUTION

The RCP NPSH curve assumes one pump is operating in each loop. RCP instrumentation should be monitored for seal and pump performance in accordance with 1-EOP-99, Table 13.



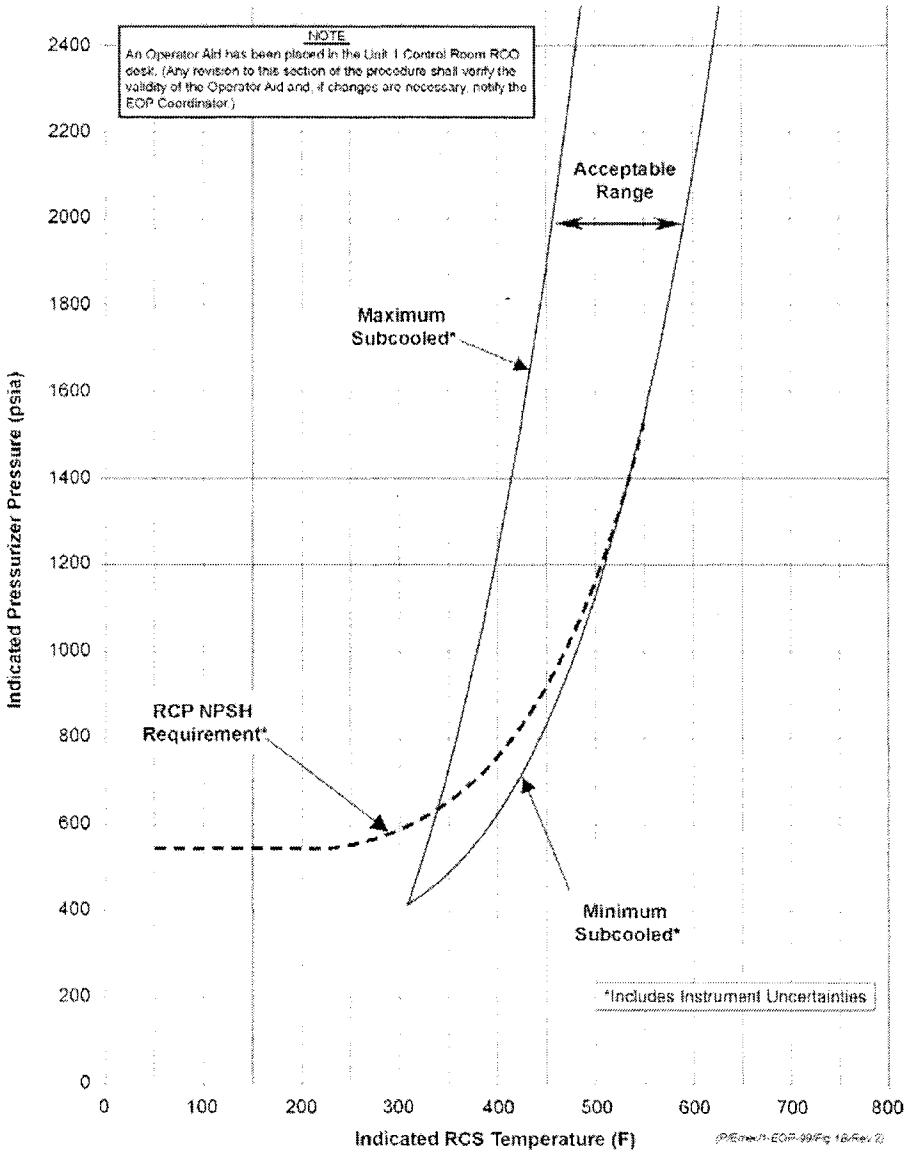
RCS Pressure Range	Required QSPDS Subcooled Margin Reading (Rep CET)
2250 psia to 1000 psia	40 to 180°F
1000 psia to 500 psia	50 to 170°F
Less than 500 psia	80 to 160°F

FIGURE 1B
RCS PRESSURE TEMPERATURE
(Page 1 of 1)

(Containment Temperature Greater Than 200°F)

CAUTION

The RCP NPSH curve assumes one pump is operating in each loop. RCP instrumentation should be monitored for seal and pump performance in accordance with 1-EOP-99, Table 13.



4.0 OPERATOR ACTIONS (continued)

INSTRUCTIONS	CONTINGENCY ACTIONS
[*] **26. Maintain RCS within Figure 1A or 1B Limits** MAINTAIN the RCS less than the upper limits of Figure 1A or 1B, RCS Pressure Temperature, by performing **ANY** of the following: **A.** OPERATE Main or Auxiliary Pressurizer sprays. **B.** If HPSI throttle criteria are met, Then THROTTLE SI flow. **REFER TO** Appendix S, Safety Injection Throttling and Restoration.	**26.1** If the RCS is over-subcooled, or RCS pressure exceeds the upper limits of Figure 1A or 1B, RCS Pressure Temperature, Then RESTORE subcooling or pressure to within the appropriate limit: **A.** STOP the cooldown. **B.** DEPRESSURIZE the RCS using Main or Auxiliary Pressurizer spray. **C.** If HPSI throttle criteria are met, Then THROTTLE SI flow. **REFER TO** Appendix S, Safety Injection Throttling and Restoration. **26.2** If the cooldown rate is greater than 100°F in **ANY** 1 hour period, Then RESTORE the cooldown rate to within its limit: **A.** STOP the cooldown **AS NECESSARY**. **B.** MAINTAIN the plant in a stable pressure-temperature configuration. **C.** CONTINUE the plant cooldown within the 100°F in **ANY** 1 hour period limit.
[*] **27. Maintain S/G Level 60 to 70% NR** ENSURE at least **ONE** S/G has level being maintained or restored to between 60 and 70% NR.	

ATTACHMENT 1
SAFETY FUNCTION STATUS CHECK SHEET
(Page 3 of 11)

3. RCS INVENTORY CONTROL

SAFETY FUNCTION	ACCEPTANCE CRITERIA	CHECK √
A. IF HPSI Throttling Criteria Met:		
Pressurizer Level	At least 30%	☐☐☐☐☐☐
		AND
RCS Subcooling	Greater than or equal to minimum subcooling	☐☐☐☐☐☐
		AND
Reactor Vessel Level	Hot legs covered (sensors 4 through 8 covered)	☐☐☐☐☐☐
		OR
	Less than 20°F difference between T_{HOT} and Rep CET temperature	☐☐☐☐☐☐

OR

⇓

(Continued on Next Page)

ATTACHMENT 1
SAFETY FUNCTION STATUS CHECK SHEET
(Page 4 of 11)

3. RCS INVENTORY CONTROL (continued)

SAFETY FUNCTION	ACCEPTANCE CRITERIA	CHECK √
B. IF HPSI Throttling Criteria NOT Met:		
Charging Pumps	**ALL** available running	☐☐☐☐☐☐
		AND
Safety Injection Flow	In accordance with Figure 2, Safety Injection Flow vs. RCS Pressure	☐☐☐☐☐☐
		OR
	RAS with at least **ONE** HPSI Pump running	☐☐☐☐☐☐
		AND
Reactor Vessel Level	Core covered (sensors 7 and 8 covered)	☐☐☐☐☐☐
		OR
Rep CET temperature	Less than 22°F superheated	☐☐☐☐☐☐

END OF SAFETY FUNCTION 3

ATTACHMENT 1
SAFETY FUNCTION STATUS CHECK SHEET
(Page 5 of 11)

4. RCS PRESSURE CONTROL

SAFETY FUNCTION	ACCEPTANCE CRITERIA	CHECK √
A. RCS pressure	Within limits of Figure 1A or 1B, RCS Pressure Temperature	☐
	OR	
B. Charging Pumps	**ALL** available running	☐
		AND
SI Flow	SI flow in accordance with Figure 2, Safety Injection Flow vs. RCS Pressure	☐
		OR
	RAS with at least **ONE** HPSI Pump running	☐

END OF SAFETY FUNCTION 4

ATTACHMENT 1
SAFETY FUNCTION STATUS CHECK SHEET
(Page 6 of 11)

5. CORE HEAT REMOVAL

SAFETY FUNCTION	ACCEPTANCE CRITERIA	CHECK √
Forced Circ RCS T_{HOT}	Not superheated	☐☐☐☐☐☐
OR		
Natural Circ Rep CET Temperature	Less than 22°F superheated	☐☐☐☐☐☐

END OF SAFETY FUNCTION 5

ATTACHMENT 1
SAFETY FUNCTION STATUS CHECK SHEET
(Page 7 of 11)

6. RCS HEAT REMOVAL

SAFETY FUNCTION	ACCEPTANCE CRITERIA	CHECK √
A. Steam Generator Level	At least **ONE** S/G with level between 60 and 70% NR with Feedwater available	☐☐☐☐☐☐
	OR	
	At least **ONE** S/G with Feedwater being controlled to restore level to between 60 and 70% NR	☐☐☐☐☐☐
	AND	
RCS T_{COLD}	Stable or lowering	☐☐☐☐☐☐

END OF SAFETY FUNCTION 6

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	022AA2.04	
	Importance Rating		3.8

Loss of Rx Coolant Makeup: How long PZR can be maintained within limits

Proposed Question: SRO 78

Unit 2 is performing a Natural Circulation cooldown IAW 2-0120039 'Natural Circulation Cooldown'.

At time 0220 the following conditions were noted:

- Pressurizer pressure is 1620 psia.
- SIAS has been blocked.
- RCS temperature is 490°F and lowering.
- BAM tanks and RWT are NOT available for makeup to the RCS.
- Pressurizer level is 30% and lowering at a rate of 1.2% every 30 minutes.

Based on the above conditions:

1) In accordance with Technical Specifications when is the earliest the Pressurizer would be considered Inoperable and what is the required action if the Pressurizer is declared inoperable?
2) What lineup is available for makeup to the RCS?

A. 1) 0320, be in HOT SHUTDOWN within 6 hours
   2) Safety Injection tanks directly to the suction of the Charging Pumps

B. 1) 0350, be in HOT SHUTDOWN within 6 hours
   2) Safety Injection tanks directly to the VCT to the suction of the Charging Pumps

C. 1) 0320, be in HOT SHUTDOWN within 72 hours
   2) Safety Injection tanks directly to the VCT to the suction of the Charging Pumps

D. 1) 0350, be in HOT SHUTDOWN within 72 hours
   2) Safety Injection tanks directly to the suction of the Charging Pumps

Proposed Answer: B

Explanation (Optional):

A. Incorrect: Time line is incorrect. At 0320 Pressurizer level would be appx. 27.5 % which is above the Technical Specification lower limit.
   Incorrect: SIT lineup is to the VCT not the RWT. Various valves to the RWT are manipulated but lineup is to the VCT.
B. Correct: Pressurizer level would be 26.4% which is lower than T.S. lower limit
   Correct: Lineup is to VCT not RWT
C. Incorrect: Time line is incorrect. At 0320 Pressurizer level would be appx. 27.5 % which is above the Technical Specification lower limit. 72 hour restoration time is only for heater operability.
   Correct: Lineup is to VCT not RWT
D. Correct: Pressurizer level would be 26.4% which is lower than T.S. lower limit. 72 hour restoration time is only for heater operability.
   Incorrect: SIT lineup is to the VCT not the RWT. Various valves to the RWT are manipulated but lineup is to the VCT.

Technical Reference(s): T.S. 3/4.4.3 (Attach if not previously provided)
2-0120039 Natural Circulation Cooldown.

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0902723-01, 0702858-08 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 _____
55.43 5

Comments:

RWO 011 8/14/05

REACTOR COOLANT SYSTEM

3/4.4.3 PRESSURIZER

LIMITING CONDITION FOR OPERATION

3.4.3 The pressurizer shall be OPERABLE with a minimum water level of greater than or equal to 27% indicated level and a maximum water level of less than or equal to 68% indicated level and at least two groups of pressurizer heaters capable of being powered from 1E buses each having a nominal capacity of at least 150 kW.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

a. With one group of the above required pressurizer heaters inoperable, restore at least two groups to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. With the pressurizer otherwise inoperable, be in at least HOT STANDBY with the reactor trip breakers open within 6 hours and in HOT SHUTDOWN within the following 6 hours.

SURVEILLANCE REQUIREMENTS

4.4.3.1 The pressurizer water volume shall be determined to be within its limits at least once per 12 hours.

4.4.3.2 The capacity of each of the above required groups of pressurizer heaters shall be verified to be at least 150 kW at least once per 92 days.

4.4.3.3 The emergency power supply for the pressurizer heaters shall be demonstrated OPERABLE at least once per 18 months by verifying that on an Engineered Safety Features Actuation test signal concurrent with a loss of offsite power:

a. the pressurizer heaters are automatically shed from the emergency power sources, and

b. the pressurizer heaters can be reconnected to their respective buses manually from the control room after resetting of the ESFAS test signal.

7.2 Subsequent Operator Actions (continued)

INSTRUCTIONS	CONTINGENCY ACTIONS
CAUTION After a boron concentration for cold shutdown is attained in the RCS, makeup water added to the RCS during the cooldown should be at least the same boron concentration as in the RCS to prevent any dilution of RCS boron concentration.	
3. §1 BORATE to maintain adequate SDM throughout the RCS cooldown.	**3.** If BAM tanks and RWT are NOT available, the SITs may be used for makeup to the RCS per Appendix A.
4. §1,2,3 PERFORM ALL of the following:	**4.**
NOTE Chemistry Department should be informed of any holds or cooldown rate changes that will affect the frequency of RCS boron concentration sampling. Once sampling begins, at least 15 minutes of lead-time is required to obtain the sample.	
A. COMMENCE an RCS cooldown to less than 325°F, within the limits of Figure 1, RCS Pressure Temperature, at a rate NOT to exceed 50°F per hour, using SBCS. REFER TO Figure 2, Recommended Cooldown Guidelines.	**A.** OPERATE **ANY** of the following to cooldown the RCS to less than 325°F, within the limits of Figure 1, RCS Pressure Temperature, at a rate NOT to exceed 50°F per hour. REFER TO Figure 2, Recommended Cooldown Guidelines. • ADVs • 2C AFW Pump
B. RECORD the Pressurizer water phase temperature on Table 1 and PLOT on Figure 4, Pressurizer / RCS Cooldown Curve, every 30 minutes.	
C. PLOT the highest RCS cold leg temperature on Figure 4, Pressurizer / RCS Cooldown Curve, every 30 minutes.	
D. RECORD RCS Boron Concentration every 50°F on Data Sheet 1.	

APPENDIX A
VCT MAKEUP FROM THE SITs
(Page 1 of 2)

INITIAL

If other sources of make up are NOT available, the SITs may be used for makeup to the RCS as follows:

CAUTION

§1 Use only one SIT at a time. RCS pressure must be less than 1750 psia before using this method.

1. Verify NO CIAS or SIAS signal is present. If present, they must be reset for operation of certain valves. _____

2. Ensure V2501, VCT Outlet Valve, is in open and V2504, Refueling Water to Charging Pumps, is in closed. _____ /R36

3. Align the SIT to RWT/VCT line as follows: _____

   A. ¶3 Ensure V2621, VCT Inlet from Pri M/U Wtr. & BAM Isol CLOSED.

   B. Close V3597, SIT Test Line to RWT.

   C. Open and lock V3463, SIT Test Line to RWT.

   D. Open V3201, SIT Recirc. to VCT.

   E. Open SE-03-2A/2B, SIT Test Line to RWT. /R36A

4. Add borated water to the VCT from the selected SIT by opening its associated Fill & Drain Valve as needed. /R36A /R36A /R36A /R36A

   2A1 SIT:SE-03-1A/V3621
   2A2 SIT:SE-03-1B/V3611
   2B1 SIT:SE-03-1C/V3631
   2B2 SIT:SE-03-1D/V3641

5. Borate the RCS to Cold Shutdown boron concentration. _____

APPENDIX A
VCT MAKEUP FROM THE SITs
(Page 2 of 2)

INITIAL

6. ¶3 When the associated SIT reaches its wide range level of 5%, Then ISOLATE by closing its associated fill and drain valve:

   A. 2A1 SIT:SE-03-1A/V3621 _____

   B. 2A2 SIT:SE-03-1B/V3611 _____

   C. 2B1 SIT:SE-03-1C/V3631 _____

   D. 2B2 SIT:SE-03-1D/V3641 _____

END OF APPENDIX A

TABLE 1.2

OPERATIONAL MODES

OPERATIONAL MODE	REACTIVITY CONDITION, K_{eff}	% OF RATED THERMAL POWER*	AVERAGE COOLANT TEMPERATURE
1. POWER OPERATION	$\geq$ 0.99	> 5%	$\geq$ 325°F
2. STARTUP	$\geq$ 0.99	$\leq$ 5%	$\geq$ 325°F
3. HOT STANDBY	< 0.99	0	$\geq$ 325°F
4. HOT SHUTDOWN	< 0.99	0	325°F > T_{avg} > 200°F
5. COLD SHUTDOWN	< 0.99	0	$\leq$ 200°F
6. REFUELING**	$\leq$ 0.95	0	$\leq$ 140°F

* Excluding decay heat.

** Fuel in the reactor vessel with the vessel head closure bolts less than fully tensioned or with the head removed.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	058AG2.2.4	
	Importance Rating		3.6

Loss of DC Power: Ability to explain the variations in control board layout, systems, instrumentation and procedural actions between units at a facility.

Proposed Question: SRO 79

Unit 1 was at 100% power when a loss of the 1A DC bus occurs.

1) The response of the Auxiliary Feedwater Actuation System (AFAS) will be:
2) Which Technical Specification action statement applies to the loss of the A DC bus?

A. 1) Channel A will be in bypass, channel C will be in trip. If SG levels drop to <19% narrow range, full AFAS actuation will occur in 235 seconds.
2) Restore the 1A DC bus to operable status within 2 hours.

B. 1) Channel A will be in bypass, channel C will be in trip. If SG levels drop to <19% narrow range, full AFAS actuation will occur in 210 seconds.
2) Restore the 1A DC bus to operable status within 6 hours.

C. 1) Channel A will be in trip, channel C will be in bypass. If SG levels drop to <19% narrow range, full AFAS actuation will occur in 210 seconds.
2) Restore the 1A DC bus to operable status within 2 hours.

D. 1) Channel A will be in trip, channel C will be in bypass. If SG levels drop to <19% narrow range, full AFAS actuation will occur in 235 seconds.
2) Restore the 1A DC bus to operable status within 6 hours.

Proposed Answer: A

Explanation (Optional):

A. Correct:
B. Incorrect: 210 seconds AFAS time delay is Unit 2 not Unit 1. T.S. action is 2 hours not 6 hours
C. Incorrect: A channel in trip, not bypass. C channel in bypass not trip.
D. Incorrect: A channel in trip, not bypass. C channel in bypass not trip. T.S. action 2 hours not 6 hours

Technical Reference(s): PSL OPS SYS 412 TXT (Attach if not previously provided)
T.S. 3.8.2.3

Proposed references to be provided to applicants during examination: _____

Learning Objective: PSL OPS 0702412 Obj. 14, 19 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 5,6,7 ,10
55.43 2

Comments:

Battery Bus A and Instrument Inverters B and D are powered from Battery Bus B. The internal power supply auctioneering scheme for AFAS is such that the Bistable, Matrices, Initiation, Actuation, and Trip Bypass circuits for each channel should remain energized in the event one safety battery bus is lost. However, power would be lost to the corresponding process instruments (e.g., S/G Level, pressure) resulting in an actuation of AFAS-1 and AFAS-2. The Battery Failure Bypass was built to preclude the unneeded actuation.

Both of the Battery Buses are monitored for voltage and in the event one of them loses power the Battery Failure Bypass is invoked in affected Ch. A or B. The two affected channels will trip, but in Ch. A(B) the battery bus monitoring relay causes the AFAS-1 and AFAS-2 Channel Bypass Relays in the affected Channel A or B to energize, placing that channel in Trip Channel Bypass. This causes the same annunciation and indication as the CHANNEL BYPASS, plus illuminates the BATTERY FAILURE BYPASS indicator on the Ch. A or B Control Panel front and additional annunciators on RTGB-102(202). The additional annunciators are:

UNIT 1	**UNIT 2**
AFAS Bistable Pretrip	AFAS Cabinet Trouble
AFAS Stm Gen Faulted Channel Trip	
AFAS Stm Gen Low Level Channel Trip	
AFAS Trouble/Test	

The end result is one of the two affected channels is bypassed (Ch. A or B), the other is in a tripped condition (Ch. C or D) and the AFAS coincidence logic is reduced to 1 out of 2. If a low level or loss of power subsequently occurs in one of the two operable channels, an AFAS-1(2) would occur.

Based on actual plant operating conditions on loss of a single DC bus, Reactor Protection System will cause the plant to trip. When SG levels drop to <19% on 2/4 channels AFAS-1 and AFAS-2 will actuate after its assigned time delay of 235[210] seconds is met.

On Unit 1, if the "B" DC bus (and thus the AB DC bus) were lost, then AFW Pumps B and C would NOT start. AFW Pump A would feed SG-A. If the "A" DC bus were lost (AB DC bus remained energized), then AFW Pump B would feed SG-B and AFW Pump C would start

electric Pumps would sequence back on. As an alternative, flow can be restored immediately by using the C pump.

Both of these examples are potential scenarios for an AFAS-1(2) d/p lockout to one of the S/Gs. A feedwater header d/p lockout can occur due to one header being pressurized before the other one. This can result from differences in equipment response times (i.e., valve stroke), differences in the sequence of events (i.e., AFAS-1 occurs before AFAS-2), loss of one offsite source vs. both, etc.

OPERATION OF REMOTE-MANUAL INITIATION SWITCHES (RTGB-202)

Each Remote-Manual Initiation Switch at RTGB-202 de-energizes the Initiation, Interposing, Lockout, and both the cycling and latching Actuation Relays for its respective channel without a time delay. Thus, all four switches associated with AFAS-1(2) should be positioned to MANUAL for complete actuation and AFW flow will commence without delay. After the flow control valves have traveled to their full-open position, they can then be throttled to establish manual S/G level control. Since the switches de-energize the Initiation Relays directly (Figure 26), both the Fault/Rupture Identification and the Automatic Level Control features associated with that S/G will be overridden.

AFAS System behavior upon returning the RTGB-202 switches to AUTO will depend upon the status of S/G level and the Initiation Time Delay timer:

1. If 2/4 channels have sensed S/G level below the AFAS trip setpoint (≤ 19.5% NR), the timer has reached the end of the preset delay 235[210] seconds, and level has not been restored (≥29% NR), AFW flow should continue uninterrupted. However, if manual-close operation had been used to move the flow control valves from their full open position, the valves will remain in the manual control mode. Automatic valve cycling operation will not be established until level is restored to the AFAS reset point.

2. If 2/4 channels have sensed S/G level below the AFAS trip setpoint, the timer has not yet reached the end of its preset delay, and level has not been restored, the

ELECTRICAL POWER SYSTEMS

D.C. DISTRIBUTION - OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.3 As a minimum the following D.C. electrical sources shall be OPERABLE:

a. 125-volt D.C. bus No. 1A, 125-volt Battery bank No. 1A and a full capacity charger.

b. 125-volt D.C. bus No. 1B, 125-volt Battery bank No. 1B and a full capacity charger.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With one of the required battery banks or busses inoperable, restore the inoperable battery bank or bus to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one of the required full capacity chargers inoperable, demonstrate the OPERABILITY of its associated battery banks by performing Surveillance Requirement 4.8.2.3.2.a.1 within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.

SURVEILLANCE REQUIREMENTS

4.8.2.3.1 Each D.C. bus train shall be determined OPERABLE and energized at least once per 7 days by verifying indicated power availability.

4.8.2.3.2 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that:

1. The parameters in Table 4.8-2 meet the Category A limits, and

2. The total battery terminal voltage is greater than or equal to 129-volts on float charge.

14,
ltr OPS 0702412 19

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	038EA1.41	
	Importance Rating		3.4

Steam Generator Tube Rupture (SGTR): Venting of the S/G to atmosphere

Proposed Question: SRO 80

Unit 1 has tripped 10 minutes ago, from 100% power with the following:

Time 0220

- 1C Charging pump is out of service
- 1A and 1B Charging pumps are operating
- Letdown has been isolated
- SG Blowdown, SJAE, and Main Steam line Monitors are in alarm
- Pressurizer level is 22% and lowering
- Pressurizer pressure is 1980 psia and lowering
- Tave is 532°F and stable with SBCS in automatic

Time 0240

- A loss of offsite power occurs and both EDG's start and load on their respective buses.

Which ONE of the following identifies the Emergency Classifications for the above times?

A. Unusual Event at Time 0220. Site Area Emergency at Time 0240.

B. Unusual Event at Time 0220. Alert at Time 0240.

C. Alert at Time 0220. Site Area Emergency at Time 0240.

D. Alert at Time 0220. General Emergency at Time 0240.

Proposed Answer: C

Explanation (Optional):

A. Incorrect: Initial classification is Alert due to SGTR >Charging pump capacity. SAE due to loss of SBCS (LOOP) and atmospheric dump valves required to be open.
B. Incorrect: Same as above.
C. Correct. Steam Bypass to condenser will not be available due to loss of non-vital buses. Atmospheric Steam Dump valves will have to be opened to cool down the RCS. This will require escalation to SAE.
D. Incorrect: General Emergency would require loss of 2 of 3 fission barriers with imminent loss of third.

Technical Reference(s): EPIP-01 Classification Of Emergencies. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0702833-03 (As available)

Question Source:
Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content:
55.41 _____
55.43 5

Comments:

Q-80

ATTACHMENT 1
EMERGENCY CLASSIFICATION TABLE
(Page 3 of 21)

EVENT/CLASS	UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
2. ABNORMAL PRIMARY TO SECONDARY LEAK RATE (Page 1 of 2)	**A.** RCS PRI/SEC Leakage • Measured RCS to secondary leakage exceeds Tech. Spec. limits. AND • Secondary plant activity is detected.	**B.1.** Rapid gross failure of one steam generator tube (WITHIN charging pump capacity) with loss of offsite power • Measured RCS to secondary leakage greater than Tech. Spec. Limits and within charging pump capacity. AND • Secondary plant activity is detected. AND • Loss of both Non-Vital 4.16 KV buses. (continued on next page)	**C.1.** Rapid gross failure of steam generator tubes (GREATER THAN charging pump capacity) with a loss of offsite power • Measured RCS to secondary leakage is greater than charging pump capacity. AND • Secondary plant activity is detected. AND • Loss of both Non-Vital 4.16 KV buses. (continued on next page)	**D.** Loss of 2 of the 3 fission product barriers with imminent loss of the third (any two of the following exist and the third is imminent). • Fuel element failure (confirmed DEQ I-131 activity greater than 275 µCi/mL). • LOCA or SGTR. • Containment integrity breached, or Secondary steam release in progress from affected steam generator (i.e., stuck open ADVs, steam safety(s) or an unisolable leak). **NOTE** Also refer to Potential Core Melt Event/Class 14.

2. ABNORMAL PRIMARY TO SECONDARY LEAK RATE

AFTER CLASSIFYING, GO TO EPIP-02, DUTIES AND RESPONSIBILITIES OF THE EMERGENCY COORDINATOR

Q-80

ATTACHMENT 1
EMERGENCY CLASSIFICATION TABLE
(Page 4 of 21)

EVENT/CLASS	UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
2. ABNORMAL PRIMARY TO SECONDARY LEAK RATE (Page 2 of 2)		**B.2.** Rapid failure of steam generator tubes (GREATER THAN charging pump capacity) • Measured RCS to secondary leakage greater than charging pump capacity. AND • Secondary plant activity is detected.	**C.2.** §2 Rapid failure of steam generator tube(s) (GREATER THAN charging pump capacity) with steam release in progress • Measured RCS to secondary leakage greater than charging pump capacity. AND • Secondary plant activity is detected. AND • Secondary steam release in progress from affected steam generator (i.e., stuck open ADVs, steam safety(s) or an unisolable leak.)	

2. ABNORMAL PRIMARY TO SECONDARY LEAK RATE

AFTER CLASSIFYING, GO TO EPIP-02, DUTIES AND RESPONSIBILITIES OF THE EMERGENCY COORDINATOR

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	062AA2.05	
	Importance Rating		2.5

Loss of Nuclear Svc Water: The normal values for SWS-header flow rate and the flow rates to the components cooled by the SWS.

Proposed Question: SRO 80

Unit 2 is at 30% power with the 2A TCW Heat Exchanger out of service. The 2A Heat Exchanger is to be filled and vented using 2-NOP-21.03A '2A Intake Cooling Water System Operation'. The A header is pressurized and the 2A TCW Heat Exchanger will be filled using manual control (throttling open) of MV-21-3, A ICW TRAIN TO TCW HXS.

Which ONE of the following states:

1) The maximum flow through the tubes of the 2A TCW Heat Exchanger?
2) The Operability status of the 2A Intake Cooling Water header?

A. 1) 6250 gpm
   2) 2A ICW header is OPERABLE as long as MV-21-3 can be closed manually if required.

B. 1) 19000 gpm
   2) 2A ICW header is OPERABLE as long as MV-21-3 can be closed manually if required.

C. 1) 6250 gpm
   2) 2A ICW header is NOT OPERABLE until MV-21-3 has been electrically stroked satisfactorily.

D. 1) 19000 gpm
   2) 2A ICW header is NOT OPERABLE until MV-21-3 has been electrically stroked satisfactorily.

Stroke Replaced

Proposed Answer: C

Explanation (Optional):

A. Incorrect: flow rate correct but MV-21-3 must be electrically stroked satisfactorily to be declared back in service.
B. Incorrect: flow rate is for CCW heat exchanger not TCW heat exchanger, MV-21-3 must be electrically stroked satisfactorily to be declared back in service.
C. Correct
D. Incorrect: flow rate is for CCW heat exchanger not TCW heat exchanger

Technical Reference(s): 2-NOP-21.03A 2A Intake Cooling Water System Operation (Attach if not previously provided)

2-0640030 Intake Cooling Water System

2-NOP-14.02 Component Cooling Water System

Proposed references to be provided to applicants during examination: _____

Learning Objective: PSL OPS SYS 313 LPC Obj. B.2 (As available)

Question Source: Bank # _____

Modified Bank # _____ (Note changes or attach parent)

New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 _____

55.43 5

Comments:

Revon 8/14/09

5.2 Filling A Non-Essential ICW Header Using MV-21-3

INITIAL

NOTE

Manual control of MV-21-3, A ICW TRAIN TO TCW HXS will render 2A ICW header out of service until MV-21-3 has been electrically stroked satisfactorily.

1. **ENSURE** A Non-Essential ICW Header down stream of MV-21-3, A ICW TRAIN TO TCW HXS is aligned per 2-NOP-21.12, Intake Cooling Water Initial Valve Alignment. _____

2. **VERIFY** A Essential ICW Header is pressurized. _____

3. **CLOSE** TCV-13-2A, 2A TCW HX OUTLET using manual control (TGB/22/S-20/W-C). _____

4. **CLOSE** TCV-34-3A, 2A OBHX TUBE SIDE OUTLET using manual control (TGB/43/N-21/D). _____

5. **OPEN** breaker 2-41301, Intake Cooling Wtr Hdr. A Non-Emerg. Isol Va. MV-21-3, (RAB 43' A Switch Gear Room 480V MCC 2A6). _____

6. Manually **THROTTLE** OPEN MV-21-3, A ICW TRAIN TO TCW HXS (INTK/11/N-4/W-C). _____

7. **VENT** 2A TCW Heat Exchanger:

   A. **OPEN** SH21171, 2A TCW HX OUTLET HEAD VENT (TGB/26/N-21/E-K). _____

   B. **OPEN** SH21172, 2A TCW HX TUBE SIDE INLET HEAD VENT (TGB/26/N-21/W-D). _____

   C. WHEN a solid stream of water issues from vents, THEN **CLOSE** valves:

   - SH21171, 2A TCW HX OUTLET HEAD VENT _____
   - SH21172, 2A TCW HX TUBE SIDE INLET HEAD VENT _____

8. **VENT** 2A OBHX Heat Exchanger:

   A. **OPEN** SH212012, 2A OBHX INLET HEAD VENT (TGB/45/S-20/E-K). _____

1.0 PURPOSE

INITIAL

This procedure provides instructions for operating the Intake Cooling Water (ICW) System Train A under normal plant operating condition.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Precautions

1. During normal operations, the standby ICW pump RTGB control switch shall be maintained in PULL TO LOCK position.

2. When approaching maximum flows, the heat exchangers should be monitored carefully to detect tube rattle.

2.2 Limitations

1. Flow through a single ICW pump shall not exceed 21,600 gpm. (Section 7.1.3 Management Directive 1)

2. Flow through the tubes of a Component Cooling Water (CCW) Heat Exchanger shall not exceed 19,000 gpm.

3. Flow through the tubes of a Turbine Cooling Water (TCW) Heat Exchangers shall not exceed 6,250 gpm.

4. The ICW Pump discharge valve should be opened approximately 10 turns when starting on a depressurized header.

5. ICW pumps shall not be operated for any extended period of time with the discharge valve near closed.

3.0 PREREQUISITES AND INITIAL CONDITIONS

3.1 Prerequisites

1. **ENSURE** Screen Wash System is available to support ICW Pump operation per 2-NOP-11, Circulating Water System Initial Alignment. _____

2. **ENSURE** Intake Cooling Water is aligned in accordance with 2-NOP-21.12, Intake Cooling Water System Initial Valve Alignment. _____

3.2 Initial Conditions

None

Proposed Answer: A

Explanation (Optional):

A. Correct. MV-18-1 is initially opened. If air leak confirmed, MV-18-1 is closed in 1-101003. Letdown valves close on loss of air which requires Charging pumps to be stopped.
B. Incorrect; All Unit 1 CCW valves to the RCP's are outside of Containment. 2 of 4 CCW valves on Unit 2 are inside containment.
C. Incorrect: MV-18-1 is initially opened.
D. Incorrect: CCW would be lost on Unit 2 but not on Unit 1

Technical Reference(s): 1-1010030 Loss of Instrument Air, Unit 1 T.S. 3.6.1.4 (Attach if not previously provided)
1-ARP-01-F46

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0702860-08, 0902723-02 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 10
55.43 5

Comments:

REVISION:	PROCEDURE TITLE:	PANEL:
1A	ANNUNCIATOR RESPONSE PROCEDURE	F
PROCEDURE NO:		WINDOW:
1-ARP-01-F46	ST. LUCIE UNIT 1	46

ANNUNCIATOR PANEL F

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	**46**	47	48

CNTMT AIR DRYER OUTLET PRESS LOW
F-46

DEVICE:
PIS-18-32 / 599

LOCATION:
RAB/RTGB-102

SETPOINT:
80 psig

ALARM CONFIRMATION:
1. PIS-18-32, Cntmt Instr Air Hdr Press, (RTGB-102) indicates low pressure.

OPERATOR ACTIONS:

NOTE
- Containment Instrument Air Compressor will load at 95 psig and unload at 105 psig.
- Standby Containment Air Compressor will auto start at 90 psig decreasing and will unload at 100 psig.
- PCV-18-5, Backup Instrument Air Supply to Containment, will open at 80 psig decreasing.

1. CHECK PIS-18-32, Containment Instrument Air Header Pressure, (RTGB-102) to determine containment instrument air pressure.
2. DISPATCH an operator to check reflash panels AF-22-1, AF-22-2, and AF-22-3 (RAB 43' elevation near column RA2-RAJ) to determine cause of alarm.
3. If a low air pressure condition exits, Then PERFORM the following:
   A. ENSURE MV-18-1, Instr Air to Cntmt, is OPEN.
   B. If standby Containment Air Compressor is NOT operating, Then PLACE standby Containment Instrument Air Compressor in service in accordance with 1-NOP-18.41, Containment Instrument Air Compressors - Normal Operation.
   C. IMPLEMENT off-normal procedure 1-1010030, Loss of Instrument Air.

CAUSES: Alarm may be caused by failure of 1A (1B) Containment Air Compressor or malfunction of 1A (1B) Containment Air Dryer.

REFERENCES:
1. CWD 8770-B-327, Sheets 599 and 642
2. TEDB

/R1A

/R1

7.2 Subsequent Operator Actions (continued)

INSTRUCTIONS	CONTINGENCY ACTIONS

NOTE

- Indications that there is an instrument air leak inside containment may include the following:
  - PIS-18-32, Containment Instrument Air Header Pressure, indicates significantly lower than PI-18-9, Instrument Air Header Pressure.
  - Instrument air operated components inside containment have positioned to their fail position (Reference Appendix C)
  - Containment Pressure is rising.
- Loss of instrument air to containment will result in the following:
  - Letdown isolates.
  - Pressurizer Spray Valves fail closed. The use of Auxiliary Spray valves will be limited due to loss of letdown flow.
  - RCPs should remain operable since the CCW Supply and Return valves are located outside containment. The RCP Cooling Water Outlet valves fail open. The RCP oil reservoir levels will indicate low.
  - Steam Generator Blowdown flow isolates.
- Technical Specification 3.6.1.4 requires that primary containment internal pressure be maintained between -0.7 and 2.4 psig.

15. If there is an instrument air leak inside containment, Then perform the following:

A. Ensure MV-18-1, Instr Air to Cntmt, is CLOSED.

B. Isolate letdown and charging in accordance with 1-ONP-02.03, Charging and Letdown.

C. Utilize pressurizer heaters and auxiliary spray valves as required to maintain pressurizer pressure.

15.

A. If MV-18-1 is unable to be closed from the control room, Then dispatch an operator to manually close MV-18-1 (Located in the 19.5 Pipe Pen, Pen 9).

APPENDIX C
AIR ACTUATED COMPONENTS
(Page 5 of 6)

11. Instrument Air

COMPONENT	LOC	DESCRIPTION	FAIL POSITION
FCV-23-3	OC	1A S/G Bldn Penetr 6 Isol	Closed
FCV-23-5	OC	1B S/G Bldn Penetr 5 Isol	Closed
FCV-23-7	OC	1A S/G Bldn Sample Isol	Closed
FCV-23-9	OC	1B S/G Bldn Sample Isol	Closed
FCV-23-12	OC	A S/G Bldn Hdr to SGBTF	Closed
FCV-23-14	OC	B S/G Bldn Hdr to SGBTF	Closed
RCV-23-2	OC	Unit 1 S/G Bldn to Bldn Fltrs RAD Cntl	Open
RCV-23-1	OC	Unit 1 S/G Bldn to Disch Canal RAD Cntl	Closed
RCV-31-1	OC	Processed Bldn to Disch Canal RAD Cntl	Closed
FCV-23-4	IC	1A S/G Bldn Penetr 6 Isol	Closed
FCV-23-6	IC	1B S/G Bldn Penetr 5 Isol	Closed
PCV-18-3	ANN	Instr Air to A Main Hatch Door Seal	Open
PCV-18-4	ANN	Instr Air to B Main Hatch Door Seal	Open

12. Heating, Ventilation and Air Condition

COMPONENT	LOC	DESCRIPTION	FAIL POSITION
FCV-25-1	OC	RX Cntmt Purge Isol before Penetr P-11	Closed
FCV-25-6	OC	Inlet of HVE-8A & HVE-8B Casing	Closed
FCV-25-7	ANN	Cntmt VAC Relief	Closed
FCV-25-8	ANN	Cntmt VAC Relief	Closed
FCV-25-3	IC	RX Cntmt Purge Isol after Penetr P-11	Closed
FCV-25-4	IC	RX Cntmt Purge Isol before Penetr P-10	Closed
FCV-25-2	ANN	RX Cntmt Purge Isol Penetr P-11 in Annulus	Closed
FCV-25-5	ANN	RX Cntmt Purge Isol Penetr P-10 in Annulus	Closed

13. Radiation Monitoring

COMPONENT	LOC	DESCRIPTION	FAIL POSITION
FCV-26-2, 4, 6	OC	RCB Atmospheric Sample Isol. Valve	Closed
FCV-26-1, 3, 5	IS	RCB Atmospheric Sample Isol. Valve	Closed

Rev 0L
8/11/93

CONTAINMENT SYSTEMS

INTERNAL PRESSURE

LIMITING CONDITION FOR OPERATION

3.6.1.4 Primary containment internal pressure shall be maintained between –0.7 and 2.4 PSIG.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the containment internal pressure outside of the limits above, restore the internal pressure to within the limits within 1 hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.1.4 The primary containment internal pressure shall be determined to be within the limits at least once per 12 hours.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	037AA2.10	
	Importance Rating		4.1

Ability to determine and interpret the following as they apply to the Steam Generator Tube Leak: Tech-Spec limits for RCS leakage

Proposed Question: SRO 82

Unit 1 is at 100% power with the following Reactor Coolant System Leakage rates.

1A Steam Generator: .05 gpm
1B Steam Generator: .11 gpm

Which ONE of the following states the Technical Specification Reactor Coolant System Leakage that is being exceeded and what is the applicable action statement?

A. TOTAL of 1A and 1B Steam Generator together exceeds the Tech. Spec. limit. Be in at least Hot Standby within 6 hours.

B. ONLY 1B Steam Generator leakage exceeds the Tech. Spec. limit. Be in at least Hot Standby within 6 hours.

C. ONLY 1B Steam Generator leakage exceeds the Tech. Spec. limit. Be in at least Hot Standby within 4 hours.

D. TOTAL of 1A and 1B Steam Generator together exceeds the Tech. Spec. limit. Be in at least Hot Standby within 4 hours.

Proposed Answer: B

Explanation (Optional):

A. Incorrect: 1A SG .05 gpm is 72 gallons per day. 1B is 158 gal per day. Up to 150 gallons per day through ONLY ONE SG is the limit.
B. Correct:: 11 gpm is 158 gallons per day.
C. Incorrect: Hot standby in 6 hours
D. Incorrect: Total not correct, Hot standby in 6 hours

Technical Reference(s): T.S. 3.4.6.2 Reactor Coolant System Leakage (Attach if not previously provided)

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0902723-02 (As available)

Question Source:
Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content:
55.41 _____
55.43 5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	037AA2.10	
	Importance Rating		4.1

Ability to determine and interpret the following as they apply to the Steam Generator Tube Leak: Tech-Spec limits for RCS leakage

Proposed Question: SRO 82

Unit 1 is at 100% power with the following Reactor Coolant System Leakage rates.

1A Steam Generator: .05 gpm
1B Steam Generator: .11 gpm
PORV 1402: 1.2 gpm
Check Valve V3227 0.8 gpm

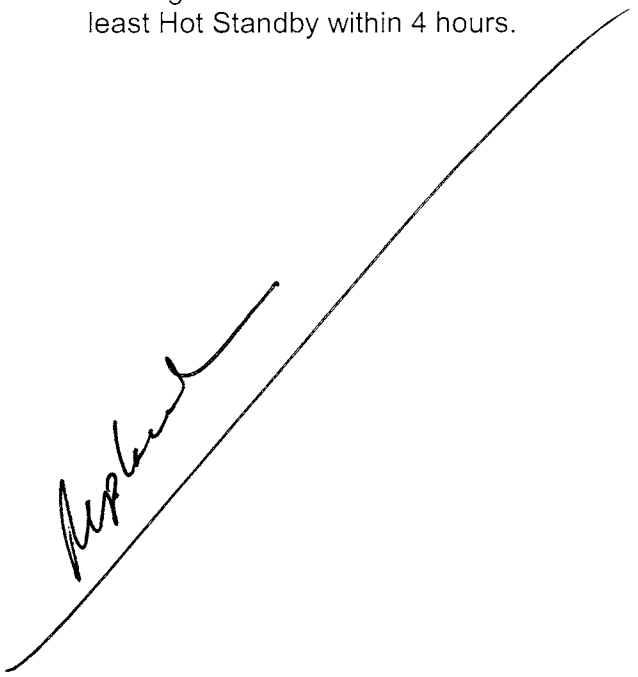
Which ONE of the following states the Technical Specification Reactor Coolant System Leakage that is being exceeded and what is the applicable action statement?

A. TOTAL of 1A and 1B Steam Generator leakage exceeds the Tech. Spec. limit. Be in at least Hot Standby within 6 hours.

B. ONLY 1B Steam Generator leakage exceeds the Tech. Spec. limit. Be in at least Hot Standby within 6 hours.

C. Leakage from Check Valve V3227 exceeds the Tech. Spec. limit. Be in at least Hot Standby within 4 hours.

D. Leakage from the PORV 1402 exceeds the Tech. Spec limit. Be in at least Hot Standby within 4 hours.



Proposed Answer: B

Explanation (Optional):

A. Incorrect: 1A SG .05 gpm is 72 gallons per day. 1B is 158 gal per day. Up to 150 gallons per day through ONLY ONE SG is the limit.
B. Correct:: 11 gpm is 158 gallons per day.
C. Incorrect: V3227 is allowed 1 gpm or 1-5 gpm if previous leakage rates allow.
D. Incorrect: PORV leakage is identified leakage and up to 10 gpm allowed.

Technical Reference(s): T.S. 3.4.6.2 Reactor Coolant System Leakage (Attach if not previously provided)

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0902723-02 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 _____
55.43 5

Comments:

REACTOR COOLANT SYSTEM

REACTOR COOLANT SYSTEM LEAKAGE

LIMITING CONDITION FOR OPERATION

3.4.6.2 Reactor Coolant System operational leakage shall be limited to:

a. No PRESSURE BOUNDARY LEAKAGE,

b. 1 GPM UNIDENTIFIED LEAKAGE,

c. 150 gallons per day primary-to-secondary leakage through any one steam generator (SG),

d. 10 GPM IDENTIFIED LEAKAGE from the Reactor Coolant System, and

e. Leakage as specified in Table 3.4.6-1 for each Reactor Coolant System Pressure Isolation Valve identified in Table 3.4.6-1.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With any PRESSURE BOUNDARY LEAKAGE, or with primary-to-secondary leakage not within limit, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With any Reactor Coolant System operational leakage greater than any one of the above limits, excluding primary-to-secondary leakage, PRESSURE BOUNDARY LEAKAGE, and Reactor Coolant System Pressure Isolation Valve leakage, reduce the leakage rate to within limits within 4 hours or be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.

c. With any Reactor Coolant System Pressure Isolation Valve leakage greater than the limit in 3.4.6.2.e above reactor operation may continue provided that at least two valves, including check valves, in each high pressure line having a non-functional valve are in and remain in the mode corresponding to the isolated condition. Motor operated valves shall be placed in the closed position, and power supplies deenergized. (Note, however, that this may lead to ACTION requirements for systems involved.) Otherwise, reduce the leakage rate to within limits within 4 hours or be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.4.6.2 Reactor Coolant System operational leakages shall be demonstrated to be within each of the above limits by:

a. Monitoring the containment atmosphere gaseous and particulate radioactivity at least once per 12 hours.

TABLE 3.4 6-1

PRIMARY COOLANT SYSTEM PRESSURE ISOLATION VALVES

Check Valve No.
V3227
V3123
V3217
V3113
V3237
V3133
V3247
V3143
V3124
V3114
V3134
V3144

NOTES

(a) Maximum Allowable Leakage (each valve):

1. Leakage rates less than or equal to 1.0 gpm are acceptable.

2. Leakage rates greater than 1.0 gpm but less than or equal to 5.0 gpm are acceptable if the latest measured rate has not exceeded the rate determined by the previous test by an amount the reduces the margin between previous measured leakage rate and the maximum permissible rate of 5.0 gpm by 50% or greater.

3. Leakage rates greater than 1.0 gpm but less than or equal to 5.0 gpm are unacceptable if the latest measured rate exceeded the rate determined by the previous test by an amount that reduces the margin between measured leakage rate and the maximum permissible rate of 5.0 gpm by 50% or greater.

4. Leakage rates greater than 5.0 gpm are unacceptable.

(b) To satisfy ALARA requirements, leakage may be measured indirectly (as from the performance of pressure indicators) if accomplished in accordance with approved procedures and supported by computations showing that the method is capable of demonstrating valve compliance with the leakage criteria.

(c) Minimum test differential pressure shall not be less than 150 psid.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	067AG2.4.21	
	Importance Rating		4.6

Plant Fire on Site: Knowledge of the parameters and logic used to assess the status of safety systems

Proposed Question: SRO 83

Given the following events on Unit 1:

0912: Unit 1 tripped from 100% power and an inadvertent SIAS occurred and has yet to be reset.
0923: A fire alarm was received in the Control Room.
0925: The NPO confirmed a lube oil fire under the HP Turbine.
0927: Both 1A & 1B Fire Pumps are manually started.
0940: The Fire Brigade is fighting the fire but it is NOT under control.
0941: a Loss of Offsite Power (LOOP) occurs.

1) What will be the status of the electric Fire Pumps in support of the fire fighting effort?
2) At what time is the E-Plan EAL required to be declared?

A. 1) Both Fire pumps will AUTOMATICALLY restart following a time delay after EDG breaker closure.
   2) 0935

B. 1) Both Fire pumps will AUTOMATICALLY restart following a time delay after EDG breaker closure.
   2) 0940

C. 1) Both Fire pumps must be MANUALLY restarted following EDG breaker closure.
   2) 0940

D. 1) Both Fire pumps must be MANUALLY restarted following EDG breaker closure.
   2) 0935

Proposed Answer: D

Explanation (Optional):

A. Incorrect: Electric Driven Fire Pumps will trip on the LOOP and require manual restart following EDG breaker closure.
B. Incorrect: Do not automatically start. Time should be 0935
C. Incorrect: EAL should be met at 0935
D. Correct: Electric Driven Fire Pumps will trip on the LOOP and require manual restart following EDG breaker closure. 10 min EAL clock started at time 0925 when fire was confirmed by NPO.

Technical Reference(s): NOP-15.12 Fire Protection System Operation (Attach if not previously provided)

EPIP-01 Classification Of emergencies

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0702311-07, 902702-02 (As available)

Question Source: Bank # _____

Modified Bank # _____ (Note changes or attach parent)

New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7

55.43 5

Comments:

2.4 Drawings

- 8770-G-084, Firewater, Domestic and Makeup Systems (sheets 1, 2 & 3)
- 8770-G-087, Miscellaneous Systems (sheet 2)
- 2998-G-087, Miscellaneous Systems (sheet 2)

2.5 ¶1 CR-01-1501, Restoration of Sprinkler Systems

3.0 PREREQUISITES

INITIAL

3.1 NOP-15.11, Fire Protection System Initial Alignment, is complete. _____ US

3.2 Domestic Water System is in operation in accordance with OI-15-01, Domestic Water System – Normal Operation. _____ US

4.0 PRECAUTIONS / LIMITATIONS

4.1 Both Fire Pumps should be properly aligned and operational at all times.

4.2 §1 Level in the City Water Tanks shall be maintained above 14' 6" at all times.

4.3 Fire Pump operation following a SIAS:

- SIAS – Overrides Fire Pump automatic start. Permissive to manually start.
- LOOP coincident with SIAS – Pump receives a TRIP signal. Permissive to manually start after the associated bus is energized.

5.0 RECORDS REQUIRED

5.1 Completed copy of this procedure shall be maintained in the plant files in accordance with QI-17-PSL-1, Quality Assurance Records.

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5.2 Classifying the Event (continued

1. **A.** **1.** (continued)

Example Scenarios:

(1) 1000 Fire Alarm is received in the Control Room

1005 Fire is confirmed by a NLO in the field

10 minute clock starts

1015 10 minutes have passed since fire was confirmed, the fire is not out and is uncontrolled - EAL is met and an Unusual Event is to be declared - There is no additional 15 minute assessment period.

(2) 1000 All Feedwater is lost

15 minute clock starts

1100 S/G levels lower to below 40% wide range - EAL is met and an Alert is to be declared - There is no additional 15 minute assessment period.

2. Use the best information available when working through the Emergency Classification Table. When confronted with conflicting information for which resolution is not apparent, classify the condition at the highest appropriate emergency class.

3. If, in the judgement of the Shift Manager (SM) /Emergency Coordinator (EC), a situation is more serious than indicated by instrument readings or other parameters, Then classify the emergency condition at the more serious level (i.e., at the highest appropriate emergency class).

4. ¶5 Security Event

If the Control Room is contacted by any of the following: Security, NRC, FBI or NORAD that a terrorist attack on the plant site is imminent or is occurring, Then perform the actions in ONOP-72.01, Response to Security Events and the applicable Security Force Instruction (SFI).

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	074EG2.2.40	
	Importance Rating		4.7

Inad Core Cooling: Ability to apply technical specifications for a system

Proposed Question: SRO 84

The following are the Unit 1 QSPDS indications.

	Incore Thermocouples Operable	Reactor Vessel Level Monitoring Sys. Operable
Channel A	3/core quadrant	4 sensors
Channel B	2/core quadrant	3 sensors

In accordance with Technical Specifications which ONE of the following states the operability of the above systems?

A. Channel A and Channel B for Incore and Reactor Vessel Level are OPERABLE.

B. Channel A for Incore and Reactor Vessel are operable, Channel B for Incore and Reactor level are INOPERABLE.

C. Channel A and B for Incore are OPERABLE, Channel A for Reactor Vessel is OPERABLE, Channel B for Reactor Vessel is INOPERABLE.

D. Channel A for Incore is OPERABLE, Channel B for Incore is INOPERABLE. Channel A and B for Reactor Vessel are both OPERABLE.

Proposed Answer: C

Explanation (Optional):

A. Incorrect, Channel B for Reactor Vessel is INOPERABLE. Must have a minimum of 4 sensors operable.
B. Incorrect
C. Correct, channel B Reactor Vessel level only has 3 sensors operable
D. Incorrect

Technical Reference(s): T.S. Table 3.3-11 Accident Montioring (Attach if not previously provided)
Ops Policy 503 Technical Specification Guidance

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0702407 Obj. 11 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10
55.43 2,5

Comments:

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TABLE 3.3-11

ACCIDENT MONITORING INSTRUMENTATION

	INSTRUMENT	TOTAL NO. OF CHANNELS	MINIMUM CHANNELS OPERABLE	ACTION
1.	Pressurizer Water Level	2	1	1, 6
2.	Auxiliary Feedwater Flow Rate	1/pump	1/pump	7
3.	RCS Subcooling Margin Monitor	2	1	1, 6
4.	PORV Position Indicator Acoustic Flow Monitor	1/valve	1/valve	2
5.	PORV Block Valve Position Indicator	1/valve	1/valve	2
6.	Safety Valve Position Indicator	1/valve	1/valve	3
7.	Incore thermocouples	4/core quadrant	2/core quadrant	1, 6
8.	Containment Sump Water Level (Narrow Range)	1*	1*	4, 5
9.	Containment Sump Water Level (Wide Range)	2	1	4, 5
10.	Reactor Vessel Level Monitoring System	2**	1**	4, 5
11.	Containment Pressure	2	1	1, 6

* The non-safety grade containment sump water level instrument may be substituted.

** Definition of OPERABLE: A channel is composed of eight (8) sensors in a probe, of which four (4) sensors must be OPERABLE.

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TABLE 3.3-11 (continued)

ACTION STATEMENTS

ACTION 1 - With the number of OPERABLE channels less than the Total No. of Channels shown in Table 3.3-11, either restore the inoperable channel(s) to OPERABLE status within 30 days or be in HOT STANDBY within the next 12 hours.

ACTION 2 - With position indication inoperable, restore the inoperable indicator to OPERABLE status or close the associated PORV block valve and remove power from its operator within 48 hours or be in HOT STANDBY within the next 6 hours.

ACTION 3 - With any individual valve position indicator inoperable, obtain quench tank temperature, level and pressure information once per shift to determine valve position.

ACTION 4 - With the number of OPERABLE Channels one less than the Total Number of Channels shown in Table 3.3-11, either restore the inoperable channel to OPERABLE status within 7 days if repairs are feasible without shutting down or prepare and submit a Special Report to the Commission pursuant to the specification 6.9.2 within 30 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

ACTION 5 - With the number of OPERABLE Channels less than the Minimum Channels OPERABLE requirements of Table 3.3-11, either restore the inoperable channel(s) to OPERABLE status within 48 hours if repairs are feasible without shutting down or:

1. Initiate an alternate method of monitoring the reactor vessel inventory; and

2. Prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status; and

3. Restore the Channel to OPERABLE status at the next scheduled refueling.

ACTION 6 - With the number of OPERABLE accident monitoring channels less than the Minimum Channels OPERABLE requirements of Table 3.3-11, either restore the inoperable channel(s) to OPERABLE status within 48 hours or be at least in HOT SHUTDOWN within the next 12 hours.

ACTION 7 - With the number of OPERABLE accident monitoring channels less than the Minimum Channels OPERABLE requirements of Table 3.3-11, either restore the inoperable channel(s) to OPERABLE status within 72 hours or be at least in HOT SHUTDOWN within the next 12 hours.

Operational Guidance for Section 3/4.3
(continued)

3/4.3.3 Monitoring Instrumentation (Unit 1)

1. Table 3.3-6 Item 1 Area Rad Monitors

   The FHB Refueling Canal Area Rad monitor (channel 8) is redundant to the Fuel Storage Pool Area Rad monitor (channel 7) as documented in CR 2006-30899 disposition. Either channel may be used for compliance with the technical specification when one of these Area Radiation Monitors is out of service.

2. Radiation monitors identified in Tech Specs and ODCM that alarm in the Control Room must have alarm capability in order to be declared OPERABLE. If the alarm function does not operate, then the appropriate actions need to be taken in accordance with Tech Specs or ODCM. While the use of the RM-23P may be used on Unit 2 to comply with the alternate method of monitoring, any reports would still be required until the Radiation Monitor is restored to Operable status.

3/4.3.3.8 Accident Monitoring Instrumentation

1. Containment Pressure Transmitter Isolation Valves

   If power is lost to SE-07-5E or SE-07-5F, Containment Pressure Transmitter Isolation Valves, these valves will fail closed. This results in associated pressure transmitter (PT-07-4A1 or PT-07- 4B1) being isolated, and will NOT reflect actual containment pressure. Apply the appropriate requirements of T/S 3.3.3.6, Accident Monitoring Instrumentation. Also refer to Containment Isolation Valves in Section 3.6.3.

   If power is lost to SE-07-5A / B / C / D, Containment Pressure Transmitter Isolation Valves, the associated valve will fail open such that containment pressure input to RPS and ESFAS is assured.

2. Core Exit Thermocouples

   Technical Specification Table 3.3-11 lists the total number of channels as 4/core quadrant with a minimum number of channels of 2/core quadrant.

   A. Total - 4/core quadrant requires at least 2/core quadrant on A QSPDS and 2/core quadrant on B QSPDS to reach a total of 4/core quadrant. This will ensure that upon a loss of one channel of QSPDS the minimum number of CETs would still be available.

   B. Minimum - 2/core quadrant per QSPDS channel (i.e., one operable QSPDS channel with 2 CETs per core quadrant operable).

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	076AA2.04	
	Importance Rating		3.0

High Reactor Coolant Activity: Process effluent radiation chart recorder

Proposed Question: SRO 85

Unit 1 has been at 100% power for 67 days:

RR-2202, Process radiation monitor has indicated a significant increase in selected isotope and Gross activity has not significantly changed.

1) Based on the above indications, what is occurring in the Fuel/RCS?
2) What Technical Specification action is required if selected Isotope exceeds the limit for longer than the allowable time?

A. 1) Fuel Failure
   2) Be in HOT STANDBY with T_{ave} <500°F within 6 hours.

B. 1) Crud Burst
   2) Be in HOT STANDBY with T_{ave} <500°F within 6 hours.

C. 1) Fuel Failure
   2) Be in HOT STANDBY with T_{ave} <515°F within 6 hours.

D. 1) Crud Burst
   2) Be in HOT STANDBY with T_{ave} <515°F within 6 hours.

Proposed Answer: A

Explanation (Optional):

A. Correct: Iodine increase that remains above prior level during steady state
B. Incorrect: Must have gross activity increase during power change
C. Incorrect: T_{ave} <515°F is Technical Specification limit for critically.
D. Incorrect: Both 1 and 2

Technical Reference(s): U1 T.S. 3.4.8 (Attach if not previously provided)
1-ONP-01.06 Excessive RCS Activity

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0702861-08, 0902723-01 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 _____
55.43 5

Comments:

4.4 Letdown Monitor (continued)

INSTRUCTIONS **CONTINGENCY ACTIONS**

NOTE

- Iodine increase that remains significantly above prior levels during steady state operation is indicative of fuel failure.
- Iodine increase concurrent with a Gross Activity increase during a plant load change is indicative of a crud burst.

3. If the affected monitor is functioning properly and indicates high activity, Then GO TO 1-ONP-01.06, Excessive RCS Activity.

END OF SECTION 4.4

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REACTOR COOLANT SYSTEM

SPECIFIC ACTIVITY

LIMITING CONDITION FOR OPERATION

3.4.8 The specific activity of the primary coolant shall be limited to:

a. $\leq$ 1.0 µCi/gram DOSE EQUIVALENT I-131, and

b. $\leq 100/\overline{E}$ µCi/gram.

APPLICABILITY: MODES 1, 2, 3, 4 and 5.

ACTION:

MODES 1, 2 and 3*:

a. With the specific activity of the primary coolant > 1.0 µCi/gram DOSE EQUIVALENT I-131 for more than 100 hours during one continuous time interval or exceeding the limit line shown on Figure 3.4-1, be in HOT STANDBY with T_{avg} < 500°F within 6 hours.

b. With the specific activity of the primary coolant > $100/\overline{E}$ µCi/gram, be in HOT STANDBY with T_{avg} < 500°F within 6 hours.

MODES 1, 2, 3, 4 and 5:

With the specific activity of the primary coolant > 1.0 µCi/gram DOSE EQUIVALENT I-131 or > $100/\overline{E}$ µCi/gram, perform the sampling and analysis requirement of item 4 a) of Table 4.4-4 until the specific activity of the primary coolant is restored to within its limits.

SURVEILLANCE REQUIREMENTS

4.4.8 The specific activity of the primary coolant shall be determined to be within the limits by performance of the sampling and analysis program of Table 4.4-4.

---

* With $T_{avg} \geq$ 500°F.

5. Loss of charging and letdown — **EO-9E**
   a. Inability to makeup to RCS to compensate for:
      1) power change
      2) Temp changes
      3) RCP Bleedoff
6. RCS crud burst — **EO-9F**
   a. Increased activity in RCS
      1) Unit 1 letdown process monitor
         • Increase in gross gamma (channel 40)
      2) Unit 2 RAD monitor isolated
7. Failed fuel element — **EO-9G**
   a. Increased activity in RCS
      1) Unit 1 letdown process monitor
         • Increase in gross gamma (channel 40)
         • Increase in I-131 (channel 41)
      2) Unit 2 Rad monitor isolated
8. Inadvertent Start of a charging pump while the RCS is solid — **EO-9H**
   a. RCS P increase
   b. Potential RCS integrity challenge

V. TECHNICAL SPECIFICATIONS OVERVIEW

A. **Operability of Boron Injection Flowpaths** — **EO-11,**

1. Shutdown must have one boron injection flowpath. — TS 3.1.2.1
2. Operating must have two complete boron injection flowpaths — TS 3.1.2.2

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	003G2.1.32	
	Importance Rating		4.0

Reactor Coolant Pump: Ability to explain all system limits and precautions

Proposed Question: SRO 86

Unit 1 is in Mode 5 performing 1-NOP-01.05 'FILLING AND VENTING THE RCS'. The RCS is solid and the crew is preparing to start the first RCP for venting after a short SNO. The following conditions exist:

- RCS temperature is 140°F.
- RCS pressure is 310 psia.
- Secondary side of the Steam Generator is 145°F.

1) Which of the following states the acceptability of starting the RCP?
2) What are the Technical Specification bases for the criteria to start the RCP?

A. 1) The RCP may NOT be started with the Steam Generator temperature above the RCS temperature.
   2) To prevent RCS overpressurization due to energy addition to the RCS.

B. 1) The RCP may NOT be started with the Steam Generator temperature above the RCS temperature.
   2) To prevent challenging the opening of the PORV's which are NOT designed to relieve a water solid condition.

C. 1) The RCP MAY be started with the current RCS / Steam Generator ΔT.
   2) To prevent RCS overpressurization due to energy addition to the RCS.

D. 1) The RCP MAY be started with the current RCS / Steam Generator ΔT.
   2) To prevent challenging the opening of the PORV's which are NOT designed to relieve a water solid condition.

Proposed Answer: C

Explanation (Optional):

A. Incorrect: RCS / SG ΔT is <30°F which is within T.S. criteria of 30°F.
B. Incorrect: PORV's are set for LTOP and are designed to relieve water solid conditions.
C. Correct:
D. Incorrect: PORV's are set for LTOP and are designed to relieve water solid conditions.

Technical Reference(s): U1 T.S. 3.4.14 (Attach if not previously provided)
U1 T.S. 3/4.4 BASES
1-NOP-01.05 Filling and Venting The RCS

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0902723-01, 0902723-03 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10
55.43 2

Comments:

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4.9 ¶12,13 It is acceptable to fill the RCS from below the 33 foot elevation (63 inches on LI-1117-1) to above the 33 foot elevation with seal injection isolated to an RCP (coupled or uncoupled), without pump seal degradation.

4.10 ¶7 Continued use of seal injection when filling above the level of Seal Cartridge is not required.

4.11 When RCS temperature is greater than 200°F, both charging header loop isolation valves should remain open when seal injection is aligned to the RCPs to minimize thermal stress on the RCP shafts.

4.12 §1 When the RCS cold leg temperature is less than 304°F, the Reactor Head is on the Reactor Vessel AND the RCS is NOT vented through a hole greater than 1.75 square inches, Then two PORVs shall be operable, in service and selected to LOW RANGE OPERATION.

4.13 When the RCS is in Solid Pressure Control, Then close scrutiny should be given to any action that could result in the de-energization of any portion of the Class 1E 125V DC System. This could cause both the isolation of the RCS while solid and the simultaneous failure of one PORV thereby challenging the LTOP single failure design criteria.

4.14 §1 An RCP shall NOT be started in an idle RCS loop unless the Steam Generator secondary temperature is less than 30 F above each of the RCS cold leg temperatures (T.S. 3.4.14).

4.15 ¶3 Routine operation of the RCGVS has resulted in degradation of the solenoid actuated valves in the system. RCS venting from the Reactor Vessel and the Pressurizer shall be accomplished through manually operated valves and attached hoses.

4.16 Do NOT operate the Control Element Drive Mechanisms (CEDMs) unless RCS pressure is at least 100 psia above the pressure that the RCS was vented. If CEDM operation is required less than 100 psia above the RCS venting pressure, Then VENT the CEDMs in accordance with Appendix A (8770-15818, Replacement Jack Type Control Element Drive Mechanism).

4.17 Appendix D, RCGVS Vent Path Debris Removal / Flush, may be performed at any time as management directs and does not require all Related System Status items to be completed.

4.18 When the RCS was not drained to the point where the S/G U-tubes were drained, RCP sweeps may be limited based on the observed air quantity during system vent and management concurrence.

4.19 This procedure may contain steps that could adversely affect reactivity. ENSURE that proper consideration and appropriate briefings occur prior to performance of steps that could challenge reactivity.

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3/4.4 REACTOR COOLANT SYSTEM (continued)

BASES (continued)

3/4.4.11 DELETED

3/4.4.12 PORV BLOCK VALVES

The opening of the Power Operating Relief Valves fulfills no safety related function. The electronic controls of the PORVs must be maintained OPERABLE to ensure satisfaction of Specifications 3.4.12 and 3.4.13. Since it is impractical and undesirable to actually open the PORVs to demonstrate reclosing, it becomes necessary to verify operability of the PORV Block Valves to ensure the capability to isolate a malfunctioning PORV.

3/4.4.13 POWER OPERATED RELIEF VALVES and
3/4.4.14 REACTOR COOLANT PUMP - STARTING

The low temperature overpressure protection system (LTOP) is designed to prevent RCS overpressurization above the 10 CFR 50 Appendix G operating limit curves (Figures 3.4-2a and 3.4-2b) at RCS temperatures at or below 304°F during heatup and 281°F during cooldown. The LTOP system is based on the use of the pressurizer power-operated relief valves (PORVs) and the implementation of administrative and operational controls.

The PORVs aligned to the RCS with the low pressure setpoints of 350 and 530 psia, restrictions on RCP starts, limitations on heatup and cooldown rates, and disabling of non-essential components provide assurance that Appendix G P/T limits will not be exceeded during normal operation or design basis overpressurization events due to mass or energy addition to the RCS. The LTOP system APPLICABILITY, ACTIONS, and SURVEILLANCE REQUIREMENTS are consistent with the resolution of Generic Issue 94, "Additional Low-Temperature Overpressure Protection for Light-Water Reactors," pursuant to Generic Letter 90-06.

REACTOR COOLANT SYSTEM

REACTOR COOLANT PUMP - STARTING

LIMITING CONDITION FOR OPERATION

3.4.14 If the steam generator temperature exceeds the primary temperature by more than 30°F, the first idle reactor coolant pump shall not be started.

APPLICABILITY: MODES 4# and 5.

ACTION:

If a reactor coolant pump is started when the steam generator temperature exceeds primary temperature by more than 30°F, evaluate the subsequent transient to determine compliance with Specification 3.4.9.1.

SURVEILLANCE REQUIREMENTS

4.4.14 Prior to starting a reactor coolant pump, verify that the steam generator temperature does not exceed primary temperature by more than 30°F.

Reactor Coolant System Cold Leg Temperature is less than 304°F.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	010A2.01	
	Importance Rating		3.6

Pressurizer Pressure Control: Heater failures

Proposed Question: SRO 87

Unit 2 was operating at 100% power. Given the following events and conditions on 8/20 at 0200:

- DCS is temporarily out of service.
- Proportional heater bank P1 breaker failed.
- Surveillance 2-OSP-100.02 (*Schedule of Periodic Tests, Checks and Calibrations Week 2*) step 7.4 (Thursday) was conducted.
- The following results were obtained for Pressurizer backup heaters:
  - 1E bus voltage = 480 volts
  - B1 = 182 amps
  - B4 = 192 amps

Given:

- Heater KW calculation: $\sqrt{3}$ x amps x volts /1000
- The DCS and backup manual calculates heater KW from the 4.16KV side. Losses of approximately 5 KW will occur in Pressurizer heater step down transformers.

Which ONE of the following statements correctly describes the required maintenance actions to allow continued operation at 100%?

A. Power operations may continue with NO restrictions. Schedule maintenance to repair the proportional heater breaker during the next scheduled maintenance period.

B. Schedule maintenance to repair and have the proportional heater group made operable NO later than 8/23 at 0200.

C. Schedule maintenance to repair and have the backup heater group B1 made operable NO later than 8/23 at 0200.

D. Schedule maintenance to repair and have the backup heater group B1 made operable NO later than 8/20 at 0800.

Proposed Answer: C

Explanation (Optional):
B1=1.73*480*182/1000=151.3KW<155KW – fails
B1=1.73*480*192/1000=159.3KW>155KW – pass
Total for bank B1 = 151.3 KW<155KKW = does not meet surveillance requirement

T.S. 3.4.3 requires 2 B/U heater banks B1 and B4 >150KW heating capacity

A. Incorrect: with B1 <155KW, the plant is in a 72 hour LCO per action a.
B. Incorrect: Repairing the proportional heater bank does not restore pressurizer heater capacity per T.S. 3.4.3
C. Correct
D. Incorrect: 72 hour to restore the heater banks.

Technical Reference(s): 2-OSP-100.02 *Schedule of Periodic Tests, Checks and Calibrations Week 2* (Attach if not previously provided)
T.S. 3.4.3

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0702206-05, 0702206-15 (As available)

Question Source: Bank # X (2004 NRC Exam) See Comment
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 5
55.43 5

Comments: References: 2004 NRC exam gave references, including Tech. Specs. to determine operability. Revised this question by including the two bullets under 'Given' and not handing out references.

7.4 Surveillances performed on Thursday (continued) INITIAL

2. ¶4 Day shift surveillances are to be performed as follows:

NOTE

- 2A3 and 2B3 bus voltage should be at approximately 4.16 KV for performance of the following surveillance. Consideration should be given to adjusting switchyard voltage as necessary to obtain nominal bus voltage.
- ¶5 The pressurizer heater kW can be calculated and used as a second - check verification of the DCS indicated pressurizer heater kW for the Tech Spec surveillance. The calculation is:

  $\sqrt{3}$ x amps x volts ÷ 1000
- ¶7 The DCS and backup manual method calculates heater KW from the 4.16 KV side. Losses of approximately 5 KW will occur in pressurizer heater step down transformers.

A. §1 VERIFY Pressurizer Backup heaters 1 and 4 each have a nominal capacity of at least 150 kw.

1. ¶7 With only the backup heater bank 1 in service (de-energize "A" side proportional heater P-1) on the "A" side, VERIFY nominal capacity of at least 155 kw (150 kw tech spec + 5 kw xmfer losses) as indicated by DCS point W943A Presszer Heater Pwr A.

_____ kw _____ switchyard voltage _____

OR

¶5,7 With only the backup heater bank 1 in service on the "A" side, VERIFY nominal capacity of at least 155 kW (150 KW tech spec + 5 KW xmfer losses) as indicated by AM 943 on plant auxiliary control board no. 2 VM 954 on RTGB201.

$\sqrt{3}$ x _____ (AM 943) amps x _____ (VM 954) volts = _____ watts

_____ watts ÷ 1000 = _____ kW _____

7.4 Surveillances performed on Thursday (continued) INITIAL

2. A. (continued)

2. ¶7 With only the backup heater bank 4 in service (de-energize "B" side proportional heater P-2) on the "B" side, VERIFY nominal capacity of at least 155 kw (150 kw tech spec + 5 kw xmfer losses) as indicated by DCS point W944B Presszer Heater Pwr B.

_____ kw _____ switchyard voltage _____

OR

¶5,7 With only the backup heater bank 4 in service on the "B" side, VERIFY nominal capacity of at least 155 kW (150 KW tech spec + 5 KW xmfer losses) as indicated by AM 944 on plant auxiliary control board no. 2 VM964 on RTGB 201.

$\sqrt{3}$ x _____ amps (AM 944) x _____ volts (VM 964) = _____ watts

_____ watts ÷ 1000 = _____ kW_____ _____

Tech. Spec.: 4.4.3.2

Record ID 929

Applicable Modes: 1, 2 and 3

B. §1 PERFORM 2C AFW Pump Monthly Operability per 2-OSP-09.01C, 2C Auxiliary Feedwater Pump Code Run, Testing of the 2C Auxiliary Feedwater Pump for Operability. _____

Applicable Modes: 1,2 and 3

C. ALIGN the Fuel Pool Purification System to the Spent Fuel Pool, in accordance with OP 2-0350020, Fuel Pool Cooling and Purification System - Normal Operation. _____ SNPO

Application Modes: All

Rev 01C
8/14/05

REACTOR COOLANT SYSTEM

3/4.4.3 PRESSURIZER

LIMITING CONDITION FOR OPERATION

3.4.3 The pressurizer shall be OPERABLE with a minimum water level of greater than or equal to 27% indicated level and a maximum water level of less than or equal to 68% indicated level and at least two groups of pressurizer heaters capable of being powered from 1E buses each having a nominal capacity of at least 150 kW.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

a. With one group of the above required pressurizer heaters inoperable, restore at least two groups to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. With the pressurizer otherwise inoperable, be in at least HOT STANDBY with the reactor trip breakers open within 6 hours and in HOT SHUTDOWN within the following 6 hours.

SURVEILLANCE REQUIREMENTS

4.4.3.1 The pressurizer water volume shall be determined to be within its limits at least once per 12 hours.

4.4.3.2 The capacity of each of the above required groups of pressurizer heaters shall be verified to be at least 150 kW at least once per 92 days.

4.4.3.3 The emergency power supply for the pressurizer heaters shall be demonstrated OPERABLE at least once per 18 months by verifying that on an Engineered Safety Features Actuation test signal concurrent with a loss of offsite power:

a. the pressurizer heaters are automatically shed from the emergency power sources, and

b. the pressurizer heaters can be reconnected to their respective buses manually from the control room after resetting of the ESFAS test signal.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	012G2.4.31	
	Importance Rating		4.1

Reactor Protection: Knowledge of annunciators alarms, indications or response procedures.

Proposed Question: SRO 88

Unit 2 is at 2% power and performing a Reactor startup when the following alarm illuminates:

START - UP RATE HIGH CHANNEL TRIP L-25

Reactor power remains unchanged.

1) Which ONE of the following would have caused the annunciator to illuminate?
2) As a result of the above condition, what are the required Technical Specification actions?

A. 1) Wide Range Nuclear Instrument failing HIGH
   2) Bypass or trip the failed channel within one hour. Start up may continue however the channel must be restored to operable status or placed in the tripped condition.

B. 1) Wide Range Nuclear Instrument failing HIGH
   2) Bypass or trip the failed channel within one hour. Start up may continue with the channel in bypass however the channel shall be returned to operable status no later than during the next cold shutdown.

C. 1) Linear Range Nuclear Instrument failing HIGH
   2) Bypass or trip the failed channel within one hour. Start up may continue however the channel must be restored to operable status or placed in the tripped condition.

D. 1) Linear Range Nuclear Instrument failing HIGH
   2) Bypass or trip the failed channel within one hour. Start up may continue with the channel in bypass however the channel shall be returned to operable status no later than during the next cold shutdown.

Proposed Answer: B

Explanation (Optional):

A. Incorrect: Not required to be placed in the tripped condition. This is a Unit 1 Tech Spec.
B. Correct
C. Incorrect: Both parts incorrect
D. Incorrect: Part 1 incorrect, Part 2 correct.

Technical Reference(s): T.S. table 3.3-1 (Attach if not previously provided)
2-ARP-01-L25 Annunciator Response Procedure

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0702403-03, 0702403-14 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 10
55.43 5

Comments:

Rev 0B 8/19/05

REVISION:	PROCEDURE TITLE:	PANEL:
0B	ANNUNCIATOR RESPONSE PROCEDURE	L
PROCEDURE NO:		WINDOW:
2-ARP-01-L25	ST. LUCIE UNIT 2	25

ANNUNCIATOR PANEL L

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48

START-UP RATE HIGH CHANNEL TRIP
L-25

DEVICE:
Module W9P2 K4 relay

LOCATION:
RPS Cabinets

SETPOINT:
≤ 2.49 Decades per minute

ALARM CONFIRMATION:
1. Any HI RATE Trip Unit trip light LIT
2. JKI-001A to JKI-001D, Startup Rate, indicate greater than 2.49 DPM startup rate.
3. JI-001A to JI-001D, Wide Range % Power, indicate a rapidly RISING Reactor power.
4. RI-26-80A4/80A5 and RI-26-80B4/80B5, Source/Wide range Excore Neutron Monitors indicate a rapidly RISING Reactor power.
5. RI-26-80A3 and RI-26-80B3, Rate Of Change Excore Neutron Monitors, indicate greater than 2.49 DPM startup rate.

OPERATOR ACTIONS:

NOTE
- This Trip function is enabled between 10^{-4}% to 15% reactor power.
- The Wide Range Nuclear Instruments enable this trip function,
- The Linear Range Instruments disable this trip function

1. If 2 out of 4 Safety channels on Startup Rate are greater than 2.49 DPM, Then PERFORM the following:
   A. TRIP the Reactor
   B. TRIP the Turbine
   C. GO TO 2-EOP-01, Standard Post Trip Actions.
2. MONITOR for disagreement between the four Wide Range Nuclear Instruments.
3. If only one channel is tripped or failed, Then IMPLEMENT 2-ONP-99.01, Loss of Tech Spec Instrumentation.

CAUSES: The Reactor tripped on 2/4 logic from High Rate of Power Change or a Wide Range Nuclear Instrument Failed.

REFERENCES:
1. CWD 2998-B-327 SH 406, 50, 51
2. VTM 2998-14944
3. Tech Specs.

/R0B /R0A

TABLE 3.3-1

REACTOR PROTECTIVE INSTRUMENTATION

	FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1.	Manual Reactor Trip	4 4	2 2	4 4	1, 2 3*, 4*, 5*	1 5
2.	Variable Power Level – High	4	2(a)(d)	3	1, 2	2#
3.	Pressurizer Pressure – High	4	2	3	1, 2	2#
4.	Thermal Margin/Low Pressure	4	2(a)(d)	3	1, 2	2#
5.	Containment Pressure – High	4	2	3	1, 2	2#
6.	Steam Generator Pressure – Low	4/SG	2/SG(b)	3/SG	1, 2	2#
7.	Steam Generator Pressure Difference – High	4	2(a)(d)	3	1, 2	2#
8.	Steam Generator Level – Low	4/SG	2/SG	3/SG	1, 2	2#
9.	Local Power Density – High	4	2(c)(d)	3	1	2#
10.	Loss of Component Cooling Water to Reactor Coolant Pumps	4	2	3	1, 2	2#
11.	Reactor Protection System Logic	4	2	3	1, 2 3*, 4*, 5*	2# 5
12.	Reactor Trip Breakers	4	2(f)	4	1, 2 3*, 4*, 5*	4 5
13.	Wide Range Logarithmic Neutron Flux Monitor					
	a. Startup and Operating – Rate of Change of Power – High	4	2(e)(g)	3	1, 2	2#
	b. Shutdown	4	0	2	3, 4, 5	3
14.	Reactor Coolant Flow – Low	4/SG	2/SG(a)(d)	3/SG	1, 2	2#
15.	Loss of Load (Turbine Hydraulic Fluid Pressure – Low)	4	2(c)	3	1	2#

Rev 0/1 Errata

TABLE 3.3-1 (Continued)

ACTION STATEMENTS

ACTION 2 - a. With the number of channels OPERABLE one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may continue provided the inoperable channel is placed in the bypassed or tripped condition within 1 hour. The channel shall be returned to OPERABLE status no later than during the next COLD SHUTDOWN.

b. With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, STARTUP and/or POWER OPERATION may continue provided the following conditions are satisfied:

1. Verify that one of the inoperable channels has been bypassed and place the other inoperable channel in the tripped condition within 1 hour.

2. All functional units affected by the bypassed/tripped channel shall also be placed in the bypassed/tripped condition.

With a channel process measurement circuit that affects multiple functional units inoperable or in test, bypass or trip all associated functional units as listed below:

Process Measurement Circuit	Functional Unit Bypassed
1. Safety Channel – Nuclear Instrumentation	
Wide Range	Rate of Change of Power – High (RPS)
Linear Range	Variable Power Level – High (RPS) Local Power Density – High (RPS) Thermal Margin/Low Pressure (RPS)
2. Pressurizer Pressure -	Pressurizer Pressure – High (RPS) Thermal Margin/Low Pressure (RPS) Pressurizer Pressure – Low (ESF)
3. Containment Pressure -	Containment Pressure – High (RPS) Containment Pressure – High (ESF)
4. Steam Generator Pressure -	Steam Generator Pressure – Low (RPS) Thermal Margin/Low Pressure (RPS) AFAS-1 and AFAS-2 (AFAS) Steam Generator Pressure – Low (ESF)
5. Steam Generator Level -	Steam Generator Level – Low (RPS) If SG-2A, then AFAS-1 (AFAS) If SG-2B, then AFAS-2 (AFAS)

TABLE 3.3-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
11. Wide Range Logarithmic Neutron Flux Monitor					
a. Startup and Operating -- Rate of Change of Power – High	4	2(d)	3	1, 2 and *	2#
b. Shutdown	4	0	2	3, 4, 5	3
12. Reactor Protection System Logic	4	2	4	1, 2*	4
13. Reactor Trip Breakers	4	2	4	1, 2*	4

TABLE 3.3-1 (Continued)

TABLE NOTATION

* With the protective system trip breakers in the closed position and the CEA drive system capable of CEA withdrawal.

The provisions of Specification 3.0.4 are not applicable.

(a) Trip may be bypassed below 1% of RATED THERMAL POWER; bypass shall be automatically removed when Wide Range Logarithmic Neutron Flux power is $\geq$ 1% of RATED THERMAL POWER.

(b) Trip may be manually bypassed below 685 psig; bypass shall be automatically removed at or above 685 psig.

(c) Trip may be bypassed below 15% of RATED THERMAL POWER; bypass shall be automatically removed when Power Range Neutron Flux power is $\geq$ 15% of RATED THERMAL POWER.

(d) Trip may be bypassed below 10^{-4}% and above 15% of RATED THERMAL POWER; bypass shall be automatically removed when Wide Range Logarithmic Neutron Flux power is $\geq 10^{-4}$% and Power Range Neutron Flux power $\leq$ 15% of RATED THERMAL POWER.

(e) Deleted.

(f) There shall be at least two decades of overlap between the Wide Range Logarithmic Neutron Flux Monitoring Channels and the Power Range Neutron Flux Monitoring Channels.

ACTION STATEMENTS

ACTION 1 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours and/or open the protective system trip breakers.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. For the purposes of testing and maintenance, the inoperable channel may be bypassed for up to 48 hours from time of initial loss of OPERABILITY; however, the inoperable channel shall then be either restored to OPERABLE status or placed in the tripped condition.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	063A2.01	
	Importance Rating		3.2

DC Electrical Distribution: Ability to predict the impacts of the following malfunctions or operations on the DC electrical systems: based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Grounds

Proposed Question: SRO 89

Unit 1 has received the following alarms:

125V DC BUS 1B GROUND A-10	125V DC BUS 1AB GROUND A-40

The 1AB DC Bus is cross-tied to the 1B DC Bus.

1) Which of the following procedures will be implemented FIRST in an attempt to determine the ground location?
2) When the 125V DC Bus 1B and 1AB bus are separated, what Technical Specification equipment could be affected?

A. 1) 1-ONP-50.01 125V DC GROUND DIAGNOSTIC
   2) 1B / 1BB Battery Charger

B. 1) 1-ONP-50.01 125V DC GROUND DIAGNOSTIC
   2) AFW PP 1C

C. 1) 1-ONP-50.04 125V DC BUS 1AB GROUND ISOLATION
   2) 1B / 1BB Battery Charger

D. 1) 1-ONP-50.04 125V DC BUS 1AB GROUND ISOLATION
   2) AFW PP 1C

Proposed Answer: B

Explanation (Optional):

A. Incorrect: part one is correct, part two is incorrect. The 1B/1BB battery charger is not removed form service in this procedure.
B. Correct. Ground diagnostics procedure is implemented first to determine where the ground is located. Ground diagnostic procedure CAUTION states 1AB loads will be inoperable when removing 1AB DC bus.
C. Incorrect: both part one and part two are not correct. Part one going to 1-ONP-50.04 is plausible because it will be entered after a ground is determined by 1-ONP-50.01 APPENDIX-B.
D. Incorrect: part one is not correct, part two is correct.

Technical Reference(s): 1-ONP-50.01 125V DC Ground Diagnostic (Attach if not previously provided)

1-ARP-01-A40 & A10 125V DC Bus/Batt CHGR 1AB Ground

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0702863-08, 0902723-02 (As available)

Question Source: Bank # _____

Modified Bank # _____ (Note changes or attach parent)

New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 5

55.43 5

Comments:

6.0 OPERATOR ACTIONS (continued)

	INSTRUCTIONS		CONTINGENCY ACTIONS
6.	VERIFY annunciator A-40, 125V DC Bus 1AB Ground, is CLEAR.	**6.**	If annunciator A-40 is ALARMED, and 125V DC Buses 1A and 1AB are cross-tied, Then PERFORM Appendix A, Determination of 125V DC Buses 1A and 1AB Ground Location. If annunciator A-40 is ALARMED, and 125V DC Buses 1B and 1AB are cross-tied, Then PERFORM Appendix B, Determination of 125V DC Buses 1B and 1AB Ground Location. **If 125V DC Bus 1AB is NOT cross-tied to 125V DC Buses 1A or 1B, Then GO TO 1-ONP-50.04, 125V DC Bus 1AB Ground Isolation.**
7.	VERIFY annunciator B-10, 125V DC Bus 1A Ground, is CLEAR.	**7.**	**If annunciator B-10 is ALARMED Then GO TO 1-ONP-50.02, 125V DC Bus 1A Ground Isolation.**
8.	VERIFY annunciator A-10, 125V DC Bus 1B Ground, is CLEAR.	**8.**	**If annunciator A-10 is ALARMED, Then GO TO 1-ONP-50.03, 125V DC Bus 1B Ground Isolation.**

END OF SECTION 6.0

APPENDIX B
DETERMINATION OF 125V DC BUSES 1B AND 1AB GROUND LOCATION
(Page 1 of 3)

INITIAL

1. ENSURE 1AB Battery Charger is in hot standby, in accordance with 1-NOP-50.01AB, 125V DC Bus 1AB (Class 1E) Normal Operation. _____ US

CAUTION
Separating 125V DC Bus 1B and 1AB will render Bus 1AB loads inoperable, since no battery is connected to the bus.

2. REFER TO the following Tech Spec sections for LCO and Action requirements:

- Charging Pump 1C, Sections 3.1.2.1, 3.1.2.2, 3.1.2.3 and 3.1.2.4 _____
- AFW PP 1C, Section 3.7.1.2 _____
- CCW PP 1C , Section 3.7.3.1 _____
- ICW PP 1C, Section 3.7.4.1 _____

Separating 125V DC Bus 1B and 1AB is authorized. _____ US

3. If separating 125V DC Bus 1B and 1AB is NOT authorized, Then PERFORM **BOTH** of the following:

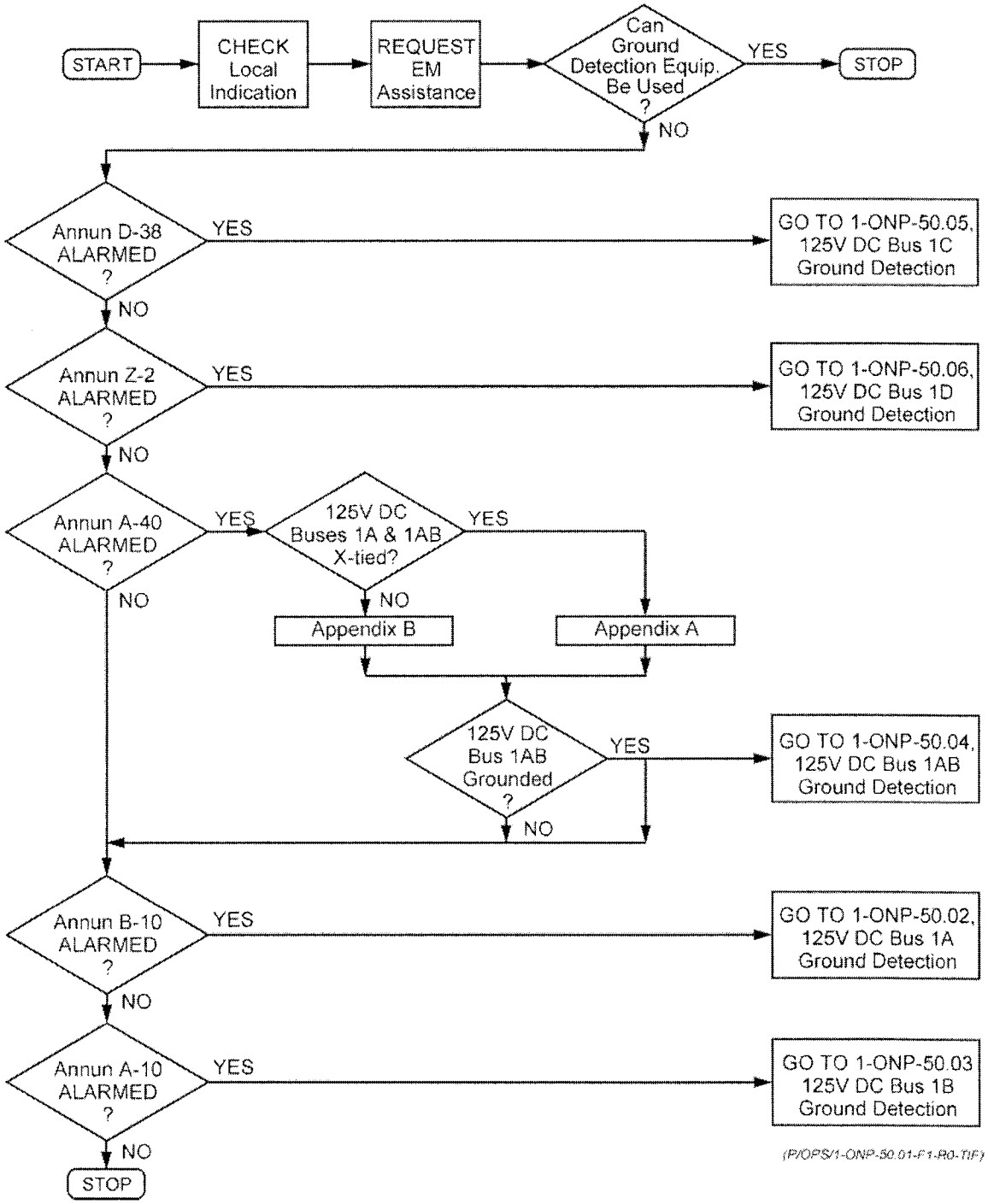
- **GO TO 1-ONP-50.03, 125V DC Bus 1B Ground Isolation.** _____
- **GO TO 1-ONP-50.04, 125V DC Bus 1AB Ground Isolation.** _____

4. VERIFY at least **ONE** of the following:

A. Battery Charger 1B is operable. _____ US

B. Battery Charger 1BB is operable. _____ US

FIGURE 1
DIAGNOSTIC FLOW CHART
(Page 1 of 1)



REVISION NO:	PROCEDURE TITLE:	PANEL:
0A	ANNUNCIATOR RESPONSE PROCEDURE	A
PROCEDURE NO:	ST. LUCIE UNIT 1	WINDOW:
1-ARP-01-A10		10

/R0A

ANNUNCIATOR PANEL A

1	2	3	4	5	6	7	8	9	**10**
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

125V DC
BUS 1B
GROUND

A-10

DEVICE:
64P/1002, 64N/1002
30-1/1527

LOCATION:
1B 125V DC Bus
RAB/RTGB-101

SETPOINT:
DC System Ground
64P/64N Energized

ALARM CONFIRMATION:

1. **ANY/ALL** of the following:
   A. DISPATCH an operator to the 1B 125V DC Bus to verify the ground and to determine which pole of the DC Bus is grounded as follows:
      1. MOVE the ground test toggle switch to the upward position and observe the brilliance of the positive and negative test lights.
      2. The DIMMER of the two lights is the side that has the ground with the difference in brilliance indicating the severity of the ground.

OPERATOR ACTIONS:

1. Corrective Actions:
   A. RECALL any DC equipment starts that occurred at or near the same time the ground annunciated and CONSIDER these loads as possible causes of the ground.
   B. GO TO ONOP 1-ONP-50.01, 125V DC Ground Diagnostic.

CAUSES: DC bus, cable, or equipment degradation has resulted in DC current leakage to ground.

REFERENCES: 1) CWD 8770-B-327 sheet 1527, 1002

REVISION NO: 0B	PROCEDURE TITLE: ANNUNCIATOR RESPONSE PROCEDURE	PANEL: A
PROCEDURE NO: 1-ARP-01-A40	ST. LUCIE UNIT 1	WINDOW: 40

ANNUNCIATOR PANEL A

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	**40**
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

125V DC BUS 1AB GROUND

A-40

DEVICE:
64P, 64N/1003
30-2/1524

LOCATION:
1AB 125V DC Bus
RAB/RTGB-101

SETPOINT:
1 AB DC System Ground
64P/64N Energized

ALARM CONFIRMATION:

1. **ANY/ALL** of the following:
   A. DISPATCH an operator to the 1AB 125V DC Bus to verify the ground and DETERMINE which pole of the DC bus is grounded as follows:
      1. MOVE the ground test toggle switch to the upward position and OBSERVE the brilliance of the positive and negative test lights.
      2. The DIMMER of the two lights is the side that has the ground with the difference in brilliance indicating the severity of the ground.

OPERATOR ACTIONS:

1. Corrective Actions:
   A. RECALL any DC equipment starts that occurred at or near the same time the ground annunciated and CONSIDER these loads possible causes of the ground.
   B. GO TO 1-ONP-50.01, 125V DC Ground Diagnostic.

CAUSES: DC bus, cable, or equipment degradation has resulted in DC current leakage to ground.

REFERENCES: 1) CWD 8770-B-327 sheet 1524, 1003
2) 1-EMP-50.02, 125V DC System Battery Charging 18 Month Maintenance

/R0B

/R0A

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	076A2.01	
	Importance Rating		3.7

Service Water: Ability to predict the impacts of the following malfunctions or operations on the SWS; and based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of SWS

Proposed Question: SRO 90

Given the following conditions:

- Unit 2 is at 100% power.
- 2A and 2B Intake Cooling Water pumps are operating on their respective headers.
- 2C Intake Cooling Water pump is in standby aligned to the A header.
- The 2B Intake Cooling Water pump trips unexpectedly.

1) Which ONE of the following states the acceptability of an immediate attempt to restart the 2B Intake Cooling water pump?

2) If the 2C Intake Cooling Water pump valve alignment was configured to the B side but the electrical alignment remained to the A side, what would be the required actions if the pump started?

A. 1) One restart attempt IS allowed for the stated conditions.
2) The respective offsite power source AND the 2B Intake Cooling train must be declared out of service.

B. 1) One restart attempt IS NOT allowed for the stated conditions.
2) ONLY the 2B Intake Cooling train must be declared out of service.

C. 1) One restart attempt IS allowed for the stated conditions.
2) ONLY the 2B Intake Cooling train must be declared out of service.

D. 1) One restart attempt IS NOT allowed for the stated conditions.
2) The respective offsite power source AND the 2B Intake Cooling train must be declared out of service.

Proposed Answer: B

Explanation (Optional):

A. Incorrect: Restart ONLY allowed if health and safety of the public is in jeopardy. Offsite power is not required to be declared out of service on Unit 2, only Unit 1.
B. Correct
C. Incorrect: Restart NOT allowed
D. Incorrect: Offsite power not required to be declared out of service.

Technical Reference(s): 2-0640030 Intake Cooling Water System, U2 T.S. 3.7.4, OPS -503 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0702862-08, 0902723-01 (As available)

Question Source: Bank # _____
Modified Bank # 2008 NRC Exam (see comment below) (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 5
55.43 5

Comments: 2008 NRC exam Ques. 90 was written for Unit 1. This question is written for Unit 2 which DOES NOT require offsite power to be declared out of service if two ICW trains electrically aligned and operating on the same train. (2008 Ques. 90 answer was D)

PREVIOUS NRC EXAM

Question 90

Given the following conditions:

- Unit 1 is at 100% power
- 1A and 1B Intake Cooling Water pumps are operating on their respective headers
- 1C Intake Cooling Water pump is in standby aligned to the A header
- The 1B Intake Cooling Water pump trips unexpectedly

1) Which ONE of the following states the acceptability of an immediate attempt to restart the 1B Intake Cooling water pump?

2) If the 1C Intake Cooling Water pump valve alignment was configured to the B side but the electrical alignment remained to the A side, what would be the required actions if the pump started?

A. 1) One restart attempt IS allowed for the stated conditions.
   2) The respective offsite power source AND the 1B Intake Cooling train must be declared out of service.

B. 1) One restart attempt IS NOT allowed for the stated conditions.
   2) ONLY the 1B Intake Cooling train must be declared out of service.

C. 1) One restart attempt IS allowed for the stated conditions.
   2) ONLY the 1B Intake Cooling train must be declared out of service.

D. 1) One restart attempt IS NOT allowed for the stated conditions.
   2) The respective offsite power source AND the 1B Intake Cooling train must be declared out of service.

UNIT 1

7.0 OPERATOR ACTIONS

7.1 Immediate Operator Actions:

1. None

7.2 Subsequent Operations Actions:

INSTRUCTIONS	CONTINGENCY ACTIONS

CAUTION
If affected ICW header indicates 0 pressure, the standby pump discharge valve must be throttled prior to starting.

1. If an ICW pump indicates extremely high amps, OR an ICW pump trips unexpectedly, Then:

A. If the health and safety of the public is in jeopardy, Then ATTEMPT **ONLY ONE** restart.

B. Place the pump control switch to PULL TO LOCK position.

C. Then align the standby pump to the header, IAW 2-NOP-21.03A(B)(C), 2A(B)(C) Intake Cooling Water System Operation, and start the standby pump.

C. If an ICW pump cannot be restored to a header, Then:

1. Reduce MVARS to minimum.
2. Monitor Main Generator Gas Temperatures. Refer to 2-ONP-53.01, Main Generator.
3. Reduce turbine load as needed to within the heat removal capability of the TCW system.
4. Isolate S/G blowdown, then place the Open Blowdown heat exchanger TCVs in MANUAL and close.

7.0 OPERATOR ACTIONS

7.1 Immediate Operator Actions

1. None

7.2 Subsequent Operations Actions:

INSTRUCTIONS	CONTINGENCY ACTIONS

CAUTION

- If affected ICW header indicates 0 pressure, the standby pump discharge valve must be throttled prior to starting.
- ¶1 In Modes 1 through 3 (SIAS NOT blocked), when two ICW Pumps are electrically aligned AND operating on the same electrical bus, the respective Off-site Power Source must be declared out of service, as two ICW Pumps could affect the load shed and resequencing loads by the Diesel. REFER to Technical Specifications 3.8.1.1.a.

1. If an ICW pump indicates extremely high amps, OR an ICW pump trips unexpectedly, Then:	**1.**	
A. ¶2 If the health and safety of the public is in jeopardy, Then ATTEMPT **ONLY ONE** restart.		
B. Place the pump control switch to PULL TO LOCK position.		
C. Then align the standby pump to the header, IAW 1-NOP-21.03A(B)(C), 1A(1B)(1C) Intake Cooling Water System Operation, and start the standby pump.	**C.** If an ICW pump cannot be restored to a header, Then:	
	1. Reduce MVARS to minimum.	
	2. Monitor Main Generator Gas Temperatures. Refer to 1-ONP-53.01, Main Generator.	
	3. Reduce turbine load as needed to within the heat removal capability of the TCW system.	

/R41A

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	027A2.01	
	Importance Rating		3.3

Containment Iodine Removal: High temperature in the filter system

Proposed Question: SRO 91

Unit 2 has been in a Large Break LOCA for 48 hours with the following conditions:

- Containment Temperature is 120°F.

1) As Unit Supervisor, in accordance with 2-EOP-03 LOCA, when would you direct starting of Hydrogen Purge fans HVE-7A and / or HVE-7B?

2) If the Hydrogen Purge fans were started the following Annunciator illuminates,

CONT CNTMT/ H_2 PURGE ADSORBER TEMP HIGH X-1

What would be the most likely cause of this alarm?

A. 1) Consultation with the TSC if the Hydrogen Recombiners CANNOT maintain H_2 concentration less than 3.5%
2) Restricted air flow through the filter train

B. 1) Consultation with the TSC if the Hydrogen Recombiners CANNOT maintain H_2 concentration less than 3.5%
2) High Containment temperature

C. 1) Any H_2 concentration when the Hydrogen Recombiners are NOT available
2) Restricted air flow through the filter train

D. 1) Any H_2 concentration when the Hydrogen Recombiners are NOT available
2) High Containment temperature

Proposed Answer: A

Explanation (Optional):

A. Correct
B. Incorrect; High containment temperature will not bring in alarm. Alarm setpoint is 200°F. Outside air makeup should cool the filter train for any containment temperature.
C. Incorrect; containment combustible gas control safety function is met at 0.5% hydrogen. Placing Hydrogen purge in service is last resort Hydrogen concentration control.
D. Incorrect; both part 1 and part 2.

Technical Reference(s): 2-EOP-03 LOCA (Attach if not previously provided)
2-ARP-01-X1

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0702824-09, 0702602-32 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 5
55.43 5

Comments:

4.0 OPERATOR ACTIONS (continued)

INSTRUCTIONS	CONTINGENCY ACTIONS
* **50. Operate H2 Purge System** OPERATE the H2 purge system as directed by the Technical Support Center. **REFER TO** Appendix N, Hydrogen Purge System Operation.	
* **51. Reset Safety Systems** PERFORM **BOTH** of the following: **A.** ENSURE proper actuation of ESFAS components. **REFER TO** Tables 1, 2, 3, 4 and 5 (SIAS, CIAS, CSAS, RAS and MSIS) **AS NECESSARY**. **B.** If **ANY** ESFAS signals have actuated and are no longer needed, Then RESET the appropriate signals. **REFER TO** Appendix P, Restoration of Components Actuated by ESFAS.	

ATTACHMENT 1
SAFETY FUNCTION STATUS CHECK SHEET
(Page 11 of 11)

9. CONTAINMENT COMBUSTIBLE GAS CONTROL

SAFETY FUNCTION	ACCEPTANCE CRITERIA	CHECK √
A. Hydrogen Concentration	Less than 0.5%	☐☐☐☐☐☐
	OR	
B. Hydrogen Recombiners	**ALL** available operating	☐☐☐☐☐☐
	AND	
Hydrogen Concentration	Less Than 3.5%	☐☐☐☐☐☐
	OR	
C. Hydrogen Purge System	As recommended by the TSC	☐☐☐☐☐☐

END OF SAFETY FUNCTION 9

INITIALS RO / SRO / STA ☐☐☐☐☐☐

END OF ATTACHMENT 1

Rev 0A 9/14/05

REVISION:	PROCEDURE TITLE:	PANEL:
0A	ANNUNCIATOR RESPONSE PROCEDURE	X
PROCEDURE NO:		WINDOW:
2-ARP-01-X1	ST. LUCIE UNIT 2	1

ANNUNCIATOR PANEL X

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

CONT CNTMT/ H_2 PURGE ADSORBER TEMP HIGH

X-1

DEVICE:	**LOCATION:**	**SETPOINT:**
TR-25-3	HVCB Panel	Multiple Inputs
Point 2 (TE-25-58)	TR-25-3	200°F rising (high)
Point 3 (TE-25-59)	TR-25-3	200°F rising (high)
Point 4 (TE-25-60)	TR-25-3	200°F rising (high)
Point 5 (TE-25-61)	TR-25-3	200°F rising (high)

ALARM CONFIRMATION:

1. TR-25-3 Points 2 through 5 (Cont Cntmt H_2 Purge Sys HVE-7A/7B Charcoal Adsorb) indicate 200°F and rising.
2. TR-25-3 Point 6 (TE-25-57, Cont Cntmt H_2 Purge Sys HVE-7A/7B After Charcoal Adsorb) indicates 200°F and rising.

OPERATOR ACTIONS:

NOTE

- High charcoal temperatures are postulated to occur only as a result of restricted air flow rates less than 55 cfm.
- Iodine desorption occurs at approximately 300°F and charcoal ignition approximately 640°F.

1. VERIFY proper operation of Continuous Containment/H_2 Purge, as follows:
   - HVE-7A or HVE-7B, Continuous Containment/H_2 Purge Exhaust Fan, RUNNING.
   - FCV-25-20, Cont Cntmt/H_2 Purge Exhaust Isol, OPEN.
   - FCV-25-21, Cont Cntmt/H_2 Purge Exhaust Isol, OPEN.
   - FCV-25-9, Control Vlv Filter Inlet, OPEN.
   - FCV-25-35, Cont Cntmt/H_2 Purge Exhaust Valve, OPEN.
   - FCV-25-28, Control Vlv Bypass, CLOSED.
   - UR-25-1, Point 6, HVAC/CNTMT Purge Flow/Pressure Recorder indicates greater than 55 cfm.
2. If the problem is NOT immediately corrected, Then STOP the running H_2 Purge Exhaust Fan.
3. NOTIFY Chemistry.

CAUSES: This annunciator may be caused by low air flow through the charcoal adsorber or by temperature instrumentation malfunction.

REFERENCES:
1. CWD 2998-B-327 sheets 480 and 1145
2. P&ID 2998-G-879 sheet 3
3. TEDB

/R0A

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	029G2.4.50	
	Importance Rating		4.0

Containment Purge System Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.

Proposed Question: SRO 92

Unit 1 is in Mode 3 performing a Containment (Cntmt) Purge using HVE-8A when the following alarm is received:

CNTMT VACUUM HIGH
P-1

Which ONE of the following:

1) Operator actions should be taken and
2) Identifies the Technical Specification bases for Containment pressure?

STOP HVE-8A Cntmt Purge fan and:

A. 1) manually OPEN FCV-25-1, 2 and 3 Cntmt Purge Makeup Valves.
2) Limit peak containment pressure during steam line break accident conditions. Limit negative pressure differential with respect to annulus atmosphere to prevent Containment structure from exceeding design negative pressure.

B. 1) verify FCV-25-1, 2 and 3 Cntmt Purge Makeup Valves have CLOSED
2) Limit peak containment pressure during steam line break accident conditions. Limit negative pressure differential with respect to annulus atmosphere to prevent Containment structure from exceeding design negative pressure.

C. 1) manually OPEN FCV-25-1, 2 and 3 Cntmt Purge Makeup Valves.
2) Limit peak containment pressure during loss of coolant accident conditions. Limit negative pressure differential with respect to outside atmosphere to prevent Containment structure from exceeding design negative pressure.

D. 1) verify FCV-25-1, 2 and 3 Cntmt Purge Makeup Valves have CLOSED.
2) Limit peak containment pressure during loss of coolant accident conditions. Limit negative pressure differential with respect to outside atmosphere to prevent Containment structure from exceeding design negative pressure.

Proposed Answer: B

Explanation (Optional):

A. Incorrect: manually opening FCV-25-1,2 and 3 can not be performed from the control room. Control room INDICATION only. These valves operate from starting and stopping the Purge fans HVE-8A (B). T.S. basis is correct

B. Correct: HVE-8A should have automatically stopped on negative pressure. When manually stopped, verification of makeup valves closing is performed.

C. Incorrect: manually opening FCV-25-1,2 and 3 can not be performed from the control room. T.S. basis

D. Incorrect: T.S. basis

Technical Reference(s): 1-ARP-01-P1 (Attach if not previously provided)
0711602 Containment and Shield Building Ventilation

Proposed references to be provided to applicants during examination: _____

Learning Objective: PSL OPS SYS 602-16 LPC (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10
55.43 5

Comments:

3/4.6 CONTAINMENT SYSTEMS (continued)

BASES (continued)

3/4.6.1 CONTAINMENT VESSEL (continued)

3/4.6.1.4 INTERNAL PRESSURE

The limitations on containment internal pressure ensure that 1) the containment structural is prevented from exceeding its design negative pressure differential with respect to the annulus atmosphere of 0.70 psi and 2) the containment peak pressure does not exceed the design pressure of 44 psig during steam line break accident conditions.

The maximum peak pressure obtained from a steam line break accident is 41.6 psig. The limit of 2.4 psig for initial positive containment pressure will limit the total pressure to 44.0 psig which is the design pressure and is consistent with the accident analyses.

3/4.6.1.5 AIR TEMPERATURE

The limitation on containment air temperature ensures that the containment vessel temperature does not exceed the design temperature of 264°F during LOCA conditions. The containment temperature limit is consistent with the accident analyses.

3/4.6.1.6 CONTAINMENT VESSEL STRUCTURAL INTEGRITY

The limitation ensures that the structural integrity of the containment steel vessel will be maintained comparable to the original design standards for the life of the facility. Structural integrity is required to ensure that the vessel will withstand the maximum pressure of 39.6 psig in the event of the limiting design basis loss of coolant accident. A visual inspection in accordance with the Containment Leakage Rate Testing Program is sufficient to demonstrate this capability.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	029G2.4.50	
	Importance Rating		4.0

Containment Purge System Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.

Proposed Question: SRO 92

Unit 1 is in Mode 3 performing a Containment (Cntmt) Purge using HVE-8A when the following alarm is received:

CNTMT VACUUM HIGH
P-1

Which ONE of the following:

1) Operator actions should be taken and
2) what possible consequence could occur if Operator actions did NOT occur?

STOP HVE-8A Cntmt Purge fan and:

A. 1) manually OPEN FCV-25-1, 2 and 3 Cntmt Purge Makeup Valves.
   2) Containment internal pressure could exceed the Technical Specification limit of – 4.0 in. H_2O.

B. 1) verify FCV-25-1, 2 and 3 Cntmt Purge Makeup Valves have CLOSED
   2) Containment internal pressure could exceed the Technical Specification limit of – 0.7 PSIG.

C. 1) manually OPEN FCV-25-1, 2 and 3 Cntmt Purge Makeup Valves.
   2) Containment internal pressure could exceed the Technical Specification limit of – 0.7 PSIG.

D. 1) verify FCV-25-1, 2 and 3 Cntmt Purge Makeup Valves have CLOSED.
   2) Containment internal pressure could exceed the Technical Specification limit of – 4.0 in. H_2O.

Proposed Answer: B

Explanation (Optional):

A. Incorrect: manually opening FCV-25-1,2 and 3 can not be performed from the control room. Control room INDICATION only. These valves operate from starting and stopping the Purge fans HVE-8A (B). Containment internal pressure of -4.0 in. H_2O is not correct but plausible due to annunciator setpoint is -4.0 in. H_2O

B. Correct: HVE-8A should have automatically stopped on negative pressure. When manually stopped, verification of makeup valves closing is performed.

C. Incorrect: manually opening FCV-25-1,2 and 3 can not be performed from the control room. Control room INDICATION only. These valves operate from starting and stopping the Purge fans HVE-8A (B).

D. Incorrect: Containment internal pressure of -4.0 in. H_2O is not correct but plausible due to annunciator setpoint is -4.0 in. H_2O

Technical Reference(s): 1-ARP-01-P1 (Attach if not previously provided)
0711602 Containment and Shield Building Ventilation

Proposed references to be provided to applicants during examination: _____

Learning Objective: PSL OPS SYS 602-16 LPC (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10
55.43 5

Comments:

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FCV-25-1, FCV-25-2, FCV-25-3, Containment Purge Makeup Valves

These 48" air-operated, fail-closed, butterfly valves are operated from RTGB 106 [HVCB] by the control switches for Containment Purge Exhaust Fans HVE-8A or HVE-8B. Once HVE-8A or HVE-8B is started, and a vacuum of 0.5" water gauge (wg) between containment and ambient air exists, the valves will open. This ensures that unfiltered/unmonitored backflow through the makeup air valves will not occur. Once open, the makeup valves seal in, and only close on fan shutdown, loss of instrument air, or CIS. Indication for open and close valve position is provided on RTGB 106 [HVCB]. Refer to Figure 7. Leakage testing of containment purge valves is performed in accordance with the Containment Leakage Rate Testing program.

Containment Purge Valve Travel Limit Stops

- Unit 1 Spring Side
  Restriction on the use of all of the Unit 1 containment purge valves require that travel limit stops be employed for Modes 1, 2, 3, 4 to prevent the valve from going beyond 40 degrees of travel open. This is an FSAR requirement. This stop is attached to the spring side of the actuator, which is positioned into the spring assembly and pins the travel limit screw at the 40 degrees position, as shown on Figure 9, thereby limiting full open travel. This opening has been designed such that critical valve parts will not be damaged by DBA-LOCA loads and that the valve will tend to close when dynamic forces are introduced. During refueling operations, it is permissible to allow the travel limit stop, as shown in Figure 10, to be pinned in the full open position, thereby allowing for full open operation. Any positioning of these stops is performed by I&C Valve group personnel.

- Unit 1 Air Side
  The air side of the containment purge valve actuator has a travel limiting stop as well. Its purpose is to maintain the valve fully open on a loss of instrument air. The valve is opened, and then the travel limit screw is run in to the full open position, with the pin on the screw closest to the handwheel as shown on Figure 10. This allows for maintenance personnel to have a backup safety means of keeping these valves

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open for ductwork and butterfly elastomer inspections in the event of a loss of air. Any positioning of these stops is performed by I&C Valve group personnel.

- Unit 2
  Unit 2 travel limit stop is only on the air side of the containment purge valve actuators. Normal on-line configuration is as shown in Figure 11. For maintenance purposes when allowed in refueling or cold shutdown conditions, the travel limit screw may be positioned in as shown in Figure 12. Any positioning of these stops is performed by I&C valve group personnel.

  Although operations procedures refer to the travel limit stops as jacking stops, at no time should they be "jacked" in against air pressure or spring compression. In Modes 1, 2, 3, and 4 the containment purge valves have their actuators pinned and control fuses removed because it could not be demonstrated that they would close in the required amount of time on a Containment Isolation Signal.

Containment Purge Fans, HVE-8A and HVE-8B

The containment purge fans are belt-driven fans that discharge to the plant vent stack. Each fan is rated for 42,000 cfm at 10.5 inches wg static pressure.

- Fans HVE-8A / 8B are powered by MCC 1A5 / 1B5 [2A5 / 2B5]

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The fans are controlled by STOP/START switches that spring return to neutral on RTGB 106 [HVCB].

To start HVE-8A (8B), the following logic must be satisfied:

- CIS Train A and B must be reset.

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- Containment to annulus differential pressure must not be excessive (PDIS-25-11A and 11B ≤ 4" wg [9" wg]).

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Rev 0R 8/14/04

REVISION:	PROCEDURE TITLE:	PANEL:
0	ANNUNCIATOR RESPONSE PROCEDURE	P
PROCEDURE NO:		WINDOW:
1-ARP-01-P1	ST. LUCIE UNIT 1	1

ANNUNCIATOR PANEL P

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

CNTMT VACUUM HIGH

P-1

DEVICE:	LOCATION:	SETPOINT:
63XA1	RTGB-106	De-energized
PDIS-25-11A	RAB/24/N-RA2/W-RAE	-4 in. H_2O
63XB1	RTGB-106	De-energized
PDIS-25-11B	RAB/24/N-RA2/RAF	-4 in. H_2O

ALARM CONFIRMATION:

1. PDIS-25-1A, Containment A ΔP, indicates -4 in. H_2O or more negative.
2. PDIS-25-1B, Containment B ΔP, indicates -4 in. H_2O or more negative.
3. If Containment Purge was in progress, the following is indicated:
   - HVE-8A and HVE-8B, Cntmt Purge Exhaust Fans, indicate STOPPED.
   - FCV-25-7 and FCV-25-8, Vacuum Relief Valves, indicate OPEN.
   - FCV-25-1, 2 and 3, Cntmt Purge Makeup Valves, indicate OPEN.

OPERATOR ACTIONS:

1. If Containment Purge Fans are RUNNING, Then STOP the running fan:
   - HVE-8A, Cntmt Purge Exhaust Fan.
   - HVE-8B, Cntmt Purge Exhaust Fan.
2. If Containment Vacuum Reliefs are CLOSED, Then at the direction of the US, OPEN the valves manually:
   - FCV-25-7, Vacuum Relief Valve.
   - FCV-25-8, Vacuum Relief Valve.

CAUSES: This annunciator may be caused by failure of the purge inlet dampers to open, failure of the containment vacuum relief valves to open, or a misaligned valve lineup.

REFERENCES:

1. CWD 8770-B-327 sheets 366, 509, 510, 511 and 529
2. P&IDs 8770-G-862 and 8770-G-878 sheet 1
3. TEDB

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	034K4.03	
	Importance Rating		3.3

Fuel Handling Equipment: Overload protection

Proposed Question: SRO 93

Unit 2 is performing refueling operations. 2-NOP-67.04 REFUELING MACHINE OPERATION is in use. Appendix F 'Troubleshooting An Overload Condition While Raising a Fuel Assembly' is being implemented due to an overload condition.

The Refueling Machine operator questions the Refueling SRO if Programmable Logic Controller (PLC) override can be used to override the overload and raise the fuel bundle.

As the Refueling SRO, which ONE of the following responses would you give to the Refueling Machine operator and why?

PLC override is:

A. NOT allowed for the above conditions. PLC override is only to be used to place a fuel bundle in a safe condition for specific equipment failures.

B. NOT allowed for the above conditions. PLC override is only to be used for preoperational testing of the Refueling Machine interlocks prior to fuel movement.

C. ALLOWED to be used for the above conditions. PLC override does not override the Technical Specification overload cut off limit.

D. ALLOWED to be used for the above conditions but only after the Bridge and Trolley manual positioning is not successful in clearing the overload condition.

Proposed Answer: A

Explanation (Optional):

A. Correct
B. Incorrect; PLC override is used during pre-op testing but procedure guidance states override is to be used to place the fuel bundle in a safe condition in the event of a computer failure
C. Incorrect; PLC override not allowed but it is true it does not override the T.S. limit on overload
D. Incorrect; Appendix has manipulations to move the bridge and trolley, but PLC override not mentioned and not allowed.

Technical Reference(s): 2-NOP-67.04 Refueling Machine Operation (Attach if not previously provided)

0711208 Refueling Equipment

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0702208-06 (As available)

Question Source: Bank # _____

Modified Bank # _____ (Note changes or attach parent)

New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 _____

55.43 6,7

Comments:

Rev 0K
8/14/08

4.0 PRECAUTIONS / LIMITATIONS

4.1 General

1. Do NOT take any unnecessary items into the refueling cavity.
2. All personal items (glasses, pencils, personal monitors, etc.), shall be tied or taped to prevent them from falling into the cavity.
3. Each person should inventory personal items they take into the refueling cavity.
4. No loose items should be stored on the Refueling Machine unless tethered to a person or machine.
5. A Radiation Work Permit (RWP) shall be in effect that covers the scope of the work to be performed.
6. Health Physics should be notified and approval obtained for any use of the Refueling Machine.
7. No articles shall be removed from the Refueling Cavity unless Health Physics is present to monitor radiation levels during the removal process.
8. Prior to flooding the refueling cavity, check out all underwater equipment.
9. The hoist shall never be raised above the Hoist Up Limit with a fuel bundle attached.
10. Health Physics shall monitor any hoist movement above the Hoist Up Limit even without a fuel bundle attached.
11. Operation with the COMPUTER OVERRIDE switch in OVRD bypasses all PLC interlocks. It is intended for emergency use only to allow a fuel bundle to be placed in a safe condition in the event of a Programmable Logic Controller (PLC) failure.
12. An SRO or refueling SRO shall be in containment to supervise fuel movement and maintain oversight of activities in containment and the spent fuel pool.
13. Rotation of the Refueling Machine mast while at up limit may cause loss of the Hoist Up Limit permissive. This may cause an automatic sequence to abort and may prevent the machine from performing functions that require the hoist to be at up limit.

6.12 Abnormal Events (continued)

NOTE

There is NO alarm associated with an I/O system failure. If the machine halts unexpectedly while moving OR will not move on any axis, consider the possibility of an I/O system failure.

7. I/O System Failure Actions INITIAL

A. STOP all movement of the Fuel Transfer Machine. _____

B. NOTIFY the Refueling SRO / Refueling Center of the I/O System failure. _____

NOTE

The Refueling SRO may authorize a reboot to attempt to clear the fault table. Rebooting is accomplished by turning OFF then ON at the Operator Console.

C. REBOOT to Clear the fault table. _____

CAUTION

Operation with the COMPUTER OVERRIDE switch in OVRD bypasses all PLC interlocks and the potential exists for equipment damage. It is intended for emergency use only to allow a fuel bundle to be placed in a safe condition in the event of a Programmable Logic Controller (PLC) failure.

D. If rebooting does not reset the operation of the Refueling Machine AND a fuel assembly or load must be placed in a safe location, Then with Refueling SRO concurrence, PLACE the Computer Override keyswitch in OVRD. _____

E. CONTACT SCE (PSL Engineering) for assistance. _____

END OF SECTION 6.12

Rev 0LL
07/14/05

REFUELING OPERATIONS

MANIPULATOR CRANE OPERABILITY

LIMITING CONDITION FOR OPERATION

3.9.6 The manipulator crane shall be used for movement of CEAs or fuel assemblies and shall be OPERABLE with:

a. A minimum capacity of 2000 pounds, and

b. An overload cut off limit of $\leq$ 3000 pounds.

APPLICABILITY: During movement of CEAs or fuel assemblies within the reactor pressure vessel.

ACTION:

With the requirements for crane OPERABILITY not satisfied, suspend use of any inoperable manipulator crane from operations involving the movement of CEAs and fuel assemblies within the reactor pressure vessel.

SURVEILLANCE REQUIREMENTS

4.9.6 The manipulator crane used for movement of CEAs or fuel assemblies within the reactor pressure vessel shall be demonstrated OPERABLE within 72 hours prior to the start of such operations by performing a load test of at least 2500 pounds and demonstrating an automatic load cut off before the crane load exceeds 3000 pounds.

APPENDIX F
TROUBLESHOOTING AN OVERLOAD CONDITION WHILE RAISING A FUEL ASSEMBLY
(Page 1 of 2)

NOTE
If several assemblies are consistently off by two or more tenths in the same direction, consider checking benchmarks to ensure proper Refueling Machine alignment.

1. DETERMINE if assembly being lowered into the core is slightly coming in contact with another assembly, using binoculars.

2. If so, Then PERFORM the following:

   A. LOWER the hoist until the load cell reads between 1300 and 1400 lbs.

   B. ROTATE mast, as follows:

      1. REMOVE the detent pin.

      2. TURN the handwheel to move the mast approximately 10 degrees in either direction.

      3. MONITOR the load cell.

   C. RAISE the hoist.

   D. MONITOR the load cell for indication of an overload condition.

APPENDIX F
TROUBLESHOOTING AN OVERLOAD CONDITION WHILE RAISING A FUEL ASSEMBLY
(Page 2 of 2)

NOTE
If another assembly is leaning excessively into the path of the assembly being withdrawn from the core, the RFM can be manually positioned in the direction away from the leaning assembly.

3. If another assembly is leaning excessively into the path of the assembly being withdrawn from the core, Then PERFORM the following:

   A. LOWER the hoist until full assembly weight is shown on the load cell.

   B. OPERATE the RFM manually in accordance with Section 6.3, RFM Manual Indexing From RFM Console.

   C. ADJUST the Bridge / Trolley position of the Refueling Machine 0.2 inches while monitoring the digital position indicator.

NOTE
If a hoist position where the original overload condition is reached and the overload no longer exists, the assembly has passed the obstruction.

   D. LOWER the Hoist while watching load cell for an overload condition.

   E. If a hoist position where the original overload condition is reached and the overload no longer exists, Then PERFORM the following:

      1. RETURN THE RFM to its original position for the assembly being withdrawn.

      2. RETURN the RFM to power operation in accordance with Section 6.3, RFM Manual Indexing From RFM Console.

      3. RAISE the assembly while monitoring the load cell.

   F. If the overload persists, Then NOTIFY the Refueling Supervisor that additional adjustments may be required.

END OF APPENDIX F

CONTROL CONSOLE VERTICAL PANEL

	COMPONENT	POSITION	INDICATION	FUNCTION
1.	Heater On light/Test Pushbutton		Red light	Auto on when power off. Pushbutton for lamp test.
2.	Hoist Overload light		Red light	Lit during overload
3.	Hoist Underload light		Red light	Lit during underload
4.	Hoist Max Overload light		Red light	Lit when a pre-set maximum overload setpoint has been exceeded (independent of PLC)
5.	Override Active Light		Red light	Lit Indicating that Override Keyswitch is in the OVRD position (PLC bypassed)
6.	Override Active Keyswitch	OVRD	Red light	Allows bypassing the PLC (emergency use only)
7.	FLAT SCREEN MONITOR		Various refueling functions/activities	Information display including diagnostics and interactive command function capability
8.	Cable load		Digital Meter	Monitors load on fuel hoist cable
9.	Upender Vertical light		Green light	ON when reactor side Upender is vertical
10.	Travel Override Pushbutton/light	Momentarily depressed	Red light	Lights when bridge or trolley violates a secure zone (pushbutton allows slow speed outside secure zone)
11.	Main Power On Pushbutton/light	Momentarily depressed	White light	Supplies or secures refueling machine power including A/C unit (ON when power is on)
12.	Main Power Off	Momentarily depressed	None	Secures power to machine

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	G2.1.1	
	Importance Rating		4.2

Conduct of Operations: Knowledge of operations requirements

Proposed Question: SRO 94

Unit 2 has tripped due to the loss of the 2A Main Feedwater Pump. Upon the trip a Main Steam Safety Valve (MSSV) on the 2A Steam Generator stuck open and has failed to reseat. A Steam Generator Tube leak on the 2B S/G was identified post trip. S/G Blowdown radiation monitors are in alarm. The crew has entered 2-EOP-15 Functional Recovery. The MSIV's were closed and the following conditions exist:

- 2A S/G pressure is 710 psia lowering.
- 2B S/G pressure is 790 psia stable.

1) Which ONE of the following S/G's is considered the MOST AFFECTED S/G?
2) When is the faulted S/G considered NO LONGER FAULTED and what EOP will be utilized when the SG is no longer considered faulted?

A. 1) 2B S/G.
   2) When the MSSV is gagged. Remain in EOP-15

B. 1) 2B S/G
   2) When EOP-99 Appendix R 'Steam Generator Isolation' is complete. Exit to EOP-04 Steam Generator Tube Rupture.

C. 1) 2A S/G
   2) When the MSSV is gagged. Remain in EOP-15

D 1) 2A S/G
   2) When EOP-99 Appendix R 'Steam Generator Isolation' is complete. Exit to EOP-04 Steam Generator Tube Rupture.

Proposed Answer: C

Explanation (Optional):

A. Incorrect: Most affected SG is 2A, part two is correct
B. Incorrect: Most affected SG is 2A, Ops Policy requires MSSV to be gagged to be considered NO LONGER FAULTED
C. Correct
D. Incorrect: 2A SG is LEAST AFFECTED, part two incorrect, MSSV required to be gagged to be NO LONGER FAULTED

Technical Reference(s): Operations Department Policy: (Attach if not previously provided)
OPS-521 Emergency Operating Procedure Implementation
0702828 Functional Recovery

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0702828-07 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 10
55.43 5

Comments:

1. J. (continued)

6. Manual initiation of AFAS should NOT be done during other scenarios because it defeats the rupture identification circuit. This does NOT prevent a crew decision to manually operate AFW components, start pumps and open valves, if deemed necessary.

7. ESFAS Actuation: Use of ESF Override features in EOPs

a. When opening a valve that was closed by SIAS or CIAS, increased awareness / monitoring should be employed on that system to detect a release to the environment via that flow path.

b. Increasing RAB radiation indications, loss of Containment sump inventory and unexpected Containment depressurization are all examples of Containment boundary leakage which may have been created by operator action, and should be considered when taking these type of actions.

K. Manual Override of MFIV Following AFAS Actuation (Unit 2):

1. Do NOT override and open MFIV from within EOP-1. This overrides a safeguard signal prior to diagnosing the event.

L. CCW to RCPs:

1. SPTAs take precedence over restoring CCW.

2. Restore CCW to RCPs when an RCO is available AND the attention required to restore does NOT adversely affect the maintenance or recovery of other safety functions.

M. Excess Steam Demand event guidance while implementing EOP-05, Excess Steam Demand, and EOP-15, Functional Recovery.

1. Regardless of the rate of RCS pressure and inventory reduction during an Excess Steam Demand, RCS pressure SHALL NOT be intentionally lowered to enhance inventory addition into the RCS unless the RCS Inventory Control Safety Function can NOT be maintained otherwise.

2. If a Main Steam Safety Valve is stuck open, or was stuck open, causing entry into an EOP, Then the affected Steam Generator shall be considered faulted until the Safety Valve is gagged, even if the Safety Valve reseats. The Steam Generator shall NOT be unisolated until the Safety Valve is gagged.

e. RCS and Core Heat Removal (HR)

The success paths for RCS and core heat removal contain some optimal guidance for SGTR, ESDE, and TLOF (i.e., steps to initiate Once Through Cooling or guidance not to initiate OTC if no HPSI is available).

When monitoring the RCS temperature during forced circulation conditions, THOT is the heat indicator. During all other conditions CET indication shows the most accurate state of the core fluid. (i.e. during safety injection the Tc RDT's are influenced by injection water) CEN-152.

f. Containment Isolation (CI)

Explain that if a steam generator tube rupture exist, containment isolation can not be met until the most affected S/G is isolated.

g. Containment Temperature and Pressure Control (CTPC)

h. Containment Combustible Gas Control (CCGC)

Explain: TSC must agree to H_2 purge success path prior to use.

7. Long Term Actions

EO-2

These actions should be pursued concurrently with the TSC.

a. Determine Plant Status

b. Cooldown necessary

Due to the event a standard cooldown may not be achievable.

c. Coldown Feasible

E. MULTIPLE EVENT STRATEGY

1. Simultaneous ESD and SGTR

EO-7A

a. The Containment Isolation Safety Function will not be met for this dual event due to secondary activity and the most affected SG (ESD SG has yet to be isolated). Assuming other safety functions are being met, the US implements CI-1 Success Path first. CI-1 will direct him to Heat Removal Success Path HR-1 or HR-2 as appropriate where he will isolate the most affected S/G (in this case it is the one with the ESD). He then returns to CI-1 and completes the procedure in the normal fashion.

Note: If the S/G with the SGTR is required to be steamed, then CI-1 will only be met when the ESD SG is isolated (no steam release) and the most affected SG pressure is <930 psia.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	G2.1.9	
	Importance Rating		4.5

Conduct of Operations: Ability to direct personnel activities inside the control room

Proposed Question: SRO 95

Unit 2 has tripped from 100% power. A Loss Of Offsite Power (LOOP) occurred during the trip. The following conditions were noted immediately after the trip:

- 2A EDG is running with its output breaker closed.
- 2B EDG is running but its breaker failed to close, no abnormal alarms noted.
- Steam Generator pressures are 1000 psia.
- RCS pressure is 2200 psia stable.
- ONLY the 2A Charging pump is running.
- Pressurizer level is 35% slowly lowering.
- ONE CEA is at the Upper Electrical Limit (UEL).

Which ONE of the following directions can be given to the RCO's prior to formal entry into 1-EOP-01 Standard Post Trip Actions?

A. Direct RCO to contact the field operator to perform Appendix X, direct RCO to close MSR TCV's.

B. Direct RCS depressurized to between 1800-1850 psia, direct start of 2C Charging pump.

C. Direct RCO to close the MSIV's, direct RCO to emergency borate.

D. Direct ADV's operated to control Steam Generator pressure, direct one attempt to close the 2B EDG output breaker.

Proposed Answer: D

Explanation (Optional):

A. Incorrect: US does not direct RCO to contact field operator. RCO announces unit trip and requests Field Operator call the control room. MSR TCV closure is performed by RCO as contingency actions if MSR block valves did not close.
B. Incorrect: RCS is depressurized to 1800-1850 in EOP-09 LOOP to protect RCP seals. 2C Charging pump would not be started, Pressurizer level is within safety function range.
C. Incorrect: MSIV's are closed in EOP-09 LOOP to protect the main condenser. Emergency Borate not required with ONE CEA not fully inserted.
D. Correct: US will give direction post trip to stabilize the plant prior to formal entry into EOP-01 Standard Post Trip Actions.

Technical Reference(s): Operations Department Policy OPS-521 Emergency Operating Procedure Implementation (Attach if not previously provided)

2-EOP-01

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0702822-09 (As available)

Question Source: Bank # _____

Modified Bank # _____ (Note changes or attach parent)

New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10

55.43 5

Comments:

1. H. (continued)

3. If a Safety Function is not being met or a contingency action must be taken, that information must be communicated to the US. The US will direct these contingency actions. This communication will utilize 4-parts.

4. Following completion of the Immediate Actions, the SM, US and RCOs should spend approximately one minute assessing plant status and acknowledging alarms.

   During this time the Desk RCO should:

   a. Announce on the Gaitronics **"Attention all Plant Personnel, the Unit 1 (2) Reactor has tripped."**

   b. NOTIFY the NPO to perform Appendix X, Section 1 of EOP-99

   c. CONTACT the STA and Shift Communicator to report to the Control Room and

   d. Close the MSR TCV block and/or warm-up valves.

   e. While the US and BRCO are performing the Inventory and/or Pressure Control safety function, the DRCO should CLOSE MV-08-814.

   The US / SM should:

   f. Mentally perform EOP-1 to quickly assess the status of the plant.

   g. Actions required to stabilize the plant may be taken at that time. (e.g., close an EDG breaker, start a charging pump, manually control S/G pressure)

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Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	G2.2.17	
	Importance Rating		3.8

Equipment Control: Knowledge of the process for managing maintenance activities during power operations

Proposed Question: SRO 96

Which ONE of the following work activities are examples that are controlled by:

1) 0-ADM-80.01 CONTROL OF FIX IT NOW / MINOR MAINTENANCE WORK ACTIVITIES?
2) What work activities require the SRO / Shift SRO permission to start?

A. 1) Adjusting packing on pumps that are Quality AND Safety Related.
   2) Work that involves installed plant equipment within the power block.

B. 1) Adjusting packing on pumps that are Quality Related equipment ONLY.
   2) Work that involves installed plant equipment within the power block.

C. 1) Minor welding on Quality Related OR Safety Related equipment.
   2) Work activities that require a Equipment Clearance Order.

D. 1) Minor welding on Quality Related equipment ONLY.
   2) Work activities that require a Equipment Clearance Order.

Proposed Answer: B

Explanation (Optional):

A. Incorrect: minor maintenance NOT permitted on Safety Related Pumps, although minor maintenance IS allowed on some Safety related equipment.
B. Correct: maintenance allowed on Quality Related. SRO required to approve power block work
C. Incorrect: minor welding NOT allowed on Safety related equipment.
D. Incorrect: minor welding NOT allowed on Quality related equipment

Technical Reference(s): 0-ADM-80.01 Control of Fix It Now / Minor Maintenance Work Activities. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0904724-02 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 10
55.43 5

Comments:

7.3 Minor Maintenance Work Control Process: (continued)

6. (continued)

D. In addition to the above requirements, minor maintenance work orders which require an equipment clearance shall be reviewed by the Fin SRO prior to implementation to ensure there are no conflicts with scheduled POD activities or operational requirements.

7. Minor Maintenance work orders that involve the removal of grating clips shall include Supervisor / GML signoff for verification of the re-installation of grating clips.

8. The planned duration of any job worked under minor maintenance is normally limited to having the work completed on the same day but may be extended by the Supervisor.

9. Minor Maintenance Work Orders shall be reviewed and verified as Minor Maintenance by the specific departments Production Supervisor and the Verified Minor Maintenance Field signed and dated prior to commencement of field work.

10. Fin SRO / Shift SRO permission to start work is required for any Minor Maintenance Work Order that involves work activities which could affect unit operation or involves installed plant equipment within the power block.

A. The Fin SRO / Shift SRO / Shift Manager shall document permission to start work by signing and dating the Minor Maintenance Work Orders. Security shall be notified prior to work on security related equipment.

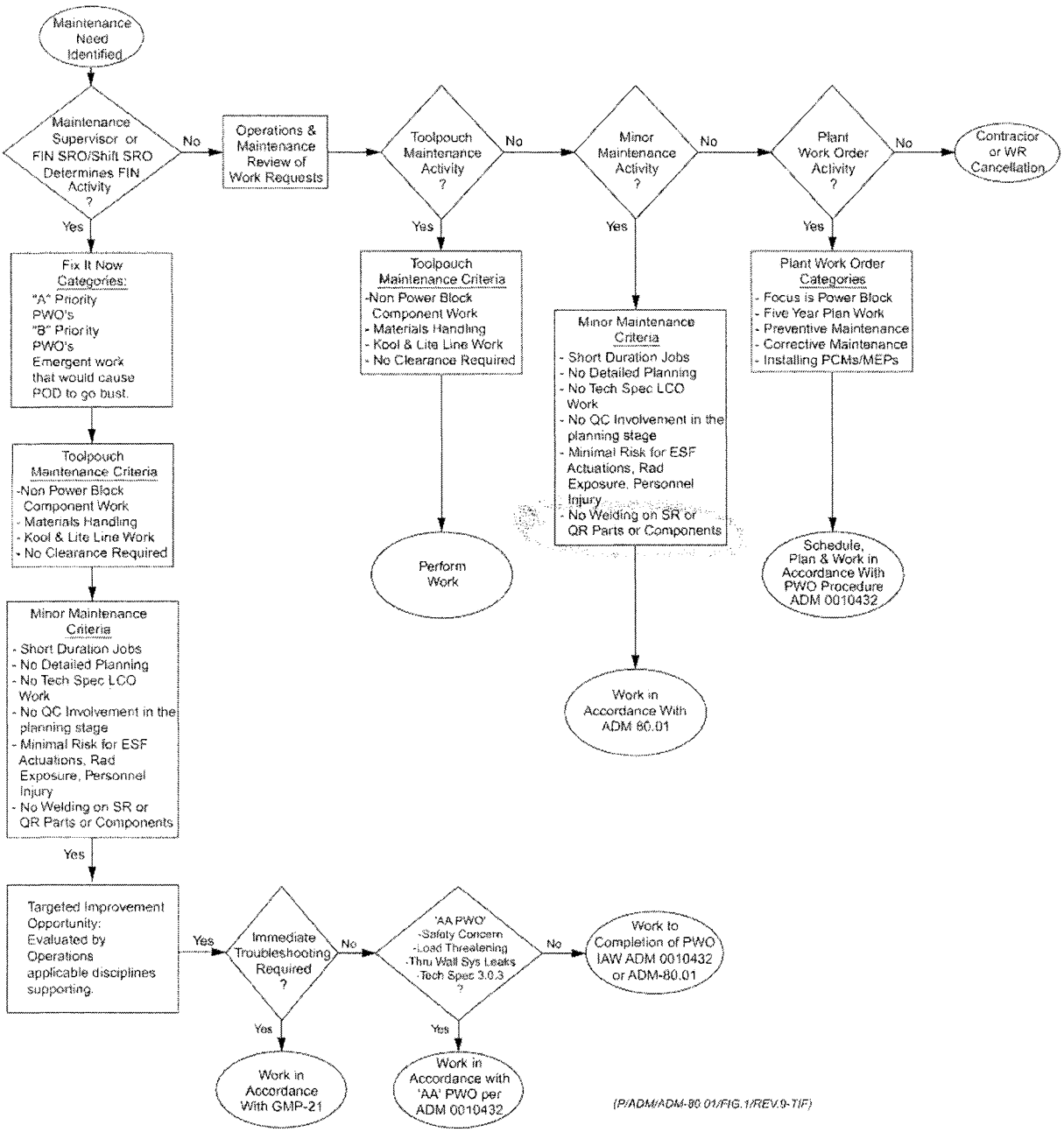
11. Work performed shall be summarized and parts documented in the Work Performed Section of the Minor Maintenance Work Order and the Journeyman / GML / Supervisor shall date and sign.

12. The Deficiency Tag shall be removed and EOOS sections shall be completed.

13. For work reports requiring more than one page, utilize a form similar to Attachment 2, Page 1 of 1.

14. The Work Performed section shall be reviewed by Supervisor / Foreman / Chief / GML. Security related work orders may require review by Security Shift Specialist.

FIGURE 1
MINOR MAINTENANCE FLOW PROCESS
(Page 1 of 1)



(P/ADM/ADM-80.01/FIG.1/REV.9-TIF)

APPENDIX A
CHECKLIST TO DETERMINE MINOR MAINTENANCE
(Page 3 of 4)

EQUIPMENT	NNS	QR	SR	ACTIVITY	LIMITATIONS
Motors / Pumps Compressors / Fans	X	X	X	Draw oil samples	
	X	X	X	Add oil	
	X	X	X	Replace filters	
	X	X	X	Lubricate	
Motors	X			Disconnect / Reconnect (75 HP or less)	N/A for EQ
Panels / Consoles	X	X	X	Replace missing covers / screws*	
Piping / Fittings	X	X		Replace caps* / Repair pipe thread / Replace fittings*	
Pneumatic circuits / loops	X	X		Troubleshoot	Use GMP-21 or specific instructions for SR equip.
	X			Repair / Replace	
	X	X		Calibration check	
	X			Calibrate	
Pumps	X	X		Adjust packing / Cooling Water Flow	
	X			Replace packing / Minor repair / Simple alignment / Coupling repair / replace, complete pump replacement	
Security Equipment	X	N/A	N/A	Repair Doors and Gates	Notify Fire Protection for impact of work to be performed on security fire barrier doors to determine if fire breach permit will be needed. No modification to door or its mounting hardware may be performed under minor maintenance.
	X	N/A	N/A	Repair Equipment and Building Systems	
Strainers	X	X		Install / Remove / Replace / Repair / Clean*	
Temperature Indicators	X	X		Calibrate / Replace / Repair*	
Temporary Pipe Caps	X	X	X	Install / Remove / Replace*	
Terminal / Pull Boxes	X	X	X	Replace missing covers / screws*	

NOTES:
Minor Maintenance may not be performed on Equipment with Safety Classifications blacked out.
N/A indicates Safety Classification is not applicable. Use Minor Maintenance.
*Replacement parts shall be consistent with component quality group, parts application, and specified component configuration.
Welding permitted on non-safety related, non-quality related, non-seismic structural or piping categories 6, 7, 8 when final V.T. inspection is required.
Fire Impairments or Barrier Breach Requests will be documented PRIOR to any plant breach.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	G2.2.43	
	Importance Rating		3.3

Equipment Control: Knowledge of the process used to track inoperable alarms

Proposed Question: SRO 97

Unit 1 is at 100% power steady state. The following annunciator was alarming approximately every 30 minutes for the past 8 hours. I/C has determined a faulty circuit is causing the alarm. The annunciator has been defeated for 10 days.

STEAM BYPASS DEMAND	
	K-6

1) The above annunciator was:
2) The annuncaitor is tracked by:

A. 1) CONSIDERED a nuisance annunciator.
   2) ADM-17.18 'Temporary System Alteration'

B. 1) CONSIDERED a nuisance annunciator
   2) ADM-09.03 'Administrative Control Of Defeated Annunciators'

C. 1) NOT CONSIDERED a nuisance annunciator.
   2) ADM-17.18 'Temporary System Alteration'

D. 1) NOT CONSIDERED a nuisance annunciator.
   2) ADM-09.03 'Administrative Control Of Defeated Annunciators'

Proposed Answer: A

Explanation (Optional):

A. Correct: Annunciator is considered a nuisance annunciator that alarms greater than or equal to 8 times in a consecutive 8 hour period. Transfer of tracking defeated annunciator must be performed by ADM-17.18 Temporary System Alteration if annunciator defeated greater than 7 days.
B. Incorrect: Control of defeated annunciator performed by ADM-09.03 Administrative Control of Defeated Annunciators for a MAXIMUM of 7 days.
C. Incorrect: Annunciator is a nuisance annunciator due to alarming greater than 8 times in a consecutive 8 hour period
D. Incorrect: Annunciator is a nuisance annunciator due to alarming greater than 8 times in a consecutive 8 hour period

Technical Reference(s): ADM-09.03 Administrative Control of Defeated Annunciators (Attach if not previously provided)

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0904724-02 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 10
55.43 5

Comments:

3.0 RESPONSIBILITIES

3.1 Requestor / Originator

Each individual requesting that an annunciator be defeated shall be responsible for the following:

1. Ensure NPWO(s) submitted to correct nuisance condition.

2. Recommendation that an annunciator is a nuisance annunciator.

3. Recommendation of the method for defeating the annunciator's input process signal that causes the nuisance condition.

4. Recommendation of the compensatory monitoring measures necessary to monitor the defeated input process signal while the annunciator is defeated.

5. Recommendation of the restoration and testing method for restoring the defeated annunciator to service.

3.2 Shift Manager (SM)

The SM is responsible for the following:

1. Determination that an annunciator is a valid nuisance annunciator.

2. Determination that defeating the nuisance annunciator is appropriate.

3. Approval of the method used to defeat the nuisance annunciator input process signal.

4. Approval of the compensatory monitoring measures utilized to monitor the defeated input process signal while the annunciator is defeated.

5. Approval of the restoration and testing methods for defeated annunciators.

6. Ensure the defeated annunciator is entered in the Equipment Out of Service Log.

7. Ensuring that defeating the annunciator does NOT require a License Amendment Request.

8. Ensuring that compensatory monitoring measures are performed for all defeated annunciators.

9. Ensuring that the time limit for defeating annunciators is NOT exceeded.

10. Ensuring that defeated annunciators are returned to normal operation in a timely manner.

3.3 Appropriate Engineer

The Appropriate Engineer for the system associated with the defeated annunciator is responsible for the following:

1. Evaluating the request to ensure that the recommended defeated input process signal alters only the defeated annunciator.

2. Evaluating the request to ensure that the recommended defeated input process signal compensatory monitoring measures are adequate.

3. Evaluating the request to ensure that defeating the annunciator will NOT result in a required License Amendment Request.

4.0 DEFINITIONS

4.1 Appendix A, Defeated Annunciator Worksheet

Appendix A, Defeated Annunciator Worksheet is any form similar to that of Appendix A that contains the same or more information pertaining to the process of defeating an annunciator.

4.2 Appendix B, Defeated Annunciator Log Sheet

Appendix B, Defeated Annunciator Log Sheet is any form similar to that of Appendix B that contains the same or more information pertaining to the process of administratively tracking a defeated annunciator.

4.3 Compensatory Monitoring Measures

Compensatory monitoring measures are increased surveillances of the defeated input process signal parameter(s) required to adequately monitor the affected system.

4.4 Defeated Annunciator

An annunciator which is prevented from providing visual and/or audible indication of the input process signal's relationship to an alarm setpoint.

4.5 Nuisance Alarm

A nuisance annunciator is an annunciator that alarms greater than or equal to eight (8) times in a consecutive eight (8) hour period.

6.0 INSTRUCTIONS

6.1 Identification of Nuisance Annunciators

1. Operations Department Watchstanders will identify a nuisance annunciator.
2. The Shift Manager shall determine if the suspected annunciator is a nuisance annunciator.
3. Maintenance Disciplines shall be notified by Nuclear Plant Work Order (NPWO) of the existence of nuisance annunciators.

END OF SECTION 6.1

6.4 Tracking of Defeated Annunciators

1. Following Shift Manager's approval to defeat an annunciator, Appendix A, Defeated Annunciator Worksheet, and Appendix B, Defeated Annunciator Log Sheet, shall be maintained in the Unit's Equipment Out of Service Log.

2. Each shift, the Shift Manager shall review all defeated annunciators to determine if any defeated annunciator may be returned to service.

A. The Shift Manager shall expedite efforts to correct problems with the defeated annunciator such that the annunciator may be returned to service as soon as possible.

B. Actions in progress to correct problems associated with the defeated annunciator should be communicated to the Unit Supervisor (US).

C. Compensatory monitoring measures shall be reviewed and communicated to the Unit Supervisor (US).

3. A defeated annunciator shall NOT be administratively controlled under this procedure for more than seven (7) consecutive days.

A. The annunciator shall be considered defeated at the date and time of Shift Manager Approval to defeat the annunciator.

B. Prior to exceeding the seven (7) day time limit, one of the following measures shall be satisfied:

1. Restore the annunciator to normal operation, including testing of the annunciator. (Ref 3.C.1)

OR

2. Temporary circuit modifications to be installed on components that are out of service, i.e., in the Out of Service Log, may be excluded from the TSA process and controlled under a Work Order using IMP-100.01, I&C Department Forms, Appendix 4. (Ref 3.C.2)

OR

3. Implement ADM-17.18, Temporary System Alteration, and transfer administrative control of the defeated annunciator from ADM-09.03, Administrative Control of Defeated Annunciators to ADM-17.18, Temporary System Alteration. (Ref 3.C.3)

/R7A /R7C

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	G2.2.11	
	Importance Rating		4.3

Radiation Control: Ability to control radiation releases

Proposed Question: SRO 98

Unit 1 is operating at full power. Given the following events and conditions:

- A radioactive liquid release is in progress from the 1B waste monitor storage tank.
- Liquid Release Permit # 09-36 was issued to authorize this release.
- After 30 minutes, liquid radwaste discharge radiation monitor channel R-6627 (channel #43) alarms, the monitor indicates off-scale HIGH.
- The Desk RCO reports that all the actions of ONP 1-0510030, *Uncontrolled Release of Radioactive Liquids*, have been completed.
- I&C reports that Channel R-6627 has failed HIGH and will be out of service for at least 60 days.

Which ONE of the following statements correctly describes the required actions to properly complete the discharge from the 1B Waste Monitor Storage Tank?

A. Restart the release using permit #09-36 with periodic grab samples in lieu of an OPERABLE radiation monitor.

B. Issue a new release permit with independent sample and valve lineup verifications.

C. Restart the release using permit #09-36, after independently verifying the release rate calculations.

D. Issue a new release permit using periodic grab samples in lieu of an OPERABLE radiation monitor.

Proposed Answer: B

Explanation (Optional):

A. Incorrect: New release permit must be issued. Independent sample and valve lineup required. Periodic grab samples not acceptable
B. Correct: New release and independent sample and valve lineup required.
C. Incorrect: New permit required
D. Incorrect: Periodic grab samples not acceptable.

Technical Reference(s): 1-NOP-06.01 Controlled Liquid Release to the Circulating Water Discharge. (Attach if not previously provided)

1-0510030 Uncontrolled Release of Radioactive Liquids

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0702856-07 (As available)

Question Source: Bank # X (2004 NRC EXAM)

Modified Bank # _____ (Note changes or attach parent)

New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 11

55.43 4

Comments:

3.0 PREREQUISITES — INITIAL

3.1 Electrical power is available to the following pumps:

1. 1A Waste Monitor Pump Bkr. 1-40948 _____

2. 1B Waste Monitor Pump Bkr. 1-41756 _____

3. Liquid Waste Control Panel (LWCP) PP-109, Ckt. 18 _____

4.0 PRECAUTIONS / LIMITATIONS

4.1 Prior to release, the tank contents shall be sampled, analyzed and a Liquid Release Permit (LRP) prepared and approved. Once a sample has been drawn for release purposes, radioactive waste shall NOT be added to the tank.

4.2 The Operator shall perform a release only after receipt of an approved Liquid Release Permit. Form similar to Figure 1.

4.3 The Liquid Waste Monitor shall be in service during a release and frequently observed to assure that the count rate is below the trip point settings as noted on the Release Permit. If the Liquid Waste Monitor is determined to be inoperable, refer to C-200, Offsite Dose Calculation Manual (ODCM), Section 3.3.3.9 for required actions and provisions to proceed with the release.

4.4 If activity reaches the high rate trip setpoint as indicated on the Release Permit, an alarm is activated in the Control Room and Flow Control Valve FCV-6627X trips closed. FCV-6627X may be closed from RTGB-105 to terminate the release at the Operator's discretion. Do not re-initiate a liquid release that has been terminated by a monitor alarm until authorized by the Chemistry Department.

4.5 The minimum number of circulating water (CWP) and/or Intake Cooling Water Pumps (ICWP) should be in service during a release as specified by the Liquid Release Permit. Even though not desirable, a release may be made with only ICW pumps for dilution if administrative limits are not exceeded.

4.6 NORMAL/CUTOUT Switches bypass (cutout) the Tank low level switch that stops the associated Pump on low level. This may be desirable when pumping down a tank for maintenance or inspection. When in this configuration, an Operator should remain on location to stop the Pump when the desired level is reached and to prevent damage to the Pump. The Switches for the Waste Monitor Pumps/Tanks are interconnected. If one Tank reaches its respective low level cutout, the NORMAL/CUTOUT Switch for its associated Pump must be placed in the CUTOUT position in order for either Pump to operate. When level in the affected tank has been restored, the switch should be restored to the NORMAL position to prevent damage to the Pump. Manipulation of these Switches on the Liquid Waste Control Panel should be performed with the concurrence of the NWE/US.

6.0 INSTRUCTIONS INITIAL

6.1 Initial Conditions

1. ENSURE Section 3.0, Prerequisites, completed. _____

2. REVIEW Section 4.0, Precautions / Limitations. _____

3. IF diving operations are in progress in the discharge canal, NOTIFY the diving operations supervisor to ensure that divers are out of the water before starting the release and DO NOT re-enter into the water before the end of the liquid release. _____ /R15

4. REVIEW the Liquid Release Permit for appropriate signatures under AUTHORIZATION.

Permit Number_____

Tank releasing_____

CAUTION
If the Liquid Waste Monitor is Out of Service, C-200, ODCM Control 3.3.3.9 requires two independent tank sample / analysis and two independent valve alignments to verify the discharge line valving.

5. ¶1 REVIEW the Equipment Out of Service Log and determine if Channel R-6627, Liquid Waste Monitor has been declared Out of Service.

6. If Channel R-6627 is Out of Service OR the affected Waste Monitor Tank is to be drained completely, Then PERFORM the following: /R15

		YES	NO
A.	Has Chemistry attached two independent Radioactivity analysis of the tank to the Release Permit?	____	____
B.	Has Chemistry attached two independent Release Rate Calculations for the tank on the Release Permit?	____	____
C.	Have you arranged for independent verification of the discharge valve alignment?	____	____

If the answer to any of the above questions is "No", Then **STOP**, do not approve the Liquid Release Permit.

END OF SECTION 6.1

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	G2.4.19	
	Importance Rating		4.1

Emergency Procedures/Plans: Knowledge of EOP layout, symbols and icons

Proposed Question: SRO 99

ATTACHMENT 3

Safety Functions	Success Paths	Checkoffs 1	Checkoffs 2
Reactivity Control	RC-1, CEA Insertion	X	X
	RC-2, Boration via CVCS		
	RC-3, Boration via SIAS		
Maint. of Vital Aux. DC	MVA-DC-1, Batteries/Chargers	X	X
Maint. of Vital Aux. AC	MVA-AC-1, Startup Transformers		
	MVA-AC-2, EDG's	X	X
	MVA-AC-3, Unit Crosstie		
RCS Inventory Control	IC-1, CVCS		
	IC-2, Safety Injection	X	X
RCS Pressure Control	PC-1, Subcooled		X
	PC-2, PORV's/PZR Vent		
	PC-3, Saturated Control	X	
RCS & Core Heat	HR-1, S/G Without SIAS		
	HR-2, S/G With SIAS	X	X
	HR-3, Once Through Cooling		
Containment Isol	CI-1, Automatic/Manual Isol	X	X
Cntmt. Press & Temp	CTPC-1, Normal Cntmt Fans		
	CTPC-2, Cntmt Coolers		X
	CTPC-3, Cntmt Spray	O	
Cnmt. Comb Gas	CCGC-1 Hydrogen <3.5%	X	X
	CCGC-1 Hydrogen >3.5%		

Unit 1 is in 1-EOP-15 FUNCTIONAL RECOVERY. The above safety functions and success paths were evaluated over a period of 30 minutes. Based on the above, what success path instructions would be performed FIRST for Checkoff #1 and Checkoff #2?

A. 1) Maint. of Vital Aux. AC, success path MVA-AC-2, EDG's
2) Maint. of Vital Aux. AC, success path MVA-AC-2, EDG's

B. 1) Cntmt. Press & Temp, success path CTPC-3, Cntmt Spray
2) Reactivity Control, success path RC-1, CEA Insertion

C. 1) Reactivity Control, success path RC-1, CEA Insertion
2) Reactivity Control, success path RC-1, CEA Insertion

D. 1) Cntmt. Press & Temp, success path CTPC-3, Cntmt Spray
2) Maint. of Vital Aux. AC, success path MVA-AC-2, EDG's

Proposed Answer: D

Explanation (Optional):

A. Incorrect: Cntmt. Press & Temp, not met by ANY success path. Should be implemented first. Applicant may pick Maint. of Vital Aux. AC if applicant doesn't know the first safety function that is not met by ANY success path is the success path that should be implemented first.
B. Incorrect: part one correct, part two incorrect.
C. Incorrect: this safety function is met by success path 1, not to be implemented first.
D. Correct. CTPC-3 is success path that should be implemented to meet the safety function, checkoff 2 MVA-AC-2 EDG's is the success path that should be implemented.

Technical Reference(s): 1-EOP-15 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0702828-06 (As available)

Question Source: Bank # _____
Modified Bank # Last NRC Exam (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10
55.43 5

Comments:

Question 74

Unit 1 is in 1-EOP-15, "Functional Recovery," with the following Safety Function status:

SAFETY FUNCTION	SUCCESS PATH	
Reactivity control	RC-1 CEA Insertion	X
	RC-2 Boration via CVCS	
	RC-3 Boration via SIAS	
Maint. Of Vital Aux – DC	MVA – DC – 1 Batteries/Charger	X
Maint. Of Vital Aux – AC	MVA – AC – 1 Startup Transformers	
	MVA – AC – 2 EDG's	X
	MVA – AC – 3 Unit Crosstie	
RCS Inventory Control	IC – 1 CVCS	
	IC – 2 Safety Injection	O
RCS Pressure Control	PC - 1 Subcooled Controlled	
	PC – 2 PORV's / Pzr Vent	
	PC – 3 Saturated Control	X
RCS & Core Heat	HR – 1 S/G Without SIAS	
	HR – 2 S/G With SIAS	O
	HR – 3 Once Through Cooling	
Containment Isol	CI – 1 Automatic / Manual Isol	O
Cntmt Press & Temp	CTPC – 1 Normal Cntmt Fans	
	CTPC – 2 Cntmt Coolers	
	CTPC – 3 Cntmt Spray	X
Cntmt Comb Gas	CCGC – 1 Hydrogen <3.5%	X
	CCGC – 2 Hydrogen >3.5%	

O Not Met / X Met

What Success Path should be addressed first and the reason?

A. Implement MVA-AC-2, EDGs.
Reason: the EDG success path is evaluated to ensure power will be maintained to the equipment needed to support other safety functions.

B. Implement IC-2, Safety Injection.
Reason: without adequate RCS inventory, core cooling will be challenged.

C. Implement HR-2, S/G with SIAS:
Reason: RCS saturation margin needs to be maintained to ensure adequate core cooling.

D. Implement CI-1, Automatic / Manual Isol.
Reason: Containment integrity ensures release to the public is minimized.

4.0 OPERATOR INITIAL ACTIONS (continued)

INSTRUCTIONS	CONTINGENCY ACTIONS

* **12. Perform Success Path Instructions**

PERFORM **ALL** the following **IN THE ORDER LISTED:**

A. Instructions for a success path **MOST LIKELY** to be met for safety functions that are NOT met by **ANY** success path.

B. Instructions for success paths for safety functions that are NOT met by Success Path 1.

C. Instructions for **ALL** other success paths for safety functions met by Success Path 1.

* **13. Perform Long Term Actions**

When **ALL** Safety Function Status Check acceptance criteria are being satisfied,
Then PERFORM Long Term Actions.
REFER TO Section 4.10, Long Term Actions.

END OF INITIAL ACTIONS

ATTACHMENT 3
FUNCTIONAL RECOVERY SUCCESS PATHS
(Page 1 of 1)

Safety Functions	Success Paths	Checkoffs					
		1	2	3	4	5	6
Reactivity Control	RC-1, CEA Insertion						
	RC-2, Boration via CVCS						
	RC-3, Boration via SIAS						
Maint of Vital Aux - DC	MVA-DC-1, Batteries/Chargers						
Maint of Vital Aux - AC	MVA-AC-1, Startup Transformers						
	MVA-AC-2, EDGs						
	MVA-AC-3, Unit Crosstie						
RCS Inventory Control	IC-1, CVCS						
	IC-2, Safety Injection						
RCS Pressure Control	PC-1, Subcooled Control						
	PC-2, PORVs/Pzr Vent						
	PC-3, Saturated Control						
RCS & Core Heat	HR-1, S/G Without SIAS						
	HR-2, S/G With SIAS						
	HR-3, Once Through Cooling						
Containment Isol	CI-1, Automatic/Manual Isol						
Cntmt Press & Temp	CTPC-1, Normal Cntmt Fans						
	CTPC-2, Cntmt Coolers						
	CTCP-3, Cntmt Spray						
Cntmt Comb Gas	CCGC-1, Hydrogen <3.5%						
	CCGC-2, Hydrogen >3.5%						

END OF ATTACHMENT 3

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	G2.4.30	
	Importance Rating		4.1

Emergency Procedures/Plans: Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.

Proposed Question: SRO 100

Which ONE of the following events is required to be reported and who are the agencies that will be notified?

A. Two dead raccoons with apparent rabies have been discovered within the protected area. Notify Florida Fish and Wildlife Conservation Commission.

B. Loss of 50% of the backup notification method used to notify the State and NRC. Notify State Watch Office and the NRC.

C. A Tornado is sighted in the Met Tower parking lot area. Notify State Watch Office and the NRC.

D. A major automobile accident has blocked A1A south of the plant prohibiting southbound evacuation of the site, if needed. Notify State Watch Office and the NRC.

Proposed Answer: C

Explanation (Optional):

A. Incorrect: There are reporting requirements for bird kill and fish kills as a result of plant operation but not minor kill of animal life due to natural causes.
B. Incorrect: Reporting requirement is loss of all primary and backup communication methods.
C. Correct: Met tower is not in the power block but is in the owner controlled area North of Unit 1. This is classified as Unusual Event. EPIP will require notification of NRC and SWO.
D. Incorrect: Reporting required if the island was not able to be evacuated from North AND South routes.

Technical Reference(s): EPIP-01 Classification of Emergencies (Attach if not previously provided)

Proposed references to be provided to applicants during examination: _____

Learning Objective: 0902702-02 Classification of Emergencies. (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 10
55.43 5

Comments:

ATTACHMENT 1
EMERGENCY CLASSIFICATION TABLE
(Page 13 of 21)

EVENT/CLASS	UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
12. TORNADO	**A.** Notification of a tornado sighted in the Owner Controlled Area	**B.** §2 Any tornado striking the Power Block.		**NOTE** Refer to Potential Core Melt Event / Class 14.
13. ABNORMAL WATER LEVEL	**A.** Abnormal water level conditions are expected or occurring • Low intake canal level of -10.5 ft. MLW for 1 hour or more. OR • Visual sightings by station personnel that water levels are approaching storm drain system capacity.	**B.** Flood, low water, hurricane surge or other abnormal water level conditions • The storm drain capacity is exceeded during hurricane surge or known flood conditions. OR • Low intake canal level of -10.5 ft. MLW for 1 hour or more with emergency barrier valves open.	**C.** Flood, low water, hurricane surge or other abnormal water level conditions causing failure of vital equipment • Flood/surge water level reaching elevation +19.5 ft. (turbine building / RAB ground floor). OR • Low intake canal level has caused the loss of all ICW flow.	

12. TORNADO

13. ABNORMAL WATER LEVEL

AFTER CLASSIFYING, GO TO EPIP-02, DUTIES AND RESPONSIBILITIES OF THE EMERGENCY COORDINATOR

8.12 (continued)

Upon notification that the 12 month cumulative running siren availability decreased to less than 90 percent, or the siren availability during any 2 week period is determined to be less than 75 percent, a NRC notification will be made as a major loss of communication capability.

The loss of all primary and backup communication channels to a state or local government agency or emergency response facility [Control Room, Technical Support Center (TSC), Operational Support Center (OSC), Emergency Operations Facility (EOF)] meets the EPIP-01 requirements for the declaration of an unusual event. The communication channels include dedicated telephone communication links (i.e., Florida State Watch Office), commercial telephone lines, and offsite emergency radio communication system.

If a dedicated NRC primary communication channel is lost (i.e., either the ENS, HPN, or ERDS data link hardware (modem or phone line) for any amount of time, then the event is considered to be a major loss of emergency communication capability.

In addition to the off-site communications above, the total loss of the in-plant paging, and in-plant radio systems required for safe plant operation would be reportable as a major loss of emergency communication capability.

/R65A

1.1 Discussion (continued)

7. (continued)

NOTE

The State Department of Health (Bureau of Radiation Control) may not have their office staffed on a 24-hour basis. In the event that they do not answer the Hot Ring Down (HRD) telephone, the State Watch Office (SWO) assumes responsibility for notifying their duty officer. However, the EC/RM shall verify that the Bureau of Radiation Control has been notified.

B. Who Shall Be Notified

- State Division of Emergency Management
- State Department of Health (Bureau of Radiation Control)
- St. Lucie County Emergency Operations Center
- Martin County Emergency Operations Center
- NRC

1. State and County Notification

a. State and local agencies are notified by using the Hot Ring Down (HRD) telephone. The HRD rings the State Watch Office (SWO). The SWO puts the other agencies on line and reduces the need for individual calls.

2. NRC Notification

a. The NRC is notified using the Emergency Notification System (ENS) telephone.

b. NRC notifications occur through an open line of communication in the TSC and, when operational, the EOF.

APPENDIX A
SPECIFIC CONDITIONS OF THE UNIT 1 EPP
(Page 5 of 13)

4. §1,3 Environmental Conditions

A. Unusual or Important Environmental Events

1. Any occurrence of an unusual or important event that indicates or could result in significant environmental impact causally related to station operation shall be recorded and promptly reported to the NRC Operations Center within 72 hours via Emergency Notification System described in 10 CFR 50.72 for environmental protection issues. In addition, the reporting requirement time frame shall be consistent with 10 CFR 50.72 for environmental protection issues. The initial report shall be followed by a written report as described in Section 5.D.2. No routine monitoring programs are required to implement this condition. Events covered by Section 3.B of this Appendix will be subject to reporting requirements as defined in that section and not subject to these requirements.

2. The following are examples of unusual or important events: excessive bird impaction events; onsite plant or animal disease outbreaks; mortality (causally related to station operation), or unusual occurrence of any species protected by the Endangered Species Act of 1973; unusual fish kills; increase in nuisance organisms or conditions; and unanticipated or emergency discharges of waste water or chemical substances.

B. Terrestrial / Aquatic Issues

The certifications and permits required under the Clean Water Act provide mechanisms for protecting water quality and indirectly, aquatic biota. The NRC will rely on the decisions made by the State of Florida under the authority of the Clean Water Act and, in the case of sea turtles, decisions made by the NMFS under the authority of the Endangered Species Act, for any requirements pertaining to terrestrial and aquatic monitoring.