



**FPL**

**Florida Power & Light St Lucie  
HLC-18 NRC Examination  
July 2008  
Senior Reactor Operator**

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	EA2.1	_____
	Importance Rating	_____	3.7

E02 / Reactor Trip Recovery / 1 Facility Conditions and selection of appropriate procedures during abnormal and emergency operations.

Proposed Question: SRO 76

Unit 1 tripped from 50% power. The following conditions exist during EOP-01:

- CEA 56 not fully inserted.
- 1A3 4.16 KV bus not energized with 1A EDG running. 1B3 4.16 KV bus energized from SU transformer.
- RCS subcooling indicates 35<sup>0</sup>F.
- 1A Main Feedwater pump was out of service prior to the trip.
- 1C AFW Pump was out of service prior to the trip.

Which one of the following ADDITIONAL condition would result in implementing a subsequent EOP OTHER THAN EOP-02?

- A. CEA 62 not fully inserted
- B. 1B Main Feedwater pump trips
- C. RCS subcooling lowers to 18<sup>0</sup>F
- D. A stuck open SBCS valve resulted in SG pressure lowering to 830 psig before being closed.

Proposed Answer: C

Explanation (Optional):

- A. Emergency boration will meet Reactivity control
- B. AFW is available
- C. Correct, <20<sup>0</sup>F subcooled requires tripping all RCP's. This will result in entering 2-EOP-09 Loss of Forced Circulation / LOOP
- D. MSIS setpoint not reached

Technical Reference(s): 2-EOP-01 Standard Post trip (Attach if not previously provided)  
Actions

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702822-10 (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:

52076

REVISION NO.: 25	PROCEDURE TITLE: STANDARD POST TRIP ACTIONS	PAGE: 9 of 17
PROCEDURE NO.: 2-EOP-01	ST. LUCIE UNIT 2	

4.0 OPERATOR ACTIONS (continued)

### RCS PRESSURE CONTROL

#### INSTRUCTIONS

#### CONTINGENCY ACTIONS

4. DETERMINE RCS Pressure Control acceptance criteria are met:

A. VERIFY Pressurizer pressure is between 1800 and 2300 psia.

A.1 If Pressurizer pressure is less than 2300 psia, and the PORV(s) are OPEN, Then PERFORM **ANY** of the following:

1. OVERRIDE the open PORV(s).
2. CLOSE the associated PORV block valve(s).

A.2 If Pressurizer pressure is less than 1736 psia, Then ENSURE **ALL** of the following:

1. SIAS has ACTUATED.
2. CIAS has ACTUATED.
3. **ONE** RCP in **EACH** loop is stopped.

B. VERIFY Pressurizer pressure is trending to between 2225 and 2275 psia.

B.1 RESTORE and MAINTAIN Pressurizer pressure between 2225 and 2275 psia by performing **ANY** of the following:

1. ENSURE proper operation of the Pressurizer Pressure Control System.
2. Manually OPERATE heaters and spray.

C. VERIFY RCS subcooling is at least 20°F.

C.1 If RCS subcooling is less than 20°F or RCP(s) exhibit cavitation, Then STOP **ALL** RCPs.

REVISION NO.: 15	PROCEDURE TITLE: LOSS OF OFFSITE POWER/LOSS OF FORCED CIRCULATION ST. LUCIE UNIT 2	PAGE: 4 of 27
PROCEDURE NO.: 2-EOP-09		

## 2.0 ENTRY CONDITIONS

2.1 **BOTH** of the following conditions exist,

1. **ANY** of the following have occurred:

- 2-EOP-01, Standard Post Trip Actions, have been performed
- The event initiated from Mode 3  
and SIAS has NOT been blocked
- A Station Blackout (SBO) event has occurred  
and at least **ONE** Vital 4.16 KV bus has power restored from a Unit 2 source

2. Plant conditions indicate that a LOOP/LOFC has occurred;  
**ANY** of the following may be present:

- Transformer alarms
- Breaker alarms
- EDGs automatically starting
- RCP trouble alarms
- Condenser vacuum alarms
- Low RCS flow indications

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>1</u>
	Group #	_____	<u>1</u>
	K/A #	<u>2.4.6</u>	_____
	Importance Rating	_____	<u>4.7</u>

000011 / Large Break LOCA / 3 Emergency Procedures / Knowledge of EOP mitigation strategies.

Proposed Question: SRO 77

Unit 2 is implementing 2-EOP-03 LOCA with the following conditions:

- Pressurizer pressure 650 psia
- RCS temperature is 440°F
- Containment temperature is 205°F

Based on the above conditions, what is the required action?

- A. Depressurize the RCS to maximize Safety Injection Flow
- B. Commence a cooldown at 50°F / hour
- C. Depressurize the RCS to < 350 psia to establish shutdown cooling
- D. Commence a cooldown at 100°F / hour

Proposed Answer: D

Explanation (Optional):

- A. Lack of subcooling prohibits further RCS depressurization
- B. Correct for no RCP's operating with subcooling established
- C. Lack of subcooling prohibits further RCS depressurization
- D. Correct Answer: Rate for loss of subcooling (use Fig 1B)

Technical Reference(s): 2-EOP-03 Step 68 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: 2-EOP-99 Fig. 1A & 1B

Learning Objective: LOCA Event 0702824-11 (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 \_\_\_\_\_  
55.43  5

Comments: RCP will not be operating due to not meeting Figure 1B for subcooling. Cooldown limited to 50°F / hour.

5/10/77

REVISION NO.: 25	PROCEDURE TITLE: LOSS OF COOLANT ACCIDENT	PAGE: 48 of 72
PROCEDURE NO.: 2-EOP-03	ST. LUCIE UNIT 2	

4.0 OPERATOR ACTIONS (continued)

**INSTRUCTIONS**

**CONTINGENCY ACTIONS**

<b>NOTE</b>
Cooldown rates up to 100°F in any 1 hour period are permitted to regain or maintain minimum subcooling.

- 68. Cooldown the RCS (to SDC)**  
 COOLDOWN the RCS using SBCS.
  - A.** If RCPs are operating,  
Then COOLDOWN at a rate not to exceed 100°F in **ANY** 1 hour period.  
**REFER TO** 2-GOP-305, Reactor Plant Cooldown – Hot Standby to Cold Shutdown.
  - B.** If RCPs are NOT operating,  
Then COOLDOWN at a rate not to exceed 50°F in **ANY** 1 hour period.  
**REFER TO** ONP 2-0120039, Natural Circulation Cooldown.

- 68.1** COOLDOWN the RCS using ADVs.
- 68.2** COOLDOWN using 2C AFW Pump and alternate Steaming flow paths.  
**REFER TO** Table 12, Alternate S/G Heat Removal Paths.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	2.4.35	_____
	Importance Rating	_____	4.0

026 / Loss of Component Cooling Water / 8 Emergency Procedures / Plan: Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects

Proposed Question: SRO 78

Unit 1 has experienced a SGTR on the 1A SG with the following conditions:

- Mode 3, 1-EOP-04 has been implemented.
- A loss of Instrument air required all RCP's to be stopped.
- The effected SG has been isolated.
- It is desired to start the 1A1 RCP to facilitate cooling the effected SG.

- 1) Which of the following manipulations will restore CCW to the 1A1 RCP?
- 2) What is the effect if SIAS occurs?

- A. 1) Close the instrument air supply to HCV-14-1. Attach the nitrogen flex hose to the male disconnect fitting and verify the valve has opened.  
2) HCV-14-1 will close on SIAS.
- B. 1) Close the instrument air supply to HCV-14-1. Attach the nitrogen flex hose to the male disconnect fitting and verify the valve has opened.  
2) HCV-14-1 will NOT close on SIAS.
- C. 1) Close the solenoid vent valve on HCV-14-1. Attach the HCV solenoid vent line male flex hose to the female quick disconnect fitting. Verify the HCV has opened.  
2) HCV-14-1 will close on SIAS.
- D. 1) Close the solenoid vent valve on HCV-14-1. Attach the HCV solenoid vent line male flex hose to the female quick disconnect fitting. Verify the HCV has opened.  
2) HCV-14-1 will NOT close on SIAS.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Valve still closes on CIAS
- C. Wrong connection. This is for a solenoid failure on the air operated valve, also this configuration will NOT allow the valve to close on CIAS. Must declare valve OOS
- D. Wrong connection

Technical Reference(s): 1-NOP-01.02 Reactor Coolant Pump Operation step 7.3. (Attach if not previously provided)

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Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702209-6D (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:

REVISION NO.: 21	PROCEDURE TITLE: REACTOR COOLANT PUMP OPERATION	PAGE: 42 of 54
PROCEDURE NO.: 1-NOP-01.02	ST. LUCIE UNIT 1	

7.3 Local Restoration of CCW to RCPs PERF IV

**NOTE**

- All temporary hose connections must be documented in accordance with ADM-17.18, Temporary System Alteration.
- After movement of the position of the vent ball valves, operability of the containment isolation valves is required to be verified by ASME stroke testing in accordance with OP-1-0010125A when the valves are restored to normal configuration.

1. If loss of CCW is due to an air supply failure, Then perform the following local actions:

A. CLOSE the instrument air supply valve to the affected HCV(s). \_\_\_\_\_

HCV NUMBER	HCV-14-1	HCV-14-7	HCV-14-2	HCV-14-6
IA SUPPLY VLV NUMBER	V182123	V182126	V182124	V182125

B. ATTACH the nitrogen flex hose (female end, supplied at each HCV) to the male quick disconnect fitting in the air supply line to each HCV. \_\_\_\_\_

C. VERIFY the HCV has opened. \_\_\_\_\_

**CAUTION**

¶<sub>2</sub> Operation of the 3/8" solenoid vent ball valves affect the operability of the Containment Isolation valves HCV-14-1, 2, 6, and 7, resulting in Technical Specification actions, as the valves will NOT close during SIAS conditions and the stroke times of HCV-14-1, 2, 6, and 7 will be impacted. If the solenoid vent ball valves are operated, log entries in accordance with 0-NOP-100-01, Equipment Out of Service, and cognizance of Technical Specification actions are required.

2. If loss of CCW is due to a solenoid failure, Then perform the following local actions:

A. CLOSE the solenoid vent ball valve for the affected HCV. \_\_\_\_\_

HCV NUMBER	HCV-14-1	HCV-14-7	HCV-14-2	HCV-14-6
SOLENOID VENT BALL VLV NUMBER	T-SH14020	T-SH14023	T-SH14021	T-SH14022

B. ATTACH the HCV solenoid vent line male flex hose to the female quick disconnect fitting downstream of the air supply regulator. \_\_\_\_\_

C. VERIFY the HCV has opened. \_\_\_\_\_

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	EA2.01	
	Importance Rating		4.7

000038 / Steam Generator Tube Rupture / 3 Ability to determine or interpret the following as they apply to a SGTR: When to isolate one or more steam generator.

Proposed Question: SRO 79

Unit 1 has the following conditions:

- An ESDE has occurred on the 1A SG upstream of the MSIV's
- The RCS is cooling down at 110<sup>0</sup>F per hour as a result of the ESDE
- T<sub>hot</sub> is 520<sup>0</sup>F
- T<sub>cold</sub> is 512<sup>0</sup>F
- A SGTR has occurred on the 1B SG
- One RCP in each loop is operating
- 1-EOP-15 is being implemented

Which of the following strategy should be implemented?

- A. Isolate the 1A SG when T<sub>cold</sub> is <510<sup>0</sup>F.
- B. Isolate the 1A SG when T<sub>hot</sub> is <510<sup>0</sup>F.
- C. Isolate the 1B SG when T<sub>cold</sub> is <510<sup>0</sup>F.
- D. Isolate the 1B SG when T<sub>hot</sub> is <510<sup>0</sup>F.

Proposed Answer: B

Explanation (Optional):

- A. Should be T<sub>hot</sub> not T<sub>cold</sub>
- B. Correct
- C. Wrong SG to be isolated and wrong temperature
- D. Wrong SG to be isolated

Technical Reference(s): 1-EOP-15 page 97 step 4.6.14 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702828-7A (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:

SRO 79

REVISION NO.: 27	PROCEDURE TITLE: FUNCTIONAL RECOVERY	PAGE: 97 of 205
PROCEDURE NO.: 1-EOP-15	ST. LUCIE UNIT 1	

**4.6 RCS and CORE HEAT REMOVAL – HR-2 (continued)**

**Success Path 2 –S/G With SIAS (continued)**

**INSTRUCTIONS**

**CONTINGENCY ACTIONS**

**NOTE**  
Cooldown rates up to 100°F in **ANY** 1 hour period are permitted to regain or maintain minimum subcooling.

**14. Cooldown RCS**

If indication of a LOCA or SGTR exists,  
Then PERFORM the following:

- A.** COOLDOWN the RCS using SBCS.
  - 1. If RCPs are operating,  
Then COOLDOWN not to exceed 100°F in **ANY** 1 hour period.
  - 2. If RCPs are NOT operating,  
Then COOLDOWN not to exceed 50°F in **ANY** 1 hour period.
  - 3. If RCPs are NOT operating,  
and a S/G is ISOLATED for a SGTR event,  
Then COOLDOWN not to exceed 30°F in **ANY** 1 hour period.
- B.** BORATE the RCS until Shutdown Margin is greater than the value required by the COLR.  
**REFER TO** 1-NOP-02.24, Boron Concentration Control.

- A.1** COOLDOWN using ADVs.
- A.2** If local operation of ADVs is required,  
Then **REFER TO** Appendix U, Local Operation of Unit 1 Atmospheric Dump Valves.
- A.3** COOLDOWN using alternate steaming paths.  
**REFER TO** Table 12, Alternate S/G Heat Removal Paths.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	2.1.20	_____
	Importance Rating	_____	4.6

000058 / Loss of DC Bus / 6 Conduct of Operations: Ability to interpret and execute procedure steps.

Proposed Question: SRO 80

Unit 1 is in Mode 3 performing a plant startup after refueling. The startup is on hold due to 1A EDG being declared out of service one hour ago. The following conditions exist:

- RCS pressure is 1510 psia.
- RCS temperature is 498°F
- 1A1, 1A2 and 1B2 RCP's are running.

A loss of the 1B DC bus occurs. Which of the following states the procedural implementation order for the stated conditions?

- Perform safety functions for 1-ONP-01.01 PC-1 "SG Heat Removal LTOP NOT in Effect" THEN implement 1-0030136 Loss of A Safety Related DC Bus.
- Implement ONLY 1-0030136 Loss of A Safety Related DC Bus
- Implement 1-0030136 Loss of A Safety Related DC Bus THEN perform safety functions for 1-ONP-01.01 PC-1 SG Heat Removal LTOP NOT in Effect.
- Implement ONLY 1-ONP-01.01 PC-1 SG Heat Removal LTOP NOT in Effect.

Proposed Answer: C

Explanation (Optional):

- Reverse of the correct answer
- Partially correct
- Correct
- Partially correct

Technical Reference(s): 1-0030136 Loss of A Safety Related DC Bus (Attach if not previously provided)

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1-ONP-01.01 Plant Condition 1  
Steam Generator Heat Removal  
LTOP Not in Effect

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Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702813-1 (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:

52080

REVISION NO.: 14C	PROCEDURE TITLE: LOSS OF A SAFETY RELATED D.C. BUS	PAGE: 7 of 20
PROCEDURE NO.: 1-0030136	ST. LUCIE UNIT 1	

7.2 Subsequent Actions (continued)

**INSTRUCTIONS**

**CONTINGENCY ACTIONS**

2. (continued)

F.  $\Psi$  When the DC bus has been reenergized, Then:

1.  $\uparrow$  Realign AC power per Appendix B, AC Bus Restoration.
2.  $\uparrow$  Reset Safeguard signals and restore plant equipment to normal alignment per Appendix C, Restoration of Components Actuated by SIAS and CIAS.

3. Actions When in Mode 3 Through Mode 6 (SIAS Blocked)

**NOTE**

- If conditions continue to degrade or this procedure is NOT succeeding in stabilizing plant conditions, Then the Low Mode Off-Normal Procedure (LMONP) for the current plant condition should be implemented.
- Loss of Safety Related 1A DC Bus will cause V3306, SDC Bypass to fail open. Loss of Safety Related 1B DC Bus will cause V3657, SDC Temp. Control Valve to fail closed.

A. If Shutdown Cooling was in service, Then:

1. Consider locally placing FCV-3306, LPSI Pumps Disch Hdr Flow, or HCV-3657, SDC Hx Outlet Cross-Tie to LPSI Pump Disch Hdr, on handjack.
2. Refer to ONOP 1-0440030, Shutdown Cooling, for guidance in restoring shutdown cooling.

SRO 80

REVISION NO.: 14C	PROCEDURE TITLE: LOSS OF A SAFETY RELATED D.C. BUS	PAGE: 8 of 20
PROCEDURE NO.: 1-0030136	ST. LUCIE UNIT 1	

7.2 Subsequent Actions (continued)

**INSTRUCTIONS**

**CONTINGENCY ACTIONS**

3. (continued)

- B. If steam bypass valves or ADVs are required for heat removal, Then consider local control of valves as needed to stabilize RCS temperature.
- C. Perform safety function status check per Low Mode Off-Normal Operating Procedure, Appendix A, for the current plant condition.
- D. Implement E-Plan as necessary.
- E. If the Diesel Generator was loaded on the affected side prior to the loss of the bus and is NOT necessary for plant operation, Then locally trip the Diesel Generator output breaker(s) 1-20211 (1-20401).
- F. Monitor redundant plant instrumentation and stabilize RCS until the affected DC bus has been restored.

**NOTE**  
Due to the loss of DC control power, all breakers on the affected side will require manual operation.

- G. Ψ Restore power to the affected DC bus per Appendix A, DC Bus Restoration.

REVISION NO.: 19A	PROCEDURE TITLE: PLANT CONDITION 1 STEAM GENERATOR HEAT REMOVAL LTOP NOT IN EFFECT ST. LUCIE UNIT 1	PAGE: 5 of 166
PROCEDURE NO.: 1-ONP-01.01		

**3.10** ¶7 CR 01-0714, SDC 1A Relief Valve Lift

**3.11** PCM 04059, Feedwater Control Replacement - Phase 2

**4.0** RECORDS REQUIRED

**4.1** Normal log entries.

**5.0** ENTRY CONDITIONS

1. An Emergency Operating Procedure is NOT currently in use.

AND

2. An Emergency Operating Procedure is NOT exited directly to this procedure.

AND

3. Any of the following conditions exist.

- A. Shift Supervisor directs that LMONP be entered.
- B. LMONP Safety Function Status Checks for the current plant conditions are NOT being met.
- C. Off-Normal Operating Procedure NOT adequately mitigating the event.
- D. Any condition, or pattern of symptoms, with no immediately apparent diagnosis or cause OR for which off-normal guidance can NOT be identified.

REVISION NO.: 19A	PROCEDURE TITLE: PLANT CONDITION 1 STEAM GENERATOR HEAT REMOVAL LTOP NOT IN EFFECT ST. LUCIE UNIT 1	PAGE: 6 of 166
PROCEDURE NO.: 1-ONP-01.01		

**6.0 EXIT CONDITIONS**

1. Appropriate acceptance criteria are met as indicated by either of the following conditions:

- A. The plant meets safety function acceptance criteria for the original plant condition prior to the event:

1. Plant parameters still meet the definition of the original plant condition.
2. The safety function acceptance criteria for the original plant condition prior to the event are being satisfied.

OR

- B. The plant has changed such that a new plant condition is applicable:

1. The plant meets the definition of a plant condition other than the original plant condition.
2. The safety function acceptance criteria for this plant condition are being satisfied.

AND

2. An appropriate, approved procedure to perform exists or has been approved by the Plant Technical Support Center.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	AA2.06	_____
	Importance Rating	4.2	_____

000065 / Loss of Instrument Air / 8 Ability to determine and interpret the following as they apply to the Loss of Instrument Air: When to trip reactor if instrument air pressure is de-creasing

Proposed Question: SRO 81

Unit 1 is currently at 82% power. A downpower is in progress to remove the 1A MFW pump form service.

Which of the following plant conditions would require you to direct an IMMEDIATE manual trip of the reactor?

- A. Instrument air pressure is currently 59 psig and lowering.
- B. 1A and 1B SG levels are 75% and increasing.
- C. BOTH heater drain pumps trip.
- D. 4.16 KV bus 1B3 de-energizes due to an electrical fault on the bus.

Proposed Answer: D

Explanation (Optional):

- A. Correct. Immediate operator actions to trip at <60 psig air pressure
- B. Immediate manual trip required at 80%
- C. CCW flow will lower as air pressure is lost and valve slowly closing
- D. This event does not require immediate manual trip

Technical Reference(s): 1-1010030 Loss of Instrument Air, Step 7.1.1 Immediate Operator Actions (Attach if not previously provided)

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Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702860-6 (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:

REVISION NO.: 32A	PROCEDURE TITLE: LOSS OF INSTRUMENT AIR	PAGE: 5 of 21
PROCEDURE NO.: 1-1010030	ST. LUCIE UNIT 1	

**7.0 OPERATOR ACTIONS**

**7.1 Immediate Operator Actions**

**INSTRUCTIONS**

**CONTINGENCY ACTIONS**

**NOTE**

A Instrument Air header high pressure condition will lock out the standby instrument air compressor (1C or 1D) from automatic start. Manual actions to reset the standby compressor (1C or 1D) must be taken after the high pressure condition is clear. The following indicators in the local panel are available for diagnosing the compressor status:

- A red light indicates the unit has tripped.
- An amber light indicates that the tripping condition has cleared.

1. If the Instrument Air header pressure indicates less than 60 psig and is still lowering, Then PERFORM the following:

- A. TRIP the Reactor and Turbine.
- B. **GO TO 1-EOP-01, Standard Post Trip Actions.**

2. If a high pressure condition in the Instrument Air header exists, Then PERFORM the following:

- A. CHECK the running instrument air compressor (1C or 1D) for proper operation.
- B. If the running instrument air compressor (1C or 1D) is NOT unloading, Then TRIP / STOP the malfunctioning instrument compressor at the local control panel.
- C. At the standby instrument air compressor (1C or 1D) local control panel, When the header high pressure condition is clear, Then ENSURE the amber light in the panel is lit and PRESS the RESET pushbutton.
- D. Manually START the standby instrument air compressor (1C or 1D).

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	2
	K/A #	AA2.05	_____
	Importance Rating	_____	3.9

000024 / Emergency Boration / 1 Ability to determine and interpret the following as they apply to the Emergency Boration: Amount of boron to add to achieve required SDM.

Proposed Question: SRO 82

Unit 2 has evacuated the Control Room and has implemented 1-ONP-100.02 Control Room Inaccessibility. An RCS cooldown is to be performed. As the Unit Supervisor, you have reported to the Hot Shutdown Panel to assist the RCO as directed Appendix C.

Given that 2A BAMT is 97% at 5199 PPM, which of the following is the MINIMUM boric acid that should be added to ensure adequate Shutdown Margin during the cooldown?

- A. 3000 gallons
- B. 6700 gallons
- C. 7000 gallons
- D. 7400 gallons

Proposed Answer: B

Explanation (Optional):

- A. If read graph backwards from 97% to bottom of acceptable range
- B. Correct
- C. If used wrong PPM
- D. If used wrong PPM

Technical Reference(s): 2-ONP-100.02 Figure 8 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: 2-ONP-100.02 Figure 8

Learning Objective: 0702864-9 (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:

REVISION NO.: 17A	PROCEDURE TITLE: CONTROL ROOM INACCESSIBILITY	PAGE: 44 of 86
PROCEDURE NO.: 2-ONP-100.02	ST. LUCIE UNIT 2	

**APPENDIX E**  
**PLANT COOLDOWN & SHUTDOWN COOLING OPERATION**  
(Page 2 of 10)

INITIAL

**CAUTION**

- BOTH 2A and 2B BAMT level indications may NOT be reliable.
- BAM tanks contain approximately 99 gallons per %.
- BAM tank usage must be closely monitored to prevent gas binding of the charging pump.
- The charging pump low suction pressure trip is removed from the trip circuit when the charging pump NORMAL / ISOLATE switch is in ISOLATE.

**NOTE**

- Cooldown and Boration are performed simultaneously.
- Continue with this appendix while borating and cooling down.
- Perform Step 3 when the required BAMT volume has been injected.

3. When an amount greater than the minimum required Technical Specifications volume, in accordance with Figure 3.1-1, St. Lucie 2 Min BAMT (attached), has been injected into the RCS from the BAM tank(s), Then ALIGN the RWT for makeup as follows:

- A. STOP ALL Charging Pumps.
- B. POSITION the following components as indicated:

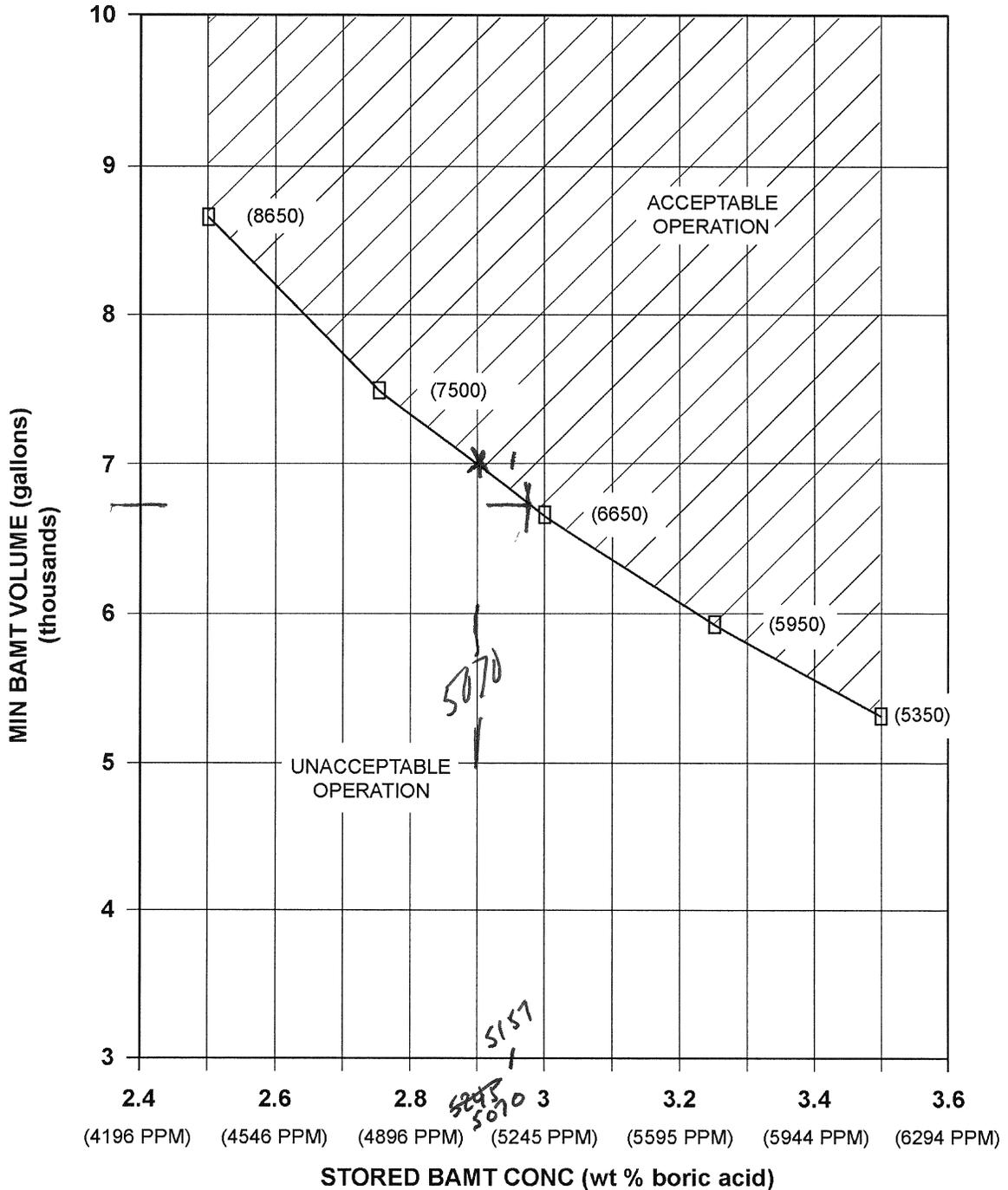
COMPONENT ID	COMPONENT NAME	POSITION	PERF INITIAL
V2504	RWT to Chg Pump Suction	OPEN	
V2508	1B BAMT Outlet to Gravity Feed MOV	CLOSED	
V2509	1A BAMT Outlet to Gravity Feed MOV	CLOSED	

- C. OPERATE the available Charging Pump(s) as required to maintain Pressurizer level 30 to 70%.

51082

REVISION NO.: 17A	PROCEDURE TITLE: CONTROL ROOM INACCESSIBILITY	PAGE: 83 of 86
PROCEDURE NO.: 2-ONP-100.02	ST. LUCIE UNIT 2	<b>2</b>

**FIGURE 8**  
**FIGURE 3.1-1 - ST. LUCIE 2 MIN BAMT VOLUME VS STORED BAMT**  
**CONCENTRATION**  
(Page 1 of 1)



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>1</u>
	Group #	_____	<u>2</u>
	K/A #	AA2.01	_____
	Importance Rating	_____	<u>3.2</u>

000036 / Fuel Handling Accident / 8 Ability to determine and interpret the following as they apply to the Fuel Handling Incidents:  
ARM system indications. .

Proposed Question: SRO 83

Unit 2 is in Mode 6 with Fuel movement occurring in the Containment. The refueling machine is lowering a spent fuel element over the upender when a cable slack light appears about half way into the upender.

Shortly afterward the following indications are observed on the PC-11 in the Control Room

- RC-26-3 CIS indicates MAGENTA
- RC-26-4 CIS indicates RED
- RC-26-5 CIS indicates YELLOW
- RC-26-6 CIS indicates RED

1) Which of the following states the status of CIAS shortly after the fuel element dropped?

2) What direction will the Unit Supervisor give?

- A. 1) CIAS has NOT actuated.  
2) Contact Chemistry to initiate a Continuous Containment purge
- B. 1) CIAS has NOT actuated.  
2) Direct HVE-8A and HVE-8B Containment Purge fans stopped
- C. 1) CIAS actuated  
2) Ensure Containment Evacuation alarmed and evacuate the Containment.
- D. 1) CIAS actuated  
2) Ensure Containment Evacuated AND direct closure of BOTH Containment air lock doors

Proposed Answer: C

Explanation (Optional):

- A. CIAS has actuated as indicated by two of four channels in RED
- B. CIAS has actuated as indicated by two of four channels in RED Part 2 correct
- C. Correct
- D. BOTH doors not required to be closed

Technical Reference(s): 2-1600030 Accidents Involving New or Spent Fuel (Attach if not previously provided)  
 2-ONP-26.02 Area Radiation Monitors  
 \_\_\_\_\_  
 \_\_\_\_\_

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702861-4 (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:

REVISION NO.: 10A	PROCEDURE TITLE: ACCIDENTS INVOLVING NEW OR SPENT FUEL	PAGE: 5 of 10
PROCEDURE NO.: 2-1600030	ST. LUCIE UNIT 2	

**7.0 OPERATOR ACTIONS**

**7.1 Immediate Operator Actions**

**INSTRUCTIONS**

**CONTINGENCY ACTIONS**

1. Notify control room personnel of the accident.

<b>NOTE</b>
<ul style="list-style-type: none"> <li>• If damage to spent fuel occurred inside containment, a Containment Isolation Actuation Signal (CIAS) may occur.</li> <li>• If damage to spent fuel occurred in the Fuel Handling Building, a high radiation signal may alarm in the control room which will isolate the Fuel Handling Building and activate the Shield Building Ventilation System.</li> </ul>

2. If the accident occurred inside the Containment, Then:
  - A. Sound the Containment Evacuation alarm.
  - B. Evacuate the Containment.
  - C. Notify Health Physics to check personnel for contamination.

<b>NOTE</b>
The alpha radiation hazard associated with a damaged new fuel assembly will NOT cause actuation of the Area or Process Radiation Monitor high radiation alarms. Additionally, if the SBVS has actuated, effluent will be monitored through the <u>plant stack Effluent Monitoring System</u> .

3. If the accident occurred in the Fuel Pool area, Then:
  - A. Evacuate the Fuel Pool area and remain on the landing outside the door.
  - B. Notify Health Physics to check personnel for contamination.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	2
	K/A #	2.2.37	_____
	Importance Rating	_____	4.6

000067 / Plant Fire Onsite / Ability to determine operability and / or availability of safety related equipment.

Proposed Question: SRO 84

Unit 1 Fire Zone 6 (Automatic Sprinklers) for 1A Diesel Generator building has to be removed from service due to unplanned impairment (severely rusted / leaking piping system). Estimated repair time is 42 hours. Which of the following describes the necessary compensatory actions required and the proper notification requirements?

- A. Establish a continuous fire watch with backup fire suppression equipment within 4 hours. Notify Risk Management if impairment exceeds 48 hours.
- B. Establish continuous fire watch with backup fire suppression equipment within 1 hour. Notify Risk Management as soon as possible.
- C. Declare the 1A Diesel Generator out of service as soon as Fire Zone 6 isolated. Establish backup fire suppression equipment within 1 hour. Notify Risk management as soon as possible.
- D. Declare the 1A Diesel Generator out of service if automatic sprinkler system out of service greater than 48 hours. Notify Risk Management if impairment exceeds 48 hours.

Proposed Answer: B

Explanation (Optional):

- A. One hour requirement
- B. Correct
- C. Does not require Diesel to be placed out of service with compensatory actions taken
- D. Does not require Diesel to be placed out of service with compensatory actions taken

Technical Reference(s): 1800022 Fire Protection Plan (Attach if not previously provided)  
0010239 Fire Protection System Impairment  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0802830-1 (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:

REVISION NO.: 14C	PROCEDURE TITLE: FIRE PROTECTION SYSTEM IMPAIRMENT	PAGE: 10 of 11
PROCEDURE NO.: 0010239	ST. LUCIE PLANT	

**8.4** Emergency or Unplanned Impairments

1. An individual discovering an impairment to the fire protection system shall report it immediately to the Control Room.
2. The SM / US shall promptly initiate actions to:
  - A. Provide temporary protection for the areas affected.
  - B. Isolate affected equipment, as necessary.
  - C. Review the Fire Protection Plan for applicable actions.
  - D. As required, notify maintenance to make necessary repairs.
  - E. Notify the Plant Fire Supervisor and Risk Management concerning fire system impairment (See 7.1 and 7.2).
3. The cognizant maintenance supervisor shall direct repairs such that the fire system is repaired and returned to operable status as soon as possible. The maintenance supervisor shall also coordinate with the SM / US and QC as necessary to achieve the above stated goal.

REVISION NO.: 41C	PROCEDURE TITLE: FIRE PROTECTION PLAN	PAGE: 70 of 101
PROCEDURE NO.: 1800022	ST. LUCIE PLANT	

**APPENDIX A**  
**FIRE PROTECTION FEATURES OPERABILITY REQUIREMENTS AND**  
**COMPENSATORY MEASURES**

(Page 12 of 32)

**2.5** Water Supply Surveillance Requirements

1. (continued)

**G.** §<sub>1</sub> At least once per 3 years by performing a flow test of the system in accordance with Chapter 5, Section 11 of the Fire Protection Handbook, 14th Edition, published by the National Fire Protection association.

2. Surveillances which are required for OTHER SYSTEMS fire water supply are listed in Appendix B.

**3.0** Automatic Fire Suppression Systems

**3.1** **Required Systems** Fire Suppression Systems

1. Automatic Sprinklers

**A.** Unit 1 Fire Zone 6 - Diesel Generator Building 1A

**B.** Unit 1 Fire Zone 7 - Diesel Generator Building 1B

**C.** Unit 1 RAB Sprinkler System - Fire Zones 36, 44, 44A, 44B, 47, 55E & 55W

**D.** Unit 1 RAB East Stairway Sprinklers - Fire Zones 36 & 55E

**E.** Unit 2 Fire Zone 8 - Diesel Generator Building 2A

**F.** Unit 2 Fire Zone 9 - Diesel Generator Building 2B

**G.** Unit 2 Fire Zone 19 - RAB El. -.050' East Hallway and Miscellaneous Equipment Areas

**H.** Unit 2 Fire Zone 20 - RAB El. -0.50' East-West Common Hallway

**I.** Unit 2 Fire Zone 22 - RAB El. 19.50' Electrical Penetration Room A

**J.** Unit 2 Fire Zone 23 - RAB El. 19.50' Electrical Penetration Room B

REVISION NO.: 41C	PROCEDURE TITLE: FIRE PROTECTION PLAN	PAGE: 73 of 101
PROCEDURE NO.: 1800022	ST. LUCIE PLANT	

**APPENDIX A**  
**FIRE PROTECTION FEATURES OPERABILITY REQUIREMENTS AND**  
**COMPENSATORY MEASURES**

(Page 15 of 32)

**3.2 Other Systems Fire Suppression Systems (continued)**

2. (continued)

G. Unit 2 Auxiliary Transformers 2A & 2B

H. Unit 2 Startup Transformer 2A & 2B

I. Unit 2 Turbine Lube Oil Reservoir

J. Unit 2 Hydrogen Seal Oil Unit

3. Halon Fire Suppression Systems

**3.3 Fire Suppression Systems Operability Requirements**

The REQUIRED SYSTEMS fire suppression systems shall be OPERABLE whenever equipment protected by those systems is required to be OPERABLE.

**3.4 Fire Suppression Systems Compensatory Measures**

1. With any of the REQUIRED SYSTEMS fire suppression systems inoperable, within 1 hour establish a continuous fire watch with backup fire suppression equipment for those areas in which redundant Appendix R Safe Shutdown Train-related systems or components could be damaged; for other areas, establish an hourly fire watch patrol.

2. With one or more of the OTHER SYSTEMS fire suppression systems inoperable, contact the Fire Protection Supervisor for the required compensatory measures and return the fire suppression system to service as soon as possible.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	2
	K/A #	AA2.02	_____
	Importance Rating	_____	4.4

000069 / Loss of Containment Integrity / 5 Ability to determine and interpret the following as they apply to the Loss of Containment Integrity: Verification of automatic and manual means of restoring integrity.

Proposed Question: SRO 85

A containment penetration that is normally closed, must be opened to facilitate repairs in the Containment while Unit 2 is in Mode 4.

Which of the following is an acceptable means to comply with Technical Specifications during these repairs?

- A. Designate an Operator with constant communications to the Control Room, to close the penetration within 30 minutes of notification.
- B. Station an Operator at the penetration with constant communications to the Control Room, to close the penetration in an accident situation.
- C. Station an Operator in the Containment with instructions to secure all repair work and evacuate the Containment in an accident situation.
- D. Complete the repairs and close the penetration within 6 hours or place the Unit in Mode 5 within the next 6 hours.

Proposed Answer: B

Explanation (Optional):

- A. Operator must be at the location in a safe environment.
- B. Correct
- C. Penetration must be capable of being closed
- D. Time limit not applicable

Technical Reference(s): Ops-503 Technical Specification Guidance (Attach if not previously provided)  
T.S. Bases Attachment 8 of ADM-25.04

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Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL NLI OPS ADM 703-1A (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:

SK085



<b>ST. LUCIE PLANT</b>	OPS-503
<b>OPERATIONS DEPARTMENT POLICY</b>	Rev. 23
<b>TECHNICAL SPECIFICATION GUIDANCE</b>	Date 01/16/08
	Page 10 of 19

**Operational Guidance for Section 3 / 4.6**

**3 / 4.6.6.1 Shield Building Ventilation System**

When complying with action statement for Technical Specification 3.6.6.1c the Spent Fuel Handling Machine is considered to have no load when no load is attached to the grapple. With no load attached to the grapple the Spent Fuel Handling Machine May be operated over the Spent Fuel Pool.

**3 / 4.6.3 Containment Isolation Valves**

<p><b><u>NOTE</u></b></p> <ul style="list-style-type: none"> <li>• The inoperable containment isolation valve may be used to provide containment isolation in order to comply with Tech Spec 3.6.3.1.</li> <li>• Containment penetration check valves are typically not found in the DBD. Tech Spec 3.6.3.1 applies to all containment isolation check valves.</li> </ul>
---

1. Any valve on a line that penetrates the containment may be a containment isolation valve.
  - A. To determine if it is a containment isolation valve reference ADM-68.01, Containment Leakage Rate Testing Program, Unit #1 UFSAR table 6.2-16 and Unit #2 tables 6.2-52 & 53.
  - B. If the valve in question is listed in ADM-68.01, then apply Tech Spec 3.6.3.1.
  - C. If the valve in question is determined to be a containment isolation valve, but not listed in ADM 68.01, then consult the DBD (Design Basis Documents) to determine its safety related function(s).
  - D. If any one of the DBD safety related functions require the valve to be closed, then apply Tech Spec 3.6.3.1 Containment Isolation Valves.
  - E. If all of the DBD safety related function(s) require the valve to be open, (for example: FCV-07-1A), then Tech Specs 3.6.1.1 and 3.6.3.1 are not applicable.
  - F. If the valve is required to be closed by the DBD and/or Tech Spec 3.6.3.1 and needs to be opened for any reason, then apply Tech Spec 3.6.1.1 Containment Vessel Integrity and refer to ADM-25.04 Technical Specification Bases for required contingency actions.
    - \* • If the option to station an operator at an open containment isolation is employed, then initiate a Data Sheet 30 to require and track communication checks every hour.
  - G. For any inoperable containment isolation valve, consider any system specific Tech Specs that may apply.

SECTION NO.: 3/4.6	TITLE: TECHNICAL SPECIFICATIONS BASES ATTACHMENT 8 OF ADM-25.04 CONTAINMENT SYSTEMS ST. LUCIE UNIT 1	PAGE: 3 of 10
REVISION NO.: 4		

**BASES FOR SECTION 3/4.6**

**3/4.6 CONTAINMENT SYSTEMS**

**BASES**

**3/4.6.1 CONTAINMENT VESSEL**

**3/4.6.1.1 CONTAINMENT VESSEL INTEGRITY**

CONTAINMENT VESSEL INTEGRITY ensures that the release of radioactive materials from the containment atmosphere will be restricted to those leakage paths and associated leak rates assumed in the accident analyses. This restriction, in conjunction with the leakage rate limitation, will limit the site boundary radiation doses to within the limits of 10 CFR Part 100 during accident conditions.

In accordance with Generic Letter 91-08, "Removal of Component Lists from Technical Specifications," the opening of locked or sealed closed containment isolation valves on an intermittent basis under administrative control includes the following considerations: (1) stationing an operator, who is in constant communication with the control room, at the valve controls, (2) instructing this operator to close these valves in an accident situation, and (3) assuring that environmental conditions will not preclude access to close the valves and this action will prevent the release of radioactivity outside the containment.

**3/4.6.1.2 CONTAINMENT LEAKAGE**

The limitations on containment leakage rates ensure that total containment leakage volume will not exceed the value assumed in the accident analyses at the peak accident pressure,  $P_a$  (39.6 psig) which results from the limiting design basis loss of coolant accident.

The surveillance testing for measuring leakage rates is performed in accordance with the Containment Leakage Rate Testing Program and is consistent with the requirements of Appendix "J" of 10 CFR 50, Option B and Regulatory Guide 1.163 Rev. 0, as modified by approved exemptions.

**3/4.6.1.3 CONTAINMENT AIR LOCKS**

The limitations on closure and leak rate for the containment air locks are required to meet the restrictions on CONTAINMENT INTEGRITY and containment leak rate. Surveillance testing of the air lock seals provides assurance that the overall air lock leakage will not become excessive due to seal damage during the intervals between air lock leakage tests.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>1</u>
	K/A #	<u>2.1.25</u>	_____
	Importance Rating	_____	<u>4.2</u>

005 / Residual Heat Removal Ability to interpret reference materials, such as graphs, curves, tables, etc.

Proposed Question: SRO 86

Given the following conditions on Unit 2:

- Unit 2 is entering a refueling outage
- RCS temperature is 152°F at atmospheric pressure
- 2A LPSI pump is running with crosstie valve V3545 is OPEN
- Pressurizer level is 10% Cold Cal.
- Reactor has been subcritical for 130 hours
- CCW temperature is 85°F
- Shutdown Cooling flow is 3500 gpm

Based on these conditions, what actions, if any, are required?

- A. Lower MAXIMUM shutdown cooling flow to < 3300 gpm.
- B. Lower MAXIMUM shutdown cooling flow to < 2850 gpm.
- C. Lower MAXIMUM shutdown cooling flow to <2600 gpm.
- D. NO actions are required.

Proposed Answer: A

Explanation (Optional):

- A. Correct – V3545 is OPEN
- B. Incorrect – this value is used IF V2850 is OPEN
- C. Incorrect – NOT maximum
- D. Incorrect –NOT maxium

Technical Reference(s): 2-NOP-03.05 Shutdown Cooling (Attach if not previously provided)

Proposed references to be provided to applicants during examination: 2-NOP-03.05  
Appendix C

Learning Objective: 0702207-5B (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

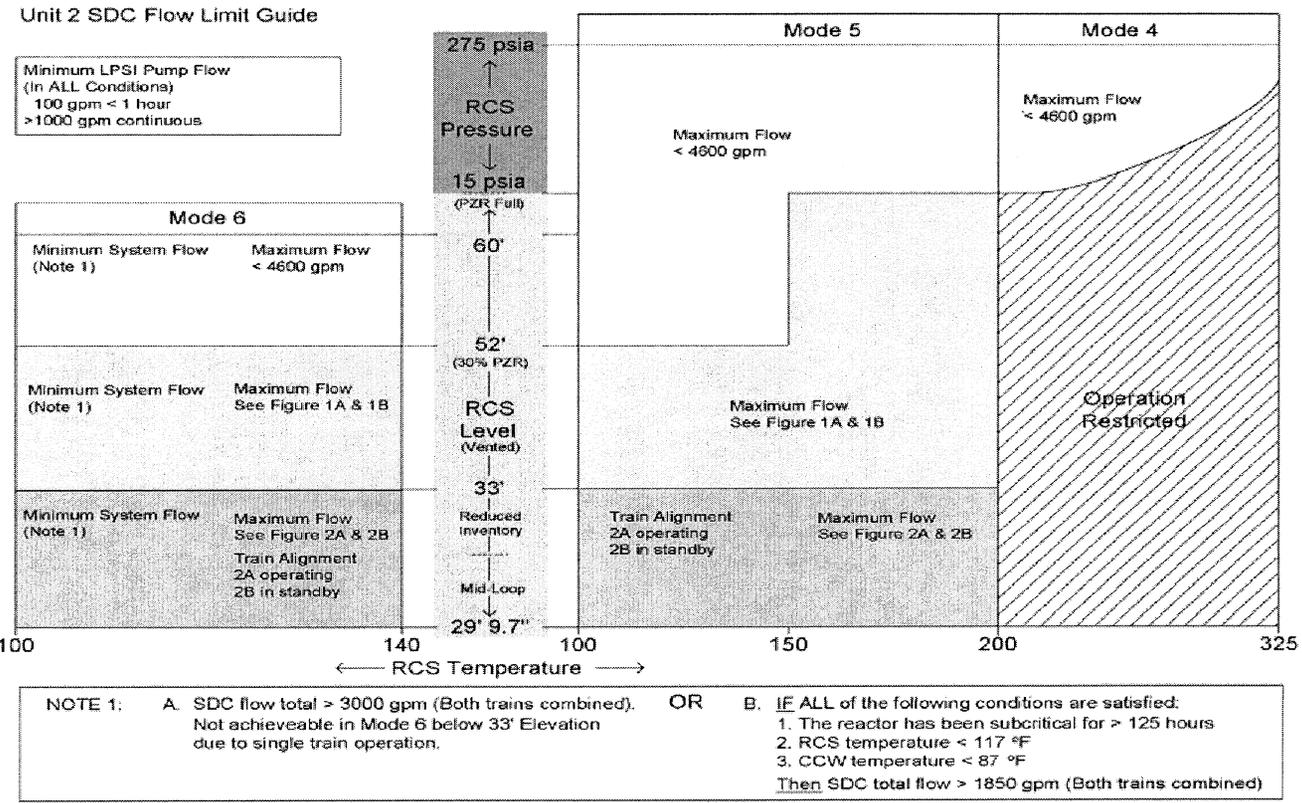
Comments:

REVISION NO.:  
35  
PROCEDURE NO.:  
2-NOP-03.05

PROCEDURE TITLE:  
SHUTDOWN COOLING  
ST. LUCIE UNIT 2

PAGE:  
143 of 149

**APPENDIX C**  
**SDC & LPSI PUMP FLOW REQUIREMENTS**  
(Page 1 of 5)



THIS A OPERATOR AID (QA). IF THIS FIGURE IS REVISED, THE (QA) WILL ALSO HAVE TO BE REVISED. (FIDPS2-NOP-03.05/Append C-1/Rev 04/01)

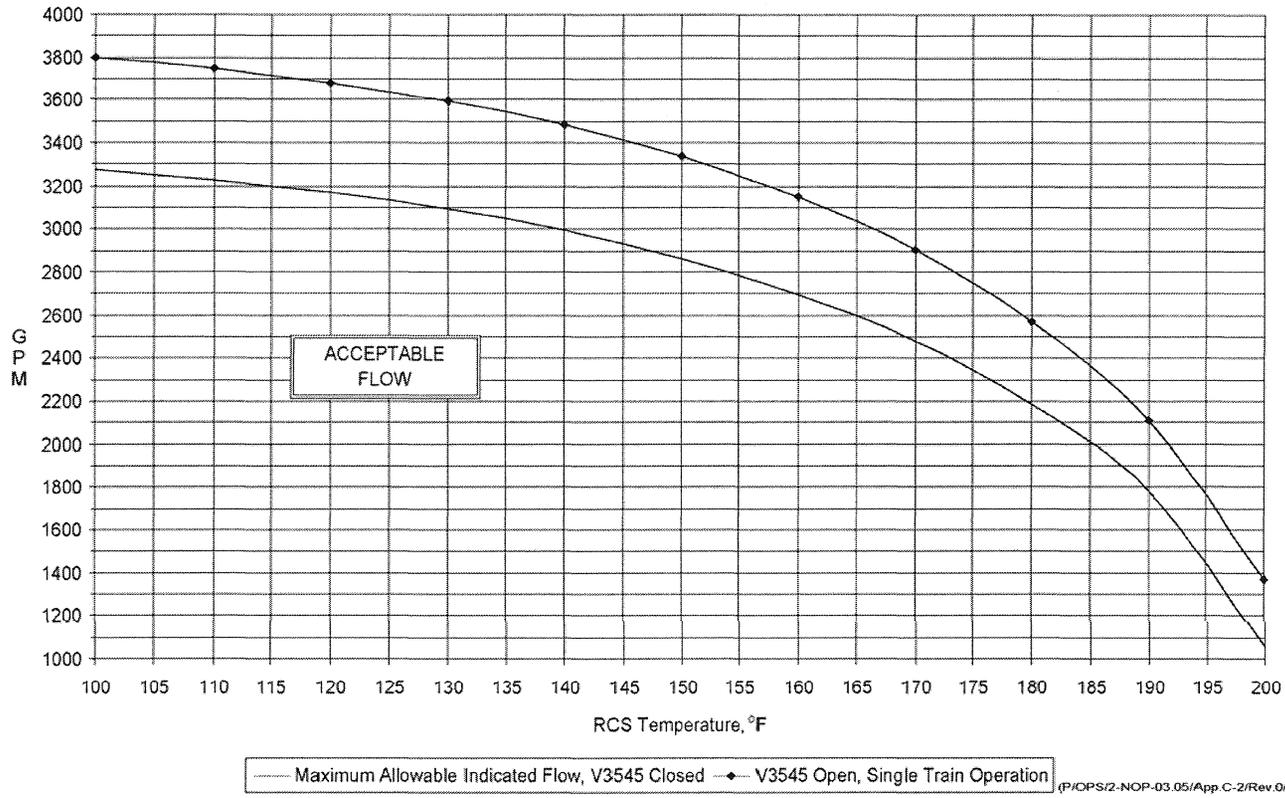
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35  
PROCEDURE NO.:  
2-NOP-03.05

PROCEDURE TITLE:  
SHUTDOWN COOLING  
ST. LUCIE UNIT 2

PAGE:  
144 of 149

**APPENDIX C**  
**SDC & LPSI PUMP FLOW REQUIREMENTS**  
(Page 2 of 5)

FIGURE 1A  
2A LPSI PUMP FLOW LIMITS  
RCS / REFUELING CAVITY LEVEL BETWEEN 52 FT AND > 33 FT



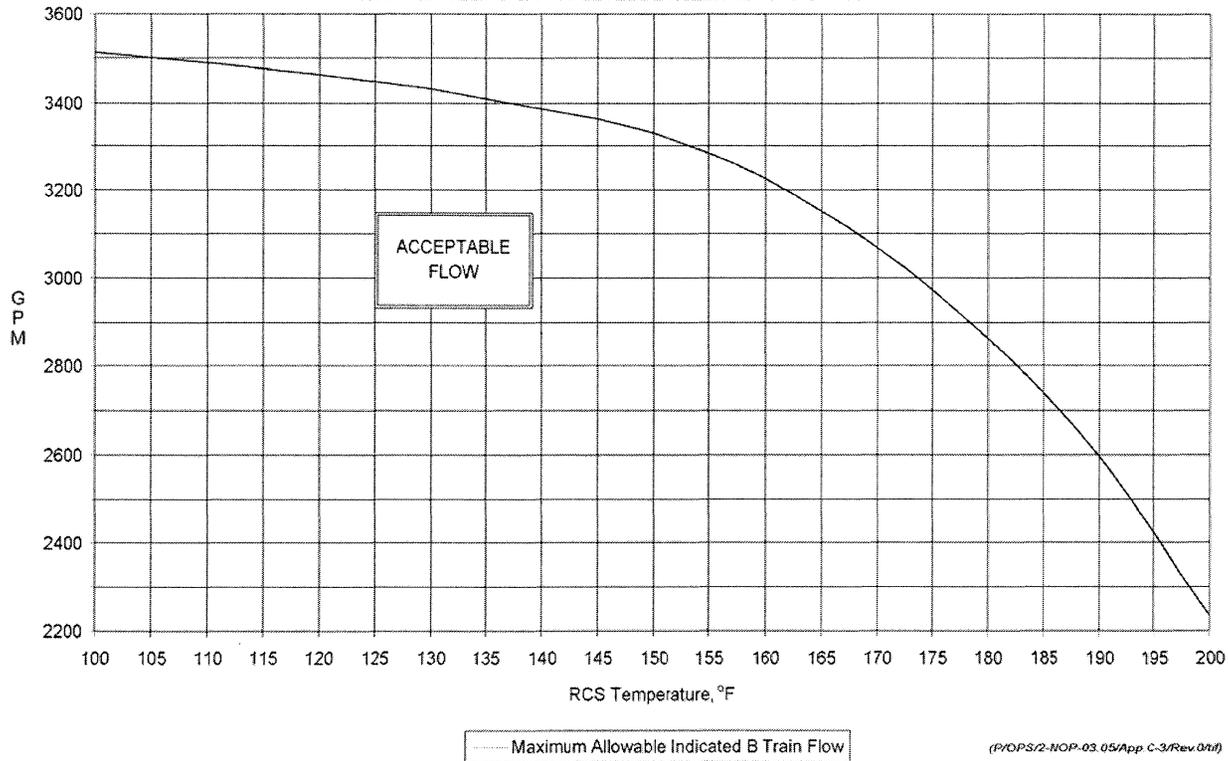
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35  
PROCEDURE NO.:  
2-NOP-03.05

PROCEDURE TITLE:  
SHUTDOWN COOLING  
ST. LUCIE UNIT 2

PAGE:  
145 of 149

**APPENDIX C**  
**SDC & LPSI PUMP FLOW REQUIREMENTS**  
(Page 3 of 5)

FIGURE 1B  
2B LPSI PUMP FLOW LIMITS  
RCS / REFUELING CAVITY LEVEL BETWEEN 52 FT AND > 33 FT



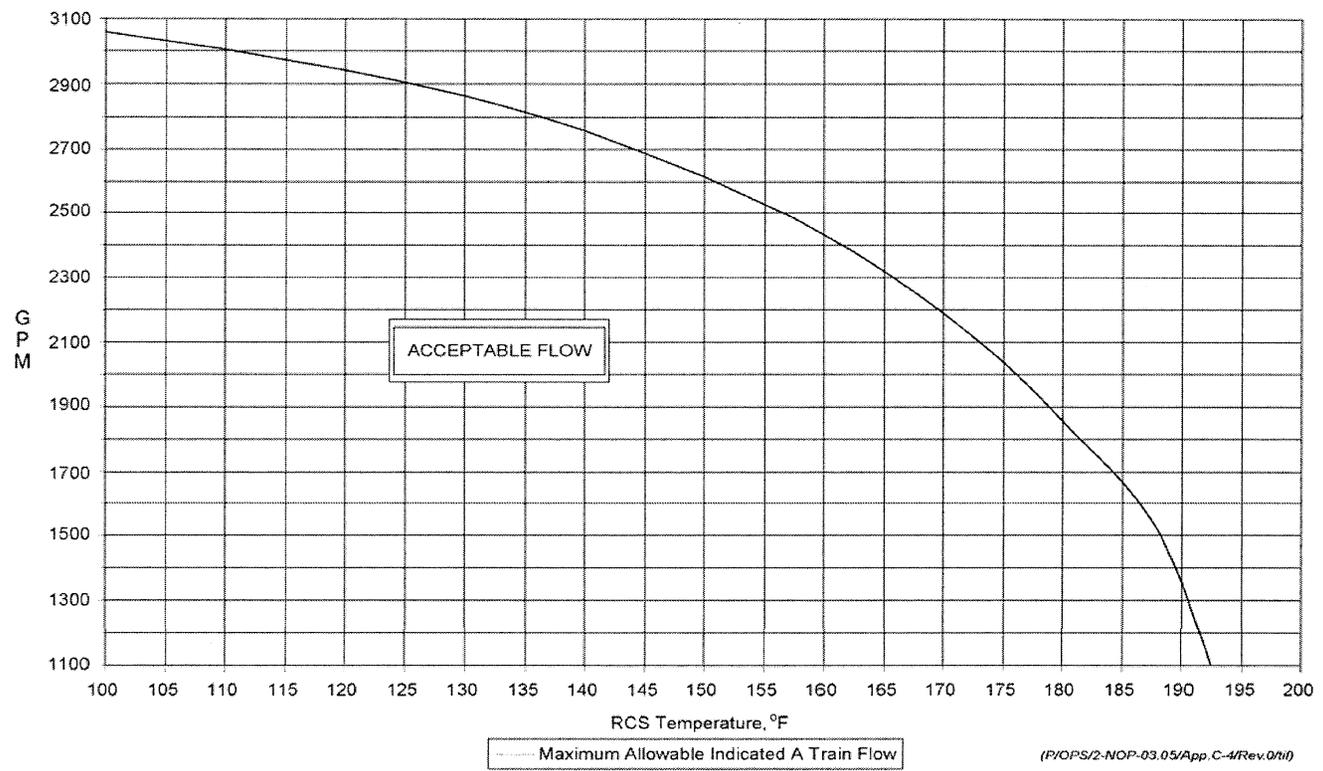
REVISION NO.:  
35  
PROCEDURE NO.:  
2-NOP-03.05

PROCEDURE TITLE:  
SHUTDOWN COOLING  
ST. LUCIE UNIT 2

PAGE:  
146 of 149

**APPENDIX C**  
**SDC & LPSI PUMP FLOW REQUIREMENTS**  
(Page 4 of 5)

FIGURE 2A  
2A LPSI PUMP FLOW LIMITS  
RCS LEVEL BETWEEN 33 FT AND 29 FT, 9.7 INCHES



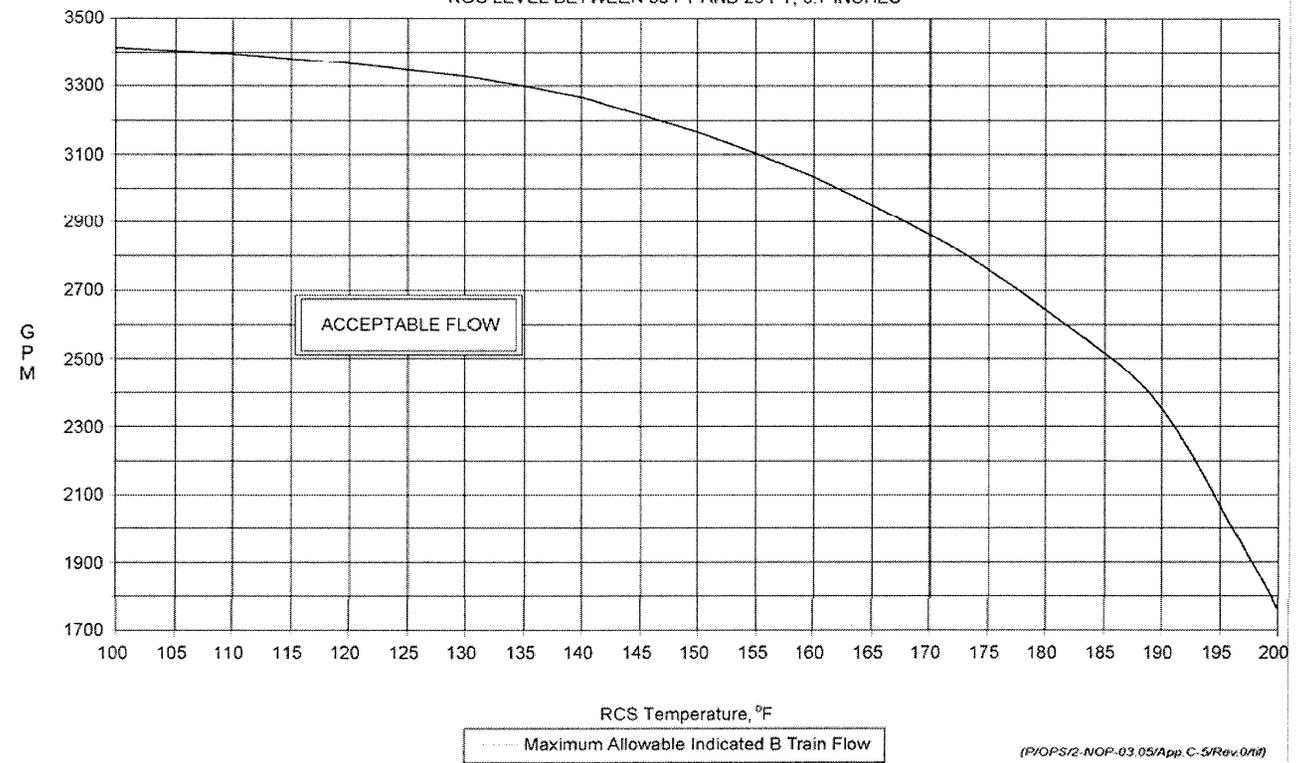
REVISION NO.:  
35  
PROCEDURE NO.:  
2-NOP-03.05

PROCEDURE TITLE:  
SHUTDOWN COOLING  
ST. LUCIE UNIT 2

PAGE:  
147 of 149

**APPENDIX C**  
**SDC & LPSI PUMP FLOW REQUIREMENTS**  
(Page 5 of 5)

FIGURE 2B  
2B LPSI PUMP FLOW LIMITS  
RCS LEVEL BETWEEN 33 FT AND 29 FT, 9.7 INCHES



**END OF APPENDIX C**

REVISION NO.: 35	PROCEDURE TITLE: SHUTDOWN COOLING	PAGE: 148 of 149
PROCEDURE NO.: 2-NOP-03.05	ST. LUCIE UNIT 2	

**APPENDIX D**  
**V3545, TIE ISOLATION VALVE OPERATION**  
(Page 1 of 1)

PLANT CONDITION	LPSI PUMPS OPERATING	V3545 POSITION	REASON
Przr level: > 30% Przr manway installed SDC suction valve breakers turned ON	1 or 2	OPEN	To prevent single failure of SDC suction valve overpressure auto closure circuitry from isolating both SDC loops suction
Przr level: > 30% (52 ft in Cavity) Przr manway removed SDC suction valve breakers turned OFF	1 or 2	OPEN or CLOSED	Position of V3545 does not affect LPSI pump performance and valve does not have to be open for single failure of auto closure circuitry
Przr level < 30% to > 33 ft RCS level Przr manway removed SDC suction valve breakers turned OFF	2A only	OPEN or CLOSED	If V3545 is open, the 2A LPSI pump can operate at higher flows.
	2B only	CLOSED	V3545 open does not improve B loop suction and with valve closed, A loop can be started without jeopardizing pump due to inadequate suction conditions
	2	CLOSED	To prevent A loop suction flow from being diverted to B loop
RCS level <33 ft to > 29ft, 9.7 inches Przr manway removed SDC suction valve breakers turned OFF	1	CLOSED	To prevent losing suction prime on both loops if the operating loop loses prime

**END OF APPENDIX D**

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	2.1.25	
	Importance Rating		4.2

005 / Residual Heat Removal Ability to interpret reference materials, such as graphs, curves, tables, etc.

Proposed Question: SRO 86

Given the following conditions on Unit 2:

- Unit 2 is entering a refueling outage
- RCS temperature is 152°F at atmospheric pressure
- 2A LPSI pump is running with crosstie valve V3545 is OPEN
- Pressurizer level is 10% Cold Cal.
- Reactor has been subcritical for 130 hours
- CCW temperature is 85°F
- Shutdown Cooling flow is 3500 gpm

Based on these conditions, what actions, if any, are required?

- A. Lower MAXIMUM shutdown cooling flow to < 3300 gpm.
- B. Lower MAXIMUM shutdown cooling flow to < 2850 gpm.
- C. Lower MAXIMUM shutdown cooling flow to <2600 gpm.
- D. NO actions are required.

Proposed Answer: A

Explanation (Optional):

- A. Correct – V3545 is OPEN
- B. Incorrect – this value is used IF V2850 is OPEN
- C. Incorrect – NOT maximum
- D. Incorrect –NOT maxium

Technical Reference(s): 2-NOP-03.05 Shutdown Cooling (Attach if not previously provided)

Proposed references to be provided to applicants during examination: 2-NOP-03.05  
Appendix C

Learning Objective: 0702207-5B (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 #	_____	2
	Group #	_____	1
	K/A #	2.2.37	_____
	Importance Rating	_____	4.6

022 / Containment Cooling Equipment Control / Ability to determine operability and/or availability of safety related equipment

Proposed Question: SRO 87

Given the following:

- Unit 1 is at 100% power.
- I&C personnel are troubleshooting a vibration problem on HVS-1B, Containment Cooling Fan.
- It is desired to stop the 1B Containment Cooling Fan and return the control switch to AUTO for approximately one hour, while troubleshooting continues.
- All other Containment Cooling Fans are in operation.

Which one of the following describes the administrative requirement while the 1B Containment Cooling Fan is NOT running and in this configuration?

Declare the:

- A. 1A Emergency Diesel Generator inoperable.
- B. 1A Offsite Power Circuit inoperable.
- C. 1B Emergency Diesel Generator inoperable.
- D. 1B Offsite Power Circuit inoperable.

Proposed Answer: B

Explanation (Optional):

- A. Offsite power not Diesel
- B. Correct
- C. 1B fan is powered from the 'A' side
- D. 1B fan is powered from the 'A' side

Technical Reference(s): 1-NOP-25.04 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: \_\_\_\_\_ (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:

REVISION NO.: 3	PROCEDURE TITLE: CONTAINMENT FAN COOLER OPERATIONS	PAGE: 6 of 10
PROCEDURE NO.: 1-NOP-25.04	ST. LUCIE UNIT 1	

- 4.6** ¶<sub>4</sub> Exceeding the following starting duty may damage motor windings:
1. Two consecutive cold starts (windings not at operating temperature).
  2. One hot start (windings at operating temperature).
  3. Subsequent starts are allowed as follows:
    - After 15 minutes with motor running between starts.
    - After 45 minutes with motor NOT running between starts.
- 4.7** ¶<sub>2,3</sub> Momentary Overload and Flow Low / Vibration High alarms are considered normal when starting or stopping containment fan coolers. Alarms that persist require investigation.
- 4.8** ¶<sub>5</sub> A time delay of at least 2 minutes should be allowed between stopping and restarting the same Containment Fan Cooler to allow time for coastdown. This will reduce the occurrence of Ovrd / Trip and Flow Low / Vibration High alarms.
- 4.9** §<sub>1</sub> When in modes 1, 2, or 3, If a running Containment Fan Cooler is stopped for reasons other than the monthly fan cooler surveillance, but is capable of starting on SIAS, Then the associated offsite power circuit is required to be declared inoperable. A Condition Report is required for Engineering to evaluate the conditions to determine offsite power operability status.
- 5.0** RECORDS REQUIRED
- 5.1** RCO Chronological Log entries.

REVISION NO.: 3	PROCEDURE TITLE: CONTAINMENT FAN COOLER OPERATIONS	PAGE: 7 of 10
PROCEDURE NO.: 1-NOP-25.04	ST. LUCIE UNIT 1	

**6.0 INSTRUCTIONS** INITIAL

**6.1 System Startup**

1. ENSURE Section 3.0, Prerequisites, completed. \_\_\_\_\_
2. REVIEW Section 4.0, Precautions / Limitations. \_\_\_\_\_
3. ENSURE the following breakers are RACKED IN:
  - Bkr 1-40205, Air Recirc Unit Fan HVS-1A, on 480V Swgr 1A2 \_\_\_\_\_
  - Bkr 1-40206, Air Recirc Unit Fan HVS-1B, on 480V Swgr 1A2 \_\_\_\_\_
  - Bkr 1-40505, Air Recirc Unit Fan HVS-1C, on 480V Swgr 1B2 \_\_\_\_\_
  - Bkr 1-40506, Air Recirc Unit Fan HVS-1D, on 480V Swgr 1B2 \_\_\_\_\_

**NOTE**

- During normal operation, four Containment Fan Coolers are in operation with cooling water flowing through all four cooling coils. On receipt of a SIAS signal, all fans will start.
- Non-applicable steps in this section should be marked N/A.
- §1 When in modes 1, 2, or 3, If a running Containment Fan Cooler is stopped for reasons other than the monthly fan cooler surveillance, but is capable of starting on SIAS, Then the associated offsite power circuit is required to be declared inoperable. A Condition Report is required for Engineering to evaluate the conditions to determine offsite power operability status.

4. START the Containment Fan Coolers by placing the control switch to START on RTGB-106:
  - HVS-1A, Containment Fan Cooler A \_\_\_\_\_
  - HVS-1B, Containment Fan Cooler B \_\_\_\_\_
  - HVS-1C, Containment Fan Cooler C \_\_\_\_\_
  - HVS-1D, Containment Fan Cooler D \_\_\_\_\_

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	2.2.42	
	Importance Rating		4.6

026 / Containment Spray Equipment Control / Ability to recognize system parameters that are entry level conditions for Technical Specifications..

Proposed Question: SRO 88

*ATK*

A quarterly code run in accordance with 2-OSP-07.04B Data Sheet 1 has been performed on the 2B Containment spray pump.

The following data has been obtained:

- Refueling Water Storage Tank Level: 35.3 ft.
- Discharge Pressure: 224 psig

Which of the following states the operability status, including the basis and action required, if any, of the 2B Containment Spray Pump?

- A. OPERABLE; Pump discharge pressure meets USFAR requirements. No Action required *add plausible*
- B. INOPERABLE; Acceptance criteria is determined to be in the Required Action Range LOW. Declare the pump out of service and apply applicable Technical Specification.
- C. OPERABLE; Calculated pump head is determined to be Acceptable. No action required.
- D. INOPERABLE; Acceptance criteria is determined to be in the Required Action Range HIGH. Declare the pump out of service and apply applicable Technical Specification.

Proposed Answer: B

Explanation (Optional):

- A. Meets the UFSAR requirement of > or = to 200 psig but pump head does not
- B. Correct
- C. Pump head is low
- D. Pump head is low

Technical Reference(s): ADM-29.02 ASME Code Testing of Pumps and Valves (Attach if not previously provided)  
2-OSP-07.04B Data Sheet 1

Proposed references to be provided to applicants during examination: 2-OSP-07.04B Data

Learning Objective: PSL NLI ADM 757 LPC 2&3 (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 2

Comments:

REVISION NO.: 1	PROCEDURE TITLE: 2A CONTAINMENT SPRAY PUMP AND 2A HYDRAZINE PUMP CODE RUN	PAGE: 16 of 17
PROCEDURE NO.: 2-OSP-07.04B	ST. LUCIE UNIT 2	

**DATA SHEET 1**  
**2B HYDRAZINE AND CONTAINMENT SPRAY PUMPS**  
(Page 1 of 2)

Date: \_\_\_/\_\_\_/\_\_\_

2B Containment Spray Pump

RWT Level LIS-07-2B Or LIS-07-2D (ft.)	Disch. Press PI-07-1B (psig) (2)	Calculated Pump Head (ft.) (1)	Vibration Instr. No. _____ (3)					
			Peak Velocity (in. / sec.)					
			LMN	LME	UMN	UME	LMA	
35.3	224	397.5						
§1 Acceptance Criteria	Allowable Range	462.7 to 565.5	< 0.250	< 0.175	< 0.325	< 0.325	< 0.275	
	Alert Range	N/A	0.250 to 0.600	0.175 to 0.420	0.325 to 0.700	0.325 to 0.700	0.275 to 0.660	
	Required Action	< 462.7 or > 565.5	> 0.600	> 0.420	> 0.700	> 0.700	> 0.660	

- (1) §1 Calculated Pump Head = (Disch. Press. X 2.307) - (RWT level + 23.5 ft)  
(2) Discharge Pressure must be greater than or equal to 200 psig per the UFSAR.  
(3) For pump vibration location drawing see ADM-29.02, ASME Code Testing of Pumps and Valves

456.3 - 58.8

Calculation of Pump Head reviewed by: \_\_\_\_\_

35.3 + 23.5 =

The data has been compared to the acceptance criteria and determined to be:

Acceptable    Alert Range    Required Action Range

Purpose of Test:

Quarterly Code Run    Post Maintenance    Other \_\_\_\_\_

Q-88

REVISION NO.: 7B	PROCEDURE TITLE: ASME CODE TESTING OF PUMPS AND VALVES	PAGE: 14 of 67
PROCEDURE NO.: ADM-29.02	ST. LUCIE PLANT	

**6.6 Pump Corrective Action**

1. When any pump test parameter falls outside the Allowable Ranges a Condition Report shall be initiated.
2. If any of the pump test parameters exceeds a Required Action level, the pump shall be declared out of service (OOS) and not returned to service until the cause of the deviation is determined and the condition corrected.
3. If any of the pump test parameters exceeds an Alert level, the frequency of testing shall be doubled and a Data Sheet 30, Unscheduled Surveillance Tracking, of OP 1/2-0010125A shall be initiated to schedule the test within forty-six (46) days.
4. Further corrective action may include:
  - A. Recalibration of the appropriate instruments followed by retest of the pump. If the subsequent test is satisfactory the pump may be declared operable, and the Alert range or normal test frequency may be resumed as appropriate.
  - B. Repair or replacement of the defective component(s) followed by retest of the pump. If the Post Maintenance test is satisfactory, the pump may be declared operable, and the Alert range or normal test frequency may be resumed as appropriate.
  - C. If it is suspected that an Alert range measurement may have been anomalous in that the Alert range measurement cannot be readily duplicated, and no other symptoms indicating the pump is not performing acceptably are evident, then the pump may be removed from Alert range test frequency following three (3) successive tests in which allowable range measurements were obtained.
5. Alert or Required Action pump tests shall be documented on their normal test form (data sheet or procedure).
6. Pump operability based upon analysis shall be documented under a Condition Report evaluation.
7. Justification for continued operation may be considered in cases where Code compliance cannot be achieved due to a degraded or nonconforming condition in accordance with the provisions of Generic Letter 91-18.

**END OF SECTION 6.6**

REVISION NO.: 1	PROCEDURE TITLE: 2A CONTAINMENT SPRAY PUMP AND 2A HYDRAZINE PUMP CODE RUN	PAGE: 17 of 17
PROCEDURE NO.: 2-OSP-07.04B	ST. LUCIE UNIT 2	

**DATA SHEET 1**  
**2B HYDRAZINE AND CONTAINMENT SPRAY PUMPS**  
(Page 2 of 2)

Date \_\_\_\_\_

**2B HYDRAZINE PUMP**

§ <sub>1</sub> Pump Rotative Speed Instrument No. _____ (RPM) (1)

(1) §<sub>1</sub> Pump rotative speed of 38 rpm confirms actual pump flow to be between 0.71 and 0.82 gpm to meet Technical Specification requirements.

The above data has been compared to the acceptance criteria and determined to be:

Acceptable    Alert Range    Required Action Range

Purpose of Test:  Quarterly Code Run    Post Maintenance    Other \_\_\_\_\_

I have reviewed the requirements of this procedure including other surveillances performed during this procedure, if any (i.e., datasheet(s), PMT sheet(s), etc.). Any deviation(s) found during the performance of this procedure has (have) been listed and appropriate actions and notifications made.

\_\_\_\_\_(RCO) \_\_\_\_\_(SM / US)

**END OF DATA SHEET 1**

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>1</u>
	K/A #	A2.16	
	Importance Rating	_____	<u>3.7</u>

064 / Emergency Diesel Generator Ability to (a) predict the impacts of the following malfunctions or operations on the ED/G system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of offsite power during full-load testing of ED/G.

Proposed Question: 89

Given the following:

- Unit 1 is at 100% power.
- 1A EDG surveillance is in progress. The Diesel is fully loaded.
- The 1B MFW trips and the crew manually trips the Reactor.
- A LOOP occurs on the trip and the 1B EDG trips after the LOOP.

Which of the following procedures should be implemented after exiting 1-EOP-01 Standard Post Trip Actions?

- A. 1-EOP-06 Total Loss of Feedwater.
- B. 1-EOP-09 Loss of Offsite Power.
- C. 1-EOP-15 Functional Recovery.
- D. 1-EOP-10 Blackout.

Proposed Answer: D

Explanation (Optional):

- A. 1A EDG will trip on LOOP 1C AFW would be available
- B. Both Diesels not available
- C. Does not meet entry conditions
- D. Correct, both EDG's out of service; 1A EDG trips on overcurrent

Technical Reference(s): 1-OSP-59.01A 1A EDG Monthly (Attach if not previously provided)  
Surveillance  
1-EOP-10 Blackout  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702830-10 (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-89

REVISION NO.: 2	PROCEDURE TITLE: 1A EMERGENCY DIESEL GENERATOR MONTHLY SURVEILLANCE ST. LUCIE UNIT 1	PAGE: 22 of 39
PROCEDURE NO.: 1-OSP-59.01A		

6.1 Test the 1A Diesel Generator as follows: (continued)

INITIAL

**NOTE**

When a Diesel Generator is paralleled to the 4.16 KV bus the LOOP undervoltage relay protection scheme is blocked and therefore not available to protect the Diesel Generator from tripping due to a system disturbance. For this reason the Diesel Generator is considered Out of Service during the entire length of time the Diesel Generator is tied to the 4.16 KV bus during surveillance testing.

22. Insert the Sync Plug and turn to the DG-1A position. RCO

23. ¶<sub>2</sub> ENSURE incoming voltage is slightly higher than running voltage and that the Sync Scope is moving slowly in the fast direction. RCO

**CAUTION**

Failure to ensure the EDG assumes an initial load of at least 100 kW may result in a reverse power trip.

24. Slow Sync Scope to no more than one (1) revolution per 60 seconds and close 1A Diesel Output breaker (1-20211) just before it reaches the 12 o'clock position. Record time of breaker closure in the Chronological log. RCO

25. If the 1A Diesel Output breaker fails to close, Then slow down Sync Scope further or stop at the 12 o'clock position for approximately 5 seconds, Then attempt to close breaker. RCO

**NOTE**

While synchronized to the grid the diesel generator will not load properly unless the voltage regulator is adjusted so that MEGAVAR meter is in LAG (out on MEGAVAR meter).

26. If the diesel generator has been running unloaded or at low load (less than 700 KW) for greater than four and one-half hours, Then perform the following:

819 0

0802008-28

EDG

1

1 07/21/03

System Sort

QID Sort

Unit 1 A diesel generator is loaded to the grid during surveillance testing.

Which of the following explains the response of the 1A diesel during a LOOP with the above conditions?

The diesel:

A. output breaker will open and reclose, sequencing loads on the bus.



B. tries to pick up all unit loads, resulting in an overcurrent trip.

Correct

C. output breaker trips open and stays open until manually closed.

B.

D. output breaker trips on differential current.

0

Exit  
Databas

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

076 Service Water Ability to (a) predict the impacts of the following malfunctions or operations on the SWS; and (b) 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 on Unit 1:

- Mode 1 100% power
- All AB Buses are aligned to the B side
- 1C ICW pump is mechanically aligned to the B side
- 1A and 1B ICW pumps are in service
- The 1A ICW pump trips and cannot be restarted

Which of the following is the correct sequence of steps to restore the 1A ICW header?

- Throttle the discharge valve on the 1C pump.  
Start the 1C ICW pump.  
Realign, the valves to the A side.  
Declare the B side offsite power source out of service.
- Start the 1C ICW pump.  
Realign, the valves to the A side.  
Declare the B side offsite power source out of service.
- Align all the electrical AB busses to the A side.  
Throttle the discharge valve on the 1C ICW pump.  
Realign the 1C ICW pump valves to the A side.  
Start the 1C ICW pump.
- Align the AB 4.16 KV bus to the A side.  
Realign the 1C ICW pump valves to the A side,  
Throttle the discharge valve on the 1C ICW pump.  
Start the 1C ICW pump.

Proposed Answer: D

Explanation (Optional):

- A. Must align AB 4.16KV bus to applicable side prior to starting pump
- B. Discharge valve not throttle prior to start. Electrical not proper aligned
- C. All AB busses are not required to be aligned prior to pump start
- D. Correct

Technical Reference(s): 1-NOP-21.03 Intake Cooling Water System Operation (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702313-3 (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:

JKO 90

REVISION NO.: 37B	PROCEDURE TITLE: INTAKE COOLING WATER SYSTEM	PAGE: 6 of 62
PROCEDURE NO.: 1-0640030	ST. LUCIE UNIT 1	

7.0 OPERATOR ACTIONS

7.1 Immediate Operator Actions

- 1. None

7.2 Subsequent Operations Actions:

**INSTRUCTIONS**

**CONTINGENCY ACTIONS**

<p><b><u>CAUTION</u></b></p> <ul style="list-style-type: none"> <li>• If affected ICW header indicates 0 pressure, the standby pump discharge valve must be throttled prior to starting.</li> <li>• ¶<sub>1</sub> 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.</li> </ul>
--

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

- A. ¶<sub>2</sub> 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-21.03, ICW system operation, and start the standby pump.

- 1. 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-NOP-53.01, Main Generator.
  - 3. Reduce turbine load as needed to within the heat removal capability of the TCW system.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>2</u>
	K/A #	<u>A2.02</u>	
	Importance Rating	_____	<u>4.1</u>

017 / Incore Temperature Monitor Ability to (a) predict the impacts of the following malfunctions or operations on the ITM system; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Core damage.

Proposed Question: SRO 91

Unit 1 is experiencing a large break LOCA.

- All RCP's are OFF.
- RCS pressure is 100 psia.

Which of the following would indicate possible core damage and what mitigation step will have the GREATEST impact on regaining core cooling?

- CET temperature is  $>22^{\circ}\text{F}$  superheat;  
Verify Total injection flow with 1 full train in operation  $\geq 2500$  gpm
- CET temperature is  $>22^{\circ}\text{F}$  superheat;  
Verify Steam Generators are feeding and steaming to establish reflux boiling
- $T_{\text{hot}}$  indicates saturation conditions;  
Verify Total injection flow with 2 full trains in operation  $\geq 4500$  gpm
- $T_{\text{hot}}$  indicates saturation conditions;  
Verify Steam Generators are feeding and steaming to establish reflux boiling.

Proposed Answer: A

Explanation (Optional):

- Correct
- SG's are not coupled to RCS on large break LOCA
- Criteria for inadequate core cooling is CET temperature
- Criteria for inadequate core cooling is CET temperature

Technical Reference(s): FR/SFSC 1-25 EOP Deviations and Justifications (Attach if not previously provided)

\_\_\_\_\_

\_\_\_\_\_

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702824-13 (As available)

Question Source: Bank # 2175  
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 \_\_\_\_\_  
55.43 5

Comments:

### EOP DEVIATIONS AND JUSTIFICATIONS

**EOP Title:** Functional Recovery

**EOP Procedure No.:** 1 - EOP - 15

**Revision No.** 27

**Corresponding EPG Title:** Functional Recovery Guideline

- 3. The wording is slightly different in the EOP than in the EPG. It is stated at the top of the safety function success path that HPSI Throttling Criteria is not met.
- 4. The EPG delineates adequate safety injection flow [LPSI flow and HPSI flow]. The EOP step evaluates Figure 2, of 1-EOP-99, for acceptable safety injection flow. Under HPSI Throttling Criteria NOT met, the EOP step adds an 'OR' contingency step for RAS with at least one HPSI pump running. The EPG does not include this step.

**Technical Justification:**

- 1. The use of 22 degrees F superheat was added to ensure the core remains covered. The intent of the step is to ensure that reactor vessel level is greater than the top of the active fuel region. As stated in PSL-ENG-SEIS-01-046, "This engineering limit is based on the saturation temperature of the RCS. The intent of the engineering limit is to provide an indication that can be used by the operator to assess the status of core heat removal and corroborate core covered or core uncovered with the aid of Reactor Vessel Level Monitoring System (RVLMS). A rising superheated reading indicates that core uncover is occurring and that core heat removal is inadequate. During the progression of an inadequate core cooling event, true vessel fluid temperature will plateau at the saturation point while vessel level decreases towards the top of the fuel. The QSPDS Rep CET algorithm includes a bias term that is added to the true average, to ensure the calculated temperature is conservative. The bias is based on the number of valid CETs and the standard deviation, but is also limited to 20 degrees F above the highest individual CET. Due to this bias, the Rep CET temperature is expected to read up to 20 degrees superheat (rather than the true average fluid temperature of 0 degrees F) during this plateau time, as level is lost in the upper plenum region. Once core uncover occurs, the exposed length of the fuel bundles will superheat the rising steam. The amount of superheat will then rapidly increase as the exposed fuel bundle length is increased. In Non-LOCA EOPs a setpoint of no superheat is conservatively used. During a LOCA event, actual saturation conditions are expected to be reached in the reactor vessel. Therefore, the LOCA safety function status checks must account for the bias above the true average CET temperature to prevent unnecessarily exiting to (1-EOP-15) the Functional Recovery Procedure. The value of 22 degrees F superheat has been historically used in the EOPs. This value accounts for the maximum built-in bias of 20 degrees F (algorithm bias) and includes 2 degrees F for uncertainty of the highest individual CET." Therefore, the QSPDS algorithm has biased the calculation in the conservative direction. Due to historical and human factor considerations, the value of 22 degrees F superheated will remain in the LOCA (1-EOP-03) EOP and no superheat will be used for non-LOCA EOPs. The intent of the EPG is maintained.

# Single Question Report

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<b>QID#:</b> 2175	<b>Objective:</b> 0702824-13	<b>System:</b> EOP-03		
<b>Rev:</b> 0	<b>Cog Level:</b> 2	<b>KA #</b> 017.A2.02	<b>RO</b> 3.6	<b>SRO</b> 4.1

---

Unit 1 is experiencing a large break LOCA. All RCP's are off.

Which of the following would indicate possible core damage and what mitigation step will have the greatest impact on regaining core cooling?

- A. CET temperature is >22°F superheat, verify ECCS flow meets Figure 2.
- B. CET temperature is >22°F superheat, verify Steam Generators are feeding and steaming.
- C. T-hot indicates saturation conditions, verify ECCS flow meets Figure 2.
- D. T-hot indicates saturation conditions, verify Steam Generators are feeding and steaming.

**Reasons the choices are right or wrong.**

**Correct answer is A.**

- A.
- B. Steam Generators are 'uncoupled' during large break LOCA's.
- C. That is not used when RCP's are off
- D. That is not used when RCP's are off, Steam Generators are 'uncoupled' during large break LOCA's

**Source Ref:** 1-EOP-03 LOCA, Plant specific technical guidelines

**Open Ref:**

**Revision Notes:** New

## Question Use History

HLC-16 PreAudit Quiz 13, 0717030, 7/13/2004  
IPT 3 Exam, 0720228, 12/11/03  
HLC-15A SRO NRC 2002, 0717005, 1/1/2002

# Single Question Report

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**QID#:** 2175    **Objective:** 0702824-13    **System:** EOP-03  
**Rev:** 0    **Cog Level:** 2    **KA #**017.A2.02    **RO** 3.6    **SRO** 4.1

---

Unit 1 is experiencing a large break LOCA. All RCP's are off.

Which of the following would indicate possible core damage and what mitigation step will have the greatest impact on regaining core cooling?

- A. CET temperature is >22°F superheat, verify ECCS flow meets Figure 2.
- B. CET temperature is >22°F superheat, verify Steam Generators are feeding and steaming.
- C. T-hot indicates saturation conditions, verify ECCS flow meets Figure 2.
- D. T-hot indicates saturation conditions, verify Steam Generators are feeding and steaming.

**Reasons the choices are right or wrong.**

**Correct answer is A.**

- A.
- B. Steam Generators are 'uncoupled' during large break LOCA's.
- C. That is not used when RCP's are off
- D. That is not used when RCP's are off, Steam Generators are 'uncoupled' during large break LOCA's

**Source Ref:** 1-EOP-03 LOCA, Plant specific technical guidelines

**Open Ref:**

**Revision Notes:**    New

**Question Use History**

- HLC-16 PreAudit Quiz 13, 0717030, 7/13/2004
- IPT 3 Exam, 0720228, 12/11/03
- HLC-15A SRO NRC 2002, 0717005, 1/1/2002

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>2</u>
	K/A #	A2.0	_____
	Importance Rating	_____	<u>3.0</u>

033 Spent Fuel Pool Cooling Ability to (a) predict the impacts of the following malfunctions or operations on the Spent Fuel Pool Cooling System ; and (b) based those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of SFPCS.

Proposed Question: SRO 92

Given the following conditions:

- Unit 1 is in Mode 6 performing a full core offload.
- Fuel Pool temperature is 98°F
- One of the two running Fuel Pool pumps has stopped and cannot be restarted.

What is the effect of this event and what action will be required?

- A. Fuel Pool temperature will rise.  
Stop core offload.
- B. Fuel Pool Temperature will rise.  
Increase CCW flow to the Fuel Pool Cooling Heat Exchangers.  
Core offload can continue
- C. Fuel Pool temperature will rise.  
When fuel pool temperature >110°F, Stop Core Offload.
- D. Fuel Pool water clarity will decrease.  
Place additional fuel pool filters in service to aid in maintaining water clarity.  
Continue with core offload.

Proposed Answer: A

Explanation (Optional): All are criteria for a full core offload. All meet criteria to continue core offload except must have both cooling pumps operating.

Technical Reference(s): 1-0350030 Fuel Pool Cooling System (Attach if not previously provided)  
1-GOP-365 Refueling Sequencing Guidelines

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702208-8B3 (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:

92

REVISION NO.: 24	PROCEDURE TITLE: FUEL POOL COOLING SYSTEM	PAGE: 6 of 18
PROCEDURE NO.: 1-0350030	ST. LUCIE UNIT 1	

7.2 Subsequent Operator Actions

**INSTRUCTIONS**

**CONTINGENCY ACTIONS**

<b>NOTE</b>
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.

- |   |  |
|---|--|
| <p>1. VERIFY Control Room annunciators are valid.</p>   | <p>1. If the Control Room annunciators are NOT valid, <u>Then</u> PERFORM the following:</p> <ul style="list-style-type: none"> <li>A. If a refueling outage is NOT in progress, <u>Then</u> INITIATE an NPWO.</li> <li>B. <b>If a refueling outage is in progress, <u>Then</u> GO TO 1-GOP-365, Refueling Sequencing Guidelines, <u>And</u> INITIATE an NPWO.</b></li> </ul>  |
| <p>2. If a full core offload outage is in progress, <u>Then</u> VERIFY <b>both</b> Fuel Pool Pumps are OPERATING.</p> | <p>2. SUSPEND core offload activities.</p> <ul style="list-style-type: none"> <li>A. VERIFY at least one Fuel Pool Pump is OPERATING.</li> <li>B. If NO Fuel Pool Pumps are operating, <u>Then</u> PERFORM the following: <ul style="list-style-type: none"> <li>1. RESET <b>either</b> of the following breakers: <ul style="list-style-type: none"> <li>• 1-41501, Fuel Pool Pump 1A</li> <li>• 1-42301, Fuel Pool Pump 1B</li> </ul> </li> <li>2. START at least one Fuel Pool Pump.</li> </ul> </li> </ul> |

REVISION NO.: 22	PROCEDURE TITLE: REFUELING SEQUENCING GUIDELINES	PAGE: 31 of 90
PROCEDURE NO.: 1-GOP-365	ST. LUCIE UNIT 1	

**APPENDIX A**  
**SURVEILLANCES PERFORMED DURING REFUELING**

**CHECK SHEET #2**  
**Surveillances Performed Each Shift While in Mode 6**  
(Page 3 of 8)

INITIAL

Nightshift    Dayshift

5. Verify the following equipment condition for the same train to support spent fuel pool cooling:

A. One emergency Diesel Generator and fuel transfer pump operable. \_\_\_\_\_

B. One Intake Cooling Water header through to the CCW heat exchanger available. \_\_\_\_\_

C. One Component Cooling Water header including the Spent Fuel Pool heat exchanger available. \_\_\_\_\_

**OR**

Approved Temporary Cooling of Spent Fuel Pool heat exchanger in service per appropriate instructions.

6. Ensure that the CCW or Temporary Cooling System flow to the Spent Fuel Pool heat exchanger is between 2900 gpm and 3738 gpm. \_\_\_\_\_

**NOTE**

One SFP Cooling pump may be temporarily stopped for the following conditions:

- To aid visibility during fuel assembly placement in regions of high flow turbulence.
- To permit electrical train swapping.

7. If a Total Core Off-Load is in progress and the reactor has been subcritical for less than 550 hours, Then ensure the following:

A. Two Spent Fuel Pool cooling pumps are in operation. \_\_\_\_\_

\*Satisfactory performance of the above asterisked steps assures conformance with applicable Technical Specifications.

REVISION NO.: 22	PROCEDURE TITLE: REFUELING SEQUENCING GUIDELINES	PAGE: 22 of 90
PROCEDURE NO.: 1-GOP-365	ST. LUCIE UNIT 1	

**APPENDIX A**  
**SURVEILLANCES PERFORMED DURING REFUELING**

**CHECK SHEET #1**  
**Surveillances Performed Prior To Commencing Refueling Operations**  
(Page 3 of 9)

2.	(continued)	<u>DATE / TIME / INITIAL</u>
	D. The average length of the three most recently completed fuel cycles (e.g., Cycles 17, 18, and 19 at EOC 19 conditions) shall be $\leq 13200$ effective full power hours (EFPH).	<p align="center">____/____/____ Eng.</p>
	E. DETERMINE when the core offload may begin by SELECTING <b>ONE</b> of the following:	
	1. <u>If</u> the decay heat generation rate for all previously discharged fuel (currently stored in the Unit 1 Fuel Pool) does NOT exceed 4.5E6 BTU/hr <u>and</u> the temperature of CCW inlet flow to the Fuel Pool Heat exchanger is $\leq 95^{\circ}\text{F}$ , <u>Then</u> transfer of irradiated fuel from the core to the Unit 1 Spent Fuel Storage Racks may BEGIN 145 hours after reactor shutdown.	<p align="center">____/____/____</p>
	OR	
	2. <u>If</u> the temperature of CCW inlet flow to the Fuel Pool Heat Exchanger is $> 95^{\circ}\text{F}$ <u>and</u> the decay heat generation rate for all previously discharged fuel (currently stored in the Unit 1 Fuel Pool) does NOT exceed 4.0 E6 BTU/hr, <u>Then</u> transfer of irradiated fuel from the core to the Unit 1 Spent Fuel Storage Racks may BEGIN 168 hours after reactor shutdown.	<p align="center">____/____/____</p>
	OR	
	3. <u>If</u> neither of the above conditions are met, <u>Then</u> transfer of irradiated fuel from the core to the Unit 1 Spent Fuel Storage Racks may BEGIN 185 hours after reactor shutdown.	<p align="center">____/____/____</p>

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>2</u>
	K/A #	<u>2.1.20</u>	_____
	Importance Rating	_____	<u>4.6</u>

072 / Area Radiation Monitoring: Ability to interpret and execute procedure steps.

Proposed Question: SRO 93

Unit 1 is performing a resin discharge from an ion exchanger to the spent resin tank. During the resin transfer, an Area Radiation monitor RE-26-20, N wall of VCT hallway, goes into HIGH-HIGH alarm. The Control Room has determined it to be a valid alarm.

Which of the following actions should be taken for this alarm?

- A. Inform the Control Room this is an expected alarm for the resin transfer.
- B. Direct HP to perform a survey of the area to determine if the resin transfer was the cause of the HIGH-HIGH alarm.
- C. Announce evacuation of the affected area.
- D. Stop the resin transfer and flush the transfer piping until radiation levels equal background level.

Proposed Answer: C

Explanation (Optional):

- A. This would be acceptable per procedure IF ARM was in area of spent resin piping discharge.
- B. VCT hallway ARM would not be affected by resin transfer.
- C. Correct, unexpected alarm not related to resin transfer
- D. This is performed after resin transfer. Transfer piping does not enter the VCT area.

Technical Reference(s): 1-ONP-26.01 Area Radiation Monitors (Attach if not previously provided)  
1-0520020 Radioactive Resin Replacement

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Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702861-8 (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:

5/10/93

REVISION NO.: 2A	PROCEDURE TITLE: AREA RADIATION MONITORS	PAGE: 13 of 16
PROCEDURE NO.: 1-ONP-26.02	ST. LUCIE UNIT 1	

**4.3** Local Area Radiation Monitors

**INSTRUCTIONS**

1. VERIFY the alarm is valid:
  - A. VERIFY the blue FAIL SAFE light is LIT, indicating power available and no component failures.
  - B. CHECK the meter of the affected monitor to verify alarm conditions exist.
  - C. PERFORM the following to verify the HIGH ALARM and/or HIGH-HIGH ALARM setpoint:
    1. PLACE the function selector switch to ALARM SET.
    2. If verifying the HIGH ALARM setpoint, Then PERFORM the following:
      - a. PRESS the amber HIGH ALARM pushbutton.
      - b. CHECK meter indication for correct setpoint.

**CONTINGENCY ACTIONS**

- 1.1 If at least **ONE** of the following conditions exists:
  - FAIL SAFE light is NOT LIT
  - Meter indication does NOT indicate an alarm condition exists

**Then GO TO Appendix A, Inoperable Monitor.**

REVISION NO.: 2A	PROCEDURE TITLE: AREA RADIATION MONITORS	PAGE: 14 of 16
PROCEDURE NO.: 1-ONP-26.02	ST. LUCIE UNIT 1	

**4.3** Local Area Radiation Monitors (continued)

1. C. (continued)

**INSTRUCTIONS**

**CONTINGENCY ACTIONS**

3. If verifying the HIGH-HIGH ALARM setpoint, Then PERFORM the following:

- a. PRESS the red HIGH-HIGH ALARM pushbutton.
- b. CHECK meter indication for correct setpoint.

4. PLACE the function selector switch to OPERATE.

2. If the alarm is valid, Then PERFORM the following:

- A. ANNOUNCE evacuation of the affected area over the plant page.
- B. NOTIFY Health Physics to perform applicable surveys.
- C. ATTEMPT to identify and isolate the source of increased activity.
- D. REFER to EPIP-00, Discovery & Identification of an Emergency Condition (Including Chemical, Fire and Natural Emergencies).

**END OF SECTION 4.3**

REVISION NO.: 58	PROCEDURE TITLE: RADIOACTIVE RESIN REPLACEMENT	PAGE: 15 of 191
PROCEDURE NO.: 1-0520020	ST. LUCIE UNIT 1	

**8.2 Resin Discharge from an Ion Exchanger / SRT to an Outside Shipping Container**

INITIAL

**NOTE**

Steps in this section can be performed in any order at the discretion of the SRO overseeing the evolution.

1. Health Physics has performed a radiation survey to determine the radiation level of the ion exchanger / SRT to be discharged. \_\_\_\_\_
2. Health Physics has completed the RWP requirements. \_\_\_\_\_
3. Inform the Control Room that RM-26-18, Ion Exchanger Valve Area, and RE-26-19, Drumming Station Area, may go into alarm both locally and in the Control Room due to anticipated high dose rates in these areas during the performance of this evolution. \_\_\_\_\_
4. If recommended by Chemistry Department, Then Verify 2 drums (10 cubic feet) of resin have been added to liner for dewatering filtration. \_\_\_\_\_
5. Maintenance has attached the resin liner fill head to the shipping container and moved the container to a position designated by Health Physics. \_\_\_\_\_
6. Verify that the outside shipping container is installed in its proper location with sufficient capacity to accept the resin discharge.  
US/NWE/SRO \_\_\_\_\_

**NOTE**

Portable filters may be used with the Chem Nuc drying system. The Pac Nuc drying system has no filters.

7. Verify dewatering hose properly installed between shipping container, portable pump, portable filters (if required by chemistry or HP), and properly secured into RAB floor drain.  
US/NWE/SRO \_\_\_\_\_
8. If 1A EDT Pump is going to be used to pump down the 1A EDT, Then ensure the 1A EDT Pump is aligned to automatically pump to the Unit 1 AWST in accordance with OP 1-0510020, Oxygenated Waste System. \_\_\_\_\_

REVISION NO.: 29	PROCEDURE TITLE: POST MAINTENANCE TESTING	PAGE: 132 of 137
PROCEDURE NO.: ADM-78.01	ST. LUCIE PLANT	

**TABLE 5**  
**LIST OF UNIT 1 RADIATION MONITORS**  
(Page 1 of 2)

Tag No.	Type	Safety	Location (RM-80)	Matrix Guide Appendix C
RE-26-1	Area	No	CR, Rear Cab. "D"	Area Mon
RE-26-2	Area	No	Refuel Stairs, Door 169N	Area Mon
RE-26-3	Area	Yes	CTMT, 0 deg. 90' elev.	Area Mon
RE-26-4	Area	Yes	CTMT, 270 deg. 90' elev.	Area Mon
RE-26-5	Area	Yes	CTMT, 180 deg. 90' elev.	Area Mon
RE-26-6	Area	Yes	CTMT, 90 deg. 90' elev.	Area Mon
RE-26-7	Area	No	Fuel Pool, N. wall center	Area Mon
RE-26-8	Area	No	Fuel Pool, N. wall center	Area Mon
RE-26-9	Area	No	Door 169.24' N	Area Mon
RE-26-10	Area	No	Mid of EW hallway, S. wall	Area Mon
RE-26-11	Area	No	SW Sect. of EW hallway, locked	Area Mon
RE-26-12	Area	No	SW sect. of EW hallway, locked	Area Mon
RE-26-13	Area	No	NW end of EW hallway, locked	Area Mon
RE-26-14	Area	No	1B ent. on pillar	Area Mon
RE-26-15	Area	No	RAB - 5' across from 1A HU drain pp	Area Mon
RE-26-16	Area	No	MG room, left of sample room	Area Mon
RE-26-17	Area	No	East side, NS hallway by Do2 cage	Area Mon
RE-26-18	Area	No	Valve Gallery, W wall	Area Mon
RE-26-19	Area	No	S exit on EW hallway	Area Mon
RE-26-20	Area	No	N wall of VCT hallway	Area Mon
RE-26-21	Area	No	E end of EW hallway	Area Mon
RE-26-22	Area	No	RAB 19.5' W wall	Area Mon
RE-26-23	Area	No	S wall of decon room	Area Mon
RE-26-24	Area	No	HVAC rm, RA2 pillar	Area Mon
RE-26-25	Area	No	NW corner of EW hallway	Area Mon
RE-26-26	Area	No	W wall of VCT hallway	Area Mon
RE-26-27	Area	No	VCT hallway, to letdown	Area Mon
RE-26-36	Area	No	RAB 62', on Elev. wall	Area Mon
RE-26-37	Area	No	NFB 48' west wall	Area Mon
RE-26-38	Area	No	NW Corner of EW hallway	Area Mon
RE-26-39	Area	No	RAB 19.5', near 1A BA conc.	Area Mon

REVISION NO.: 58	PROCEDURE TITLE: RADIOACTIVE RESIN REPLACEMENT	PAGE: 6 of 191
PROCEDURE NO.: 1-0520020	ST. LUCIE UNIT 1	
<p><b>4.18</b> ¶<sub>2</sub> The following valves are locked closed to provide an isolation boundary for the Drumming Station, which has been abandoned in place. If these valves are opened the requirements of Safety Evaluation PSL-ENG-SENS-98-046, Rev 1, will be violated.</p> <ul style="list-style-type: none"> <li>• V6446, BA Holding Pump Disch to Drumming Station Isol</li> <li>• V18678, IA to V6959Y, Waste Conc Cooler to Drumming Station Cntl Vlv</li> <li>• V6695, Volume Tank to Various Tanks Top Isol</li> <li>• V6696, Volume Tank to Various Tanks Bottom Isol</li> <li>• V15383, PMW to Drumming Station</li> <li>• V15672, SW to Drumming Station</li> </ul> <p><b>4.19</b> ¶<sub>6</sub> The Total Resin Volume in CVCS ion exchangers containing PRC-01 (PEX) should be &lt; 36.2 ft<sup>3</sup>.</p> <p><b>4.20</b> ¶<sub>6</sub> Chemistry personnel shall be present when PRC-01 (PEX) resin is loaded into an ion exchanger.</p> <p><b>4.21</b> PRC-01 (PEX) resin shall NOT be discharged to an empty Spent Resin Tank.</p> <p><b>4.22</b> Prior to loading an IX with fresh resin a discharge verification shall be performed by either Volumetric or boroscope method.</p> <p><b>4.23</b> This procedure contains many sections, any of which can be performed. While it is not necessary to complete all parts of the procedure based upon the resin being replaced, each portion of the Appendix for a specific Ion Exchanger should be performed in the order specified.</p> <p><b>4.24</b> Unexpected dose rates may be experienced due to possible cross leakage between ion exchangers. This condition should be considered prior to entering ion exchanger rooms.</p> <p><b>5.0</b> RELATED SYSTEM STATUS</p> <p><b>5.1</b> Reactor Makeup Water (RMW) System is available.</p> <p><b>5.2</b> Instrument Air System available.</p> <p><b>5.3</b> Vent Gas Collection Header (VGCH) in service.</p> <p><b>5.4</b> Discharge Drain Collection Header (DDCH) available.</p> <p><b>5.5</b> Area Monitoring System in service.</p>		

REVISION NO.: 58	PROCEDURE TITLE: RADIOACTIVE RESIN REPLACEMENT	PAGE: 4 of 191
PROCEDURE NO.: 1-0520020	ST. LUCIE UNIT 1	
<b>1.0</b>	<b>TITLE</b>  RADIOACTIVE RESIN REPLACEMENT	
<b>2.0</b>	<b>REVIEW AND APPROVAL</b>  See cover page	<i>WOP 26.02</i>
<b>3.0</b>	<b>PURPOSE</b>	
<b>3.1</b>	This procedure provides instructions for the discharge, discharge verification and replacement of radioactive resins in the following ion exchangers: Pre-concentrator, BA condensate, waste, fuel pool, purification, and deborating. It also provides instructions for discharging the spent resin tank (SRT) and ion exchanger resins to an outside shipping container.	
<b>4.0</b>	<b>LIMITS AND PRECAUTIONS</b>	
<b>4.1</b>	A Unit Supervisor (US), Nuclear Watch Engineer (NWE) or Senior Reactor Operator (SRO) should coordinate and supervise, in the field, each resin transfer operation.	
<b>4.2</b>	Either the US, NWE or SRO with a minimum of two Senior Nuclear Plant Operators (SNPO) must be present when the actual resin transfer takes place. Proper communication via radio should be maintained at all times between the Operations Department and Health Physics staff controlling the transfer.	
<b>4.3</b>	The Chemistry Department is responsible to notify Operations when an ion exchanger (IX) or the SRT should be discharged and also of the type and mix of resin to be used in refilling the ion exchanger.	
<b>4.4</b>	The Health Physics and Chemistry Supervisors shall be responsible for maintaining the inventory of spent resins in the SRT and shipping containers.	
<b>4.5</b>	Do not exceed system design pressure of 150 psig and SRT pressure of 45 psig.	
<b>4.6</b>	When spent resins are to be discharged to an outside shipping container, ensure cask liner and hoses have been leak checked prior to transfer of resin. Ensure that the transfer hoses are attached to the proper inlet and outlet connections on the shipping container.	
<b>4.7</b>	Health Physics will ensure all applicable radiation protection measures are observed.	
<b>4.8</b>	Notify Control Room prior to commencing resin flush.	

REVISION NO.: 58	PROCEDURE TITLE: RADIOACTIVE RESIN REPLACEMENT	PAGE: 9 of 191
PROCEDURE NO.: 1-0520020	ST. LUCIE UNIT 1	

**8.0 INSTRUCTIONS**

INITIAL

**8.1 Resin Discharge from an Ion Exchanger (IX) to the Spent Resin Tank (SRT)**

**NOTE**

- Steps in this section can be performed in any order at the discretion of the SRO overseeing the evolution.
- Before dumping any resin to the SRT (Spent Resin Tank), a tank level SHOULD be verified of the SRT for sufficient room by using a Boroscope. This may be accomplished by disassembly of SRT inlet valve and assisted by SCE and / or M/M.

1. Health Physics has performed a radiation survey to determine the radiation level of the IX to be discharged. \_\_\_\_\_
2. Health Physics has completed the RWP requirements. \_\_\_\_\_
3. Inform the Control Room that RM-26-18, Ion Exchanger Valve Area, and RE-26-19, Drumming Station Area, may go into alarm both locally and in the Control Room due to anticipated high dose rates in these areas during the performance of this evolution. \_\_\_\_\_
4. Notify Health Physics to install a liquid catch device at the outside shipping container pipe connections. \_\_\_\_\_
5. Contact the Chemistry Supervisor to determine if sufficient space is available in the SRT to receive the IX resin. \_\_\_\_\_
6. Ensure PRC-01 (PEX) resin will NOT be discharged to an empty Spent Resin Tank. \_\_\_\_\_
7. Drain the SRT as follows:

**CAUTION**

If V6712, SRT Drain, is opened too much, the floor drains on the -9 ft in the ECCS rooms and the East end of the -0.5 ft elevation can sometimes overflow. The potential for overflowing the floor drains is greatest when the SRT is pressurized.

- A. Throttle OPEN Approximately 1 turn V6712, SRT Drain. \_\_\_\_\_
- B. ¶<sub>1</sub> Continuously monitor the area floor drains for overflow. \_\_\_\_\_

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>3</u>
	Group #	_____	<u>Cat.1</u>
	K/A #	<u>2.1.7</u>	_____
	Importance Rating	_____	<u>4.7</u>

Conduct of Operation: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

Proposed Question: SRO 94

Unit 2 at 100% power when an inadvertent CIAS actuation occurs on Channel A.

- 1) As a result of this inadvertent CIAS, which of the following will cause an automatic Reactor trip? (Assume NO operator actions have been performed)
- 2) What would be the appropriate EOP procedure implementation after 2-EOP-01 Standard Post Trip Actions?
  - A. 1) Low Steam Generator level  
2) Implement 2-EOP-02 Reactor Trip Recovery
  - B. 1) TMLP  
2) Implement 2-EOP-15 Functional Recovery
  - C. 1) Pressurizer Pressure High  
2) Implement 2-EOP-02 Reactor Trip Recovery
  - D. 1) RCP CCW Flow Low  
2) Implement 2-EOP-09 LOOP/LOFC

Proposed Answer: D

Explanation (Optional):

- A. Feedwater Reg. valves fail 'Locked Up' or "as is"
- B. No CIAS valve position changes will cause RCS pressure to lower
- C. Pressure will rise due to loss of letdown and continuation of Charging, however Pressurizer pressure control system will control pressure.
- D. Correct: Loss of Instrument air to containment, HCV-18-1 would fail closed CCW valves to RCP's in Containment. 10 minute automatic trip on Unit 2 only. After trip, Operators are required to stop all RCP's.

Technical Reference(s): 2-EOP-99 Table 2 (Attach if not previously provided)  
 2-EOP-09 LOOP/LOFC  
 2-0120034 Reactor Coolant  
 Pump

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Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702822-10 (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:

52094

REVISION NO.: 32B	PROCEDURE TITLE: REACTOR COOLANT PUMP	PAGE: 26 of 33
PROCEDURE NO.: 2-0120034	ST. LUCIE UNIT 2	

**6.5 RCP CCW Problems/Anomalies (continued)**

**INSTRUCTIONS**

**CONTINGENCY ACTIONS**

<b>NOTE</b>
<ul style="list-style-type: none"> <li>• With SIAS, the containment instrument air supply valve will have to be Overridden OPEN to restore air to RCP CCW valves.</li> <li>• Resetting the SIAS will CLOSE any CCW "N" Hdr Isol Vlvs that were Overridden Open. These valves control switches must be placed in CLOSE and then back to OPEN to restore them to OPEN.</li> </ul>

2. If RCP low cooling water flow is indicated, Then:

A. VERIFY non-essential ("N") header valves and CCW containment isolation valves are OPEN:

1. Non-essential header valves:
  - HCV-14-8A, "N" Hdr Isol
  - HCV-14-8B, "N" Hdr Isol
  - HCV-14-9, "N" Hdr Isol
  - HCV-14-10, "N" Hdr Isol
2. Containment isolation valves:
  - HCV-14-1, CCW To RC Pump
  - HCV-14-2, CCW From RC Pump
  - HCV-14-6, CCW From RC Pump
  - HCV-14-7, CCW To RC Pump

A.1. If "N" header valves and/or CCW containment isolation valves were closed by a SIAS, Then PERFORM the following:

1. ENSURE no excess CCW leakage is indicated.
2. PLACE the "N" Hdr Isol Vlv control switches in CLOSE then to OVERRIDE to Open any SIAS-closed "N" Hdr Vlvs.
3. PLACE the CCW to RC Pump containment isolation valves to OPEN-RESET to override and Open the RCP CCW valves.

A.2. If "N" header valves and/or CCW containment isolation valves were closed by other than a SIAS, Then OPEN any closed "N" header or containment isolation CCW valve(s).

REVISION NO.: 32B	PROCEDURE TITLE: REACTOR COOLANT PUMP	PAGE: 27 of 33
PROCEDURE NO.: 2-0120034	ST. LUCIE UNIT 2	

**6.5 RCP CCW Problems/Anomalies (continued)**

**INSTRUCTIONS**

**CONTINGENCY ACTIONS**

**NOTE**

Annunciator R-8, SIAS Channel A/B Actuation Block Permissive, alarms at a setpoint of 1836 psia.

3. ¶<sub>1</sub> \* If CCW flow is lost and can NOT be reestablished to the RCPs within 10 minutes, Then:
  - A. If CEA TCBs are CLOSED, Then
    1. TRIP the reactor
    2. TRIP the turbine
  - B. STOP all 4 RCPs.
  
4. \* If a RCP has been Stopped while in Hot Standby or Mode 1 conditions and a reactor plant cooldown is not to be performed, Then DEPRESSURIZE the RCS to between **1800 psia to 1850 psia** to maintain RCP lower seal cavity temperature less than 300°F.
  
5. ¶<sub>1</sub> If CCW flow is lost and can NOT be reestablished to the RCPs within 30 minutes, Then ISOLATE RCP CBO as follows:
  - A. CLOSE V2505, RCP Bleedoff Cntmt Isol.
  - B. CLOSE V2524, RCP Bleedoff Cntmt Isol.
  - C. ENSURE V2507, RCP Bleedoff Relief Stop Vlv, is CLOSED.
  
6. ¶<sub>5</sub> If CCW flow is lost and controlled bleedoff flow is isolated, Then BEGIN natural circ cooldown in accordance with ONP 2-0120039 within 4 hours.

REVISION NO.: 15	PROCEDURE TITLE: LOSS OF OFFSITE POWER/LOSS OF FORCED CIRCULATION ST. LUCIE UNIT 2	PAGE: 4 of 27
PROCEDURE NO.: 2-EOP-09		

## 2.0 ENTRY CONDITIONS

2.1 **BOTH** of the following conditions exist,

1. **ANY** of the following have occurred:

- 2-EOP-01, Standard Post Trip Actions, have been performed
- The event initiated from Mode 3  
and SIAS has NOT been blocked
- A Station Blackout (SBO) event has occurred  
and at least **ONE** Vital 4.16 KV bus has power restored from a Unit 2 source

2. Plant conditions indicate that a LOOP/LOFC has occurred;  
**ANY** of the following may be present:

- Transformer alarms
- Breaker alarms
- EDGs automatically starting
- RCP trouble alarms
- Condenser vacuum alarms
- Low RCS flow indications

REVISION NO.: 35	PROCEDURE TITLE: APPENDICES / FIGURES / TABLES / DATA SHEETS ST. LUCIE UNIT 2	PAGE: 136 of 156
PROCEDURE NO.: 2-EOP-99		

**TABLE 2**  
**CONTAINMENT ISOLATION ACTUATION SIGNAL**  
(Page 1 of 5)

<b>Section 1: RTGB-206</b>	<u>A Train</u> (√)	<u>B Train</u> (√)
<input type="checkbox"/> 1. ENSURE SIT Sample Valves CLOSED.		
• I-SE-05-1E	—	
• I-SE-05-1A/1B/1C/1D (four valves on one light)		—
<input type="checkbox"/> 2. ENSURE SI to RWT / VCT Valves CLOSED.		
• I-SE-03-2A	—	
• I-SE-03-2B		—
<input type="checkbox"/> 3. ENSURE RCS and Pressurizer Sample Valves CLOSED.		
• V5200	—	
• V5201	—	
• V5202	—	
• V5203		—
• V5204		—
• V5205		—
<input type="checkbox"/> 4. ENSURE S/G 2A and S/G 2B Blowdown Valves CLOSED.		
• FCV-23-3	—	
• FCV-23-5	—	
<input type="checkbox"/> 5. ENSURE S/G Blowdown Sample Valves CLOSED. (two valves on one light)		
• FCV-23-7/9	—	

REVISION NO.: 35	PROCEDURE TITLE: APPENDICES / FIGURES / TABLES / DATA SHEETS ST. LUCIE UNIT 2	PAGE: 137 of 156
PROCEDURE NO.: 2-EOP-99		

**TABLE 2**  
**CONTAINMENT ISOLATION ACTUATION SIGNAL**  
(Page 2 of 5)

<b>Section 1: RTGB-206 (continued)</b>	<u>A Train</u> (√)	<u>B Train</u> (√)
<input type="checkbox"/> <b>6.</b> ENSURE Containment Sample Valves CLOSED. (three valves on one light)		
• FCV-26-2/4/6	—	
• FCV-26-1/3/5		—
<input type="checkbox"/> <b>7.</b> ENSURE Instrument Air to Containment Valve CLOSED.		
• HCV-18-1	—	
<input type="checkbox"/> <b>8.</b> ENSURE Primary Water to Containment Isol. Valve CLOSED.		
• HCV-15-1		—

**End of Section 1**

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**TABLE 2**  
**CONTAINMENT ISOLATION ACTUATION SIGNAL**  
(Page 3 of 5)

<b>Section 2: RTGB-205</b>	<u>A Train</u> (√)	<u>B Train</u> (√)
<input type="checkbox"/> 1. ENSURE RCP Bleed-off Valves CLOSED.		
• V2505	—	
• V2524		—
<input type="checkbox"/> 2. ENSURE Reactor Cavity Sump Valves CLOSED.		
• LCV-07-11A	—	
• LCV-07-11B		—
<input type="checkbox"/> 3. ENSURE Waste Gas Valves CLOSED.		
• V6750	—	
• V6718		—
<input type="checkbox"/> 4. ENSURE Reactor Drain Tank Valves CLOSED.		
• V6341	—	
• V6342		—
<input type="checkbox"/> 5. ENSURE Nitrogen Header Containment Isol. Valve CLOSED.		
• V6741		—
<input type="checkbox"/> 6. ENSURE Letdown Isol. Valves CLOSED.		
• V2516	—	
• V2522		—

**End of Section 2**

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**TABLE 2**  
**CONTAINMENT ISOLATION ACTUATION SIGNAL**  
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<b>Section 3: HVCB Panel</b>	<u>A Train</u> (√)	<u>B Train</u> (√)
<input type="checkbox"/> <b>1. ENSURE Control Room Emergency Filter Fans RUNNING.</b>		
• HVE-13A	—	
• HVE-13B		—
<input type="checkbox"/> <b>2. ENSURE Control Room Isol. Valves CLOSED.</b>		
• FCV-25-24	—	
• FCV-25-17	—	
• FCV-25-16	—	
• FCV-25-18	—	
• FCV-25-25		—
• FCV-25-14		—
• FCV-25-15		—
• FCV-25-19		—
<input type="checkbox"/> <b>3. VERIFY Emerg. Filter Fan HVE-13A and 13B Inlet Dampers OPEN.</b>		
• D-17A	—	
• D-18	—	
• D-17B		—
• D-19		—

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**TABLE 2**  
**CONTAINMENT ISOLATION ACTUATION SIGNAL**  
(Page 5 of 5)

Section 3: HVCB Panel (continued)	<u>A Train</u> (√)	<u>B Train</u> (√)
<input type="checkbox"/> 4. ENSURE SBVS Isolation Vlvs OPEN.		
• FCV-25-32	—	
• FCV-25-33		—
<input type="checkbox"/> 5. ENSURE Fuel Handling Emerg. Vent Valves CLOSED.		
• FCV-25-30	—	
• FCV-25-31		—
<input type="checkbox"/> 6. ENSURE SBVS Exhaust Fans RUNNING.		
• HVE-6A	—	
• HVE-6B		—
<input type="checkbox"/> 7. ENSURE Station Air Isolation Valve to Containment is CLOSED.		
• HCV-18-2	—	
<input type="checkbox"/> 8. ENSURE Continuous Cont. Purge Makeup / Isol. Vlvs CLOSED.		
• FCV-25-26	—	
• FCV-25-20	—	
• FCV-25-36		—
• FCV-25-21		—

**End of Section 3**

**END OF TABLE 2**

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>3</u>
	Group #	_____	<u>Cat. 1</u>
	K/A #	<u>2.1.34</u>	_____
	Importance Rating	_____	<u>3.5</u>

Conduct of Operations: Knowledge of primary and secondary plant chemistry limits.

Proposed Question: SRO 95

Unit 1 is at 100% power when Chemistry reports that secondary chemistry sodium has increased to Action Level 2. The crew has entered 1-0610030 Secondary Chemistry – Off Normal.

3 hours later, the Unit is at 45% when Chemistry reports the cause has been found and corrected. Sodium is now at Action level 1 values.

Which of the following is required for the above conditions?

- A. Continue the downpower to 28% - 32%.
- B. Continue the downpower until the Unit is offline.
- C. Stabilize power at the current value.
- D. Return the Unit to full power.

Proposed Answer: C

Explanation (Optional):

- A. Downpower can be stopped if lower Action Level reached
- B. This is Action level 3 criteria
- C. Correct
- D. Must be BELOW Action level 1 criteria to return to full power

Technical Reference(s): 1-0610030 Secondary Chemistry – Off Normal (Attach if not previously provided)

\_\_\_\_\_

\_\_\_\_\_

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702860-08 (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:

SEP 95



**FPL**

# ST. LUCIE UNIT 1

## OFF NORMAL OPERATING PROCEDURE

QUALITY RELATED  
REFERENCE USE

Procedure No.

**1-0610030**

Current Revision No.

**23A**

Effective Date

**08/15/06**

**FOR INFORMATION ONLY**  
 Before use, verify revision and change documentation  
 (if applicable) with a controlled index or document.  
 DATE VERIFIED \_\_\_\_\_ INITIAL \_\_\_\_\_

Title:

## SECONDARY CHEMISTRY – OFF NORMAL

Responsible Department: **OPERATIONS**

### REVISION SUMMARY:

**Revision 23A** - Incorporated PCR 06-1864 to replace references to 0700026 with NOP-19.01. (Spencer Patterson, 07/18/06)

**Revision 23** – Incorporated PCR 06-1214 for CR 2006-1789 to add steps to reduce spread of contamination during seawater intrusion. (04/20/06)

AND

Incorporated PCR 06-0922 to add guidance to rapidly shutdown a circulating water pump if the associated waterbox is causing rapidly degrading secondary chemistry due to a tube leak. (Spencer Patterson, 04/18/06)

**Revision 22** – Incorporated PCR 05-3226 to add new Rev. 6 of EPRI PWR Secondary Water Chemistry Guidelines which changes Action Level 2 and 3 Actions. (Jeff Heinold, 10/13/05)

**Revision 21A** – Incorporated PCR 04-0777 to redesignate procedure as Quality Related. (J. S. Napier, 03/03/04)

**Revision 21** - Incorporated PCR 03-3616 to incorporate changes made to COP-05.04 associated with actions required if condensate dissolved oxygen levels are exceeded. (Mike Bladek, 12/29/03)

**Revision 20** - Added step to monitor condenser vacuum and air in-leakage once circ. water pump is secured and enter loss of vacuum off-normal, if necessary. (K. Korth, 03/15/02)

Revision <u>0</u>	FRG Review Date <u>12/12/83</u>	Approved By <u>J. H. Barrow (for)</u> Plant General Manager	Approval Date <u>01/28/84</u>	S_1_OPS DATE DOCT DOCN SYS COM ITM	PROCEDURE
Revision <u>23A</u>	FRG Review Date <u>04/20/06</u>	Approved By <u>Chris R. Costanzo</u> Plant General Manager N/A	Approval Date <u>04/20/06</u>		1-0610030
		Authorized Approver <u>R. Weller</u>	<u>07/18/06</u>	COMPLETED	
		Authorized Approver (Minor Correction)		23A	

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**1.0 TITLE**

SECONDARY CHEMISTRY – OFF NORMAL

**2.0 REVIEW AND APPROVAL**

See cover sheet.

**3.0 PURPOSE & DISCUSSION**

**3.1** This procedure provides instructions to be followed when contaminated water leakage occurs into the secondary system or when some other condition causes a secondary chemistry excursion.

**3.2** Condenser cooling water and contaminated makeup sources may contain solids and solid producing hardness salts. The development and implementation of the leak-isolation procedure is essential in safeguarding the chemical and physical integrity of the Steam Generators (S/G).

**3.3** A major chemistry concern in operating S/Gs is minimizing the input of cooling water contaminants, especially chloride (Cl<sup>-</sup>) and Sodium Na<sup>+</sup>, to the Steam Generators. These can concentrate to aggressive levels causing adverse chemistry conditions, particularly corrosion of carbon steel support plates, leading to denting of S/G tubes and intergranular attack/stress corrosion cracking (IGA/SCC) of the steam generator tubes. Aggressive levels can occur in relatively short periods of time during sea water leakage because of the large concentrating capability of the S/Gs.

For example, at 100% power a 2 gallons per minute (gpm) condenser tube leak will give a solids input of approximately .6 pounds (lbs)/minute into S/Gs, a condensate cation conductivity of approximately 12 micromho/centimeter (umho/cm), and an S/G conductivity of 100 umho/cm in approximately 20 minutes.

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**4.0 SYMPTOMS**

- 4.1** Increase in Cation conductivity in the condensate header.
- 4.2** 1A/1B SGBD specific conductivity increasing.
- 4.3** 1A/1B S/G cation conductivity increasing.
- 4.4** Hotwell quadrant cation conductivity increasing or alarming.
- 4.5** Increase in Dissolved Oxygen reading.
- 4.6** Increase or decrease in S/G or Feedwater pH.
- 4.7** Increase in sodium ion concentration.
- 4.8** Increase in air inleakage reading.

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**5.0 INSTRUCTIONS**

**5.1 Immediate Automatic Actions:**

1. Condensate cation conductivity alarm and/or hotwell quadrant cation conductivity alarm.
2. Condensate Sodium alarm and/or hotwell quadrant Sodium alarm.

**5.2 Immediate Operation Actions:**

1. None

**5.3 Subsequent Actions.**

1. If ALL of the following conditions exist:
  - This procedure has been entered due to rapidly degrading Secondary Chemistry as the result of a Condenser Tube Leak.
  - The source of leakage (affected Waterbox) is identified
  - Four Circulating Water Pumps are running.
  - It is desired to rapidly remove the associated Circulating Water Pump from service.

Then PERFORM **BOTH** of the following:

- A. **GO TO** 1-NOP-21.02, Circulating Water System Operation, Section 7.9, Rapid Shutdown of a Circulating Water Pump.
- B. CONTINUE to implement this procedure.
2. Stop any evolution or maintenance in progress which may be the cause of out-of-limit Chemistry and notify the Chemistry Department.
3. Establish maximum blowdown rates on both S/Gs and maintain normal line-up through filtration trains unless otherwise directed by Chemistry Department.
4. Place Condensate Polisher Filter Demineralizer System in service per NOP-19.01 as requested by Chemistry Department.

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**5.3** Subsequent Actions (continued)

**NOTE**

- Due to the operational complexities associated with meeting electrical demands and the potential for degrading equipment as a consequence of subjecting the plant to operational transients, the action levels specified herein should not be construed as absolute. By necessity, senior plant and corporate management must retain the flexibility to deviate from the time limits specified when in their judgement such deviations are warranted by the progress of the recovery, and would not be inconsistent with the stated objectives. If the decision to deviate from the time limit has been made, this fact will be conveyed to the affected units' Control Room by memo from the Operations Supervisor.
- **SECONDARY CHEMISTRY ACTION LEVELS:**  
Three action levels have been defined for taking remedial action when monitored parameters are observed and confirmed to be outside the normal operation value. Normal operating value as it is used here refers to the value of the parameter which is consistent with long-term system reliability. Action Level 1 is implemented whenever an out-of-normal value is detected. Action Level 2 is instituted when conditions exist which have been shown to result in some degree of steam generator corrosion during extended full (100%) power operation. Action Level 3 is implemented when conditions exist which will result in rapid steam generator corrosion and continued operation is not advisable.

5. Contact Chemistry and/or refer to COP-05.04, Chemistry Department Surveillances and Parameters, and classify the severity of the excursion as either Action Level 1, Action Level 2 or Action Level 3.
6. Initiate required actions specified for the appropriate Action Level:
  - For Action Level 1:  
Objective: To promptly identify and correct the cause of an out-of-Guideline value without power reduction.  
  
Required Actions:
    - For Condensate Dissolved Oxygen (D.O.) events, begin continuous monitoring of Feedwater D.O., ensure Feedwater Hydrazine is maintained greater than 8 times Condensate D.O. and ensure Feedwater D.O. is maintained  $\leq 5$  ppb. If Feedwater D.O. is  $> 5$  ppb, take appropriate Action Level actions.
    - Corrective actions should be implemented as soon as possible to return parameter to below Action Level 1.

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**5.3** Subsequent Actions (continued)

**6.** (continued)

- For Action Level 1: (continued)
  - If parameter is not within normal value range within one week following confirmation of excursion, go to Action Level 2 for those parameters having Action Level 2 values.
  - The lack of progressive action criteria for many parameters is not intended to imply that remaining outside the normal range is satisfactory. In these cases, other chemical parameters, specifically associated with known corrosion conditions, are utilized for control.
  - For those parameters not having an Action Level 2 value, an engineering justification should be performed for operating above Action Level 1 for an extended period of time.

- For Action Level 2:

Objective: To minimize corrosion by operating at reduced power while corrective actions are taken. Power reduction should be to a level which will reduce steam generator tube wall temperatures and impurity hideout rates while providing sufficient system flow to maintain automatic operation while the source of the impurity is eliminated. This reduced power level is typically approximately 30% of full power.

Required Actions:

- For all Action Level 2 excursions, excluding Loss of hydrazine feed and Condensate Dissolved Oxygen, take immediate actions to reduce power to 28% - 32% using 1-ONP-22.01 Rapid Downpower, at a rate of 10-15 MW/min. This will ensure power is reduced within 8 hours of entering Action Level 2 limits.
- In event of loss of hydrazine feed that is not restored within 8 hours, commence a plant shutdown to Mode 2 per 1-ONP-22.01, Rapid Downpower, at a rate of 10-15 MW/min. When Hydrazine has been restored, the unit may be restored to full power.

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**5.3** Subsequent Actions (continued)

**6.** (continued)

- For Action Level 2: (continued)

- For Condensate Dissolved Oxygen (D.O.) events, begin continuous monitoring of Feedwater D.O., ensure Feedwater Hydrazine is maintained greater than 8 times Condensate D.O. and ensure Feedwater D.O. is maintained  $\leq 5$  ppb. If Feedwater D.O. is  $> 5$  ppb, take appropriate Action Level actions.
- Power de-escalation can be terminated if the source of impurity ingress is eliminated and parameter values are below Action Level 2.
- Escalation to full power can be resumed once below Action Level 1 values.
- After an Action Level 2 excursion, excluding dissolved oxygen, consideration should be given to further reductions in power and a low power or hot soak to promote removal of the specific contaminant from the S/G. Contact Chemistry for further recommendations.
- Return parameter to below Action Level 1 value within 100 hours of exceeding an Action Level 2 value, or go to Action Level 3 for those parameters having Action Level 3 values.
- If Action Level 2 is entered as a result of being in Action Level 1 for more than a week, and the parameter concentration remains below the Action Level 2 values, operation at ~30% power may continue.

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**5.3** Subsequent Actions (continued)

**6.** (continued)

- For Action Level 3:

Objective: To correct a condition which is expected to result in rapid steam generator corrosion during continued operation. Plant shutdown will minimize ingress and eliminate further concentration of harmful impurities. Plant shutdown also will reduce further damage to the steam generator by allowing cleanup of the impurities as a result of hideout return.

Required Actions:

- SHUTDOWN to at least Mode 2 as quickly as safe plant operation permits regardless of the duration of the excursion in Action Level 3.
- The preferred method to shutdown is to perform 1-ONP-22.01, Rapid Downpower, using a load rated 10-15 MW/min.
- Remove the main turbine from service as soon as possible.
- After the turbine is off-line, then transfer from main feedwater to auxiliary feedwater as soon as possible.
- Cleanup steam generators by maximizing blowdown or drain and refill as appropriate until normal values are reached.
- Attempt to maintain the reactor critical above the point of adding heat to support maximum blowdown for steam generator cleanup.
- Clean up secondary water chemistry using the condensate polisher and/or feed and bleed and/or drain and refill as appropriate until normal chemistry values as determined by the chemistry department are obtained and the leak/source of the contaminant is eliminated.

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**5.3** Subsequent Actions (continued)

**6.** (continued)

- For Action Level 3: (continued)

- The judgment on maintaining the steam generator in a hot condition or progressing to cold shutdown should be based on the corrosion concern imposed by the specific impurity and the most rapid means to effect cleanup. Refer to the table below:

CONDITION / CAUSE	ACTION RECOMMENDATION
Cation conductivity >700 $\mu$ mho/cm due to cooling water intrusion	The conditions/causes will normally require the unit to reduce power to at least Mode 4 while the S/Gs are cleaned up.
Action Level 3 value exceeded due to intrusion of resin	Significant resin intrusion generally requires hydro lancing to remove the resin from the S/G.
Cation conductivity >4 but <700 $\mu$ mho/cm due to cooling water intrusion	This condition will normally require the unit to reduce power to at least Mode 2 while the steam generators are cleaned up.  Cleanup under hot shutdown conditions is permitted, however, the decision to stay hot or go cold should be based on evaluation and selection of the most effective way to cleanup and recover from the intrusion of contaminants.
Action Level 3 exceeded, source unknown or unknown contaminant	As a minimum this condition will normally require the unit to reduce power to at least Mode 2 while the steam generators are cleaned up.  Decision on clean up would be subject to case by case consideration.

- 7.** Manually override LCV-12-5 (Condensate reject valve) and close. Isolate reject regulating valve by closing one or more manual isolation valves. Monitor hotwell level closely.

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**5.3** Subsequent Actions (continued)

8. Establish location and source of inleakage using all available instrumentation. Sources of contamination could be from locations other than Main Condenser waterboxes such as:
  - A. Main Condenser hotwell drains.
  - B. Condensate Storage Tank (CST) into 1A1.
  - C. Monitor Storage Tank (MST) into 1B1.
  - D. Condensate Recovery Tank (concentrator) into 1B2.
  - E. Condenser Tubesheet Pressurization System.
  - F. Idle Condensate Pump started after extended standby status.
  - G. Gland seal recovery tank into 1A1.
  - H. Chemical Injection Tank.
9. Isolate inleakage/source when found and use redundant equipment or alternate means to provide plant support for equipment removed from service.
10. If inleakage is one or more Main Condenser waterboxes, Then perform the following:
  - A. Reduce power as appropriate for removal of affected waterboxes.

**CAUTION**

- Do NOT secure 2 (two) Circulating Water Pumps that share the same Condenser.
- Stopping both Circulating Water Pumps that share the same Condenser will result in differential pressure between Condensers that will exceed operating limits and subsequently will require Reactor/Turbine trip.
- Stopping both Circulating Water Pumps that share the same Condenser may result in Turbine Vacuum Low Trip.

- B. If it is desired to rapidly remove the associated Circulating Water Pump from service, Then PERFORM **BOTH** of the following:
  1. **GO TO** 1-NOP-21.02, Circulating Water System Operation, Section 7.9, Rapid Shutdown of a Circulating Water Pump.
  2. CONTINUE to implement this procedure.

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**5.3** Subsequent Actions (continued)

**10.** (continued)

- C.** Stop affected water Circulating Water Pump per 1-NOP-21.02, Circulating Water System Operation.
- D.** Monitor condenser vacuum and air in-leakage and if necessary, go to ONP 1-0610031, Loss of Condenser Vacuum.
- E.** PERFORM the following with Chemistry concurrence to prevent Unit-to-Unit cross contamination:
  - 1.** Secure Steam Generator blowdown flow to the MST's IAW 1-NOP-23.02.
  - 2.** Align Steam Generator blowdown flow to the discharge canal IAW 1-NOP-23.02.
  - 3.** Establish maximum blowdown rates to the discharge canal IAW 1-NOP-23.02.
  - 4.** Locally close vacuum drag on Unit #1 by closing V31189.
- F.** Isolate the Condensate Supply to the CST loop seal by closing V12171 (TGB/33/S-11/E-B).
  - 1.** Enter V12171 into deviation log for tracking purposes
- G.** Notify Chemistry NOT TO USE Condensate Water to Mix Chemicals due to saltwater intrusion.
- H.** STOP the heater drain PP's when permissible during downpower to reduce contamination in the secondary.
- I.** Notify Maintenance Department to prepare for waterbox entry and tube plugging.
- 11.** Monitor S/G and Condensate conductivity for a decreasing trend to ensure probable inleakage source has been isolated.
- 12.** Decrease contamination by drain and fill and/or feed and bleed methods or consider using condensate polisher.
- 13.** Declassify leak category as water chemistry improves and reduce action requirements appropriately.

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## 6.0 REFERENCES

### NOTE

One or more of the following symbols may be used in this procedure:

- § Indicates a Regulatory commitment made by Technical Specifications, Condition of License, Audit, LER, Bulletin, Operating Experience, License Renewal, etc. and shall NOT be revised without the required Focus review and appropriate approval.
- ¶ Indicates a management directive, vendor recommendation, plant practice or other non-regulatory commitment that should NOT be revised without consultation with the plant staff.
- Ψ Indicates a step that requires a sign off on an attachment.

6.1 FSAR Section 10.3

6.2 Chemistry Procedure COP-05.04.

6.3 INPO SER 20-90.

6.4 ABB Combustion Engineering Nuclear Steam Supply System Chemistry Manual, CENPD-28.

6.5 Electric Power Research Institute PWR Secondary Water Chemistry Guidelines.

6.6 Duolite Ion Exchange Manual.

6.7 1-NOP-21.02, Circulating Water System Operations

## 7.0 RECORDS REQUIRED

7.1 Normal log entries.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>3</u>
	Group #	_____	<u>Cat. 1</u>
	K/A #	<u>2.1.32</u>	_____
	Importance Rating	_____	<u>4.0</u>

Conduct of Operations: Ability to explain and apply system limits and precautions.

Proposed Question: SRO 96

Unit 1 is at 50% power steady state operation due to Main Feedwater problems.

- The 1A MFW Reg. valve is in manual.
- The RCO is having trouble controlling 1A SG level.
- He states he is increasing feedwater flow due to Narrow range level below setpoint (62% and increasing) and Wide range level stable (66% and remaining constant)

Which of the following directions would you give to the RCO and the reasons for those directions?

- Stop increasing feedwater flow. SG Wide range level leads Narrow range level.
- Continue increasing feedwater flow until Narrow range level reaches setpoint. Wide range level lags Narrow range level.
- Stop increasing feedwater flow. SG Wide range level is more accurate than Narrow range level.
- Continue increasing feedwater flow until Wide range level increases. SG Narrow range level lags Wide range level.

Proposed Answer: A

Explanation (Optional):

- Correct
- Wide range level LEADS Narrow range level
- Wide range is not more accurate
- Wide range level LEADS Narrow range level

Technical Reference(s): 1-GOP-201 Reactor Plant Startup-Mode 2 to Mode 1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702868-08 (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  2

Comments:

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- 4.5** §<sub>4</sub> Maintaining S/G levels at low power requires close monitoring. Several factors should be considered:
- When maintaining Reactor power with ADVs, Reactor power should be maintained less than 8%.
  - S/G blowdown may affect the ability to maintain S/G levels.
  - If controlling one ADV in automatic and one ADV in manual, attempt to maintain the manual ADV controller balanced with the automatic ADV controller.
  - Main Feedwater should be placed in service prior to 5% Reactor power.
- 4.6** A 1% change in S/G wide range level is approximately equal to a 5% change in S/G narrow range level.
- 4.7** S/G wide range level indication will **lead** narrow range level indication by approximately 30 seconds to 2 minutes as feedwater flow to the steam generator changes. Therefore, wide range level should be used as a predictor in determining the need for changes in feedwater flow while feedwater regulating valves and / or bypass valves are in **manual**. For example, if narrow range level is falling but wide range level is stable or increasing, **stop increasing** feedwater flow to the S/G and wait for narrow range level to turn around. If S/G narrow range level is used as the **only** level trend indication, an overfeed condition could occur, and a feedwater isolation and / or turbine trip on high S/G level is extremely likely.
- 4.8** Steam generator level control will be adversely effected by changes in steam generator pressure. For example if steam generator pressures are not stable due to fluctuations in SBCS operation, this will be seen in steam generator level perturbations.
- 4.9** Turbine bearing related temperatures should be adhered to as follows:
- Maximum bearing metal temperature (Turbine Trip Criteria) 225°F
  - Maximum bearing oil discharge temperature (Turbine Trip Criteria) 180°F
  - Normal bearing oil operating temperature 120°F
  - Minimum bearing oil temperature for turbine roll or turning gear operation 70°F
  - Minimum bearing oil temperature for any motor operated pump operation 50°F
- 4.10** ¶<sub>1</sub> Maximum Exhaust Hood differential between the low pressure turbines should not exceed 50°F.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		Cat. 2
	K/A #	2.2.14	
	Importance Rating		4.3

Equipment Control: Knowledge of the process for controlling equipment configuration or status.

Proposed Question: SRO 97

Unit 2 is at 100% power with the following:

- HVE-41A Intake Structure Ventilation fan must be removed from service due to a bad bearing.

Which of the following states 1) the status of the 2A ICW electrical train  
2) actions to be taken?

2A ICW electrical train is:

- 1) OPERABLE  
2) Verify operability of HVE-41B.
- 1) OPERABLE  
2) Monitor intake structure room to determine temperature can be maintained <120°F during expected daily peak temperature.
- 1) INOPERABLE BUT available  
2) Install temporary ventilation. When temporary ventilation installed, AND If peak intake structure room temperature verified <120°F, declare 2A ICW electrical train operable.
- 1) INOPERABLE  
2) Monitor intake structure room to determine temperature can be maintained <120°F during expected daily peak temperature. If peak temperature verified <120°F, declare 2A ICW electrical train operable.

Proposed Answer: D

Explanation (Optional):

- A. Must declare 2A inoperable until room temperature determined can be monitored and verified <120°F.
- B. Must declare 2A inoperable until room temperature determined can be monitored and verified <120°F.
- C. Must declare 2A inoperable until room temperature determined can be monitored and verified <120°F.
- D. Correct

Technical Reference(s): 2-NOP-25.09 Miscellaneous Ventilation Systems (Attach if not previously provided)

\_\_\_\_\_

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_

Modified Bank # 1566 (Note changes or attach parent)

(attached)

New \_\_\_\_\_

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 3

Comments:



REVISION NO.: 5	PROCEDURE TITLE: MISCELLANEOUS VENTILATION SYSTEMS	PAGE: 14 of 14
PROCEDURE NO.: 2-NOP-25.09	ST. LUCIE UNIT 2	

**APPENDIX A**  
**INTAKE STRUCTURE ROOM TEMPERATURE DEMONSTRATION**  
(Page 2 of 2)

INITIAL

3. (continued)

C. If pump operating conditions degrade and temperatures are expected to exceed 120°F, Then PERFORM the following:

1. RESTART **ALL** available fans. \_\_\_\_\_

2. TERMINATE the demonstration as unsatisfactory. \_\_\_\_\_

D. When the demonstration is complete, Then RESTART required fans:

• HVE-41A \_\_\_\_\_

• HVE-41B \_\_\_\_\_

Results of this demonstration have been reviewed. Based on this review, the Intake Structure room temperature can be maintained less than 120°F during the expected daily peak temperature with fans NOT operating.

SAT     UNSAT

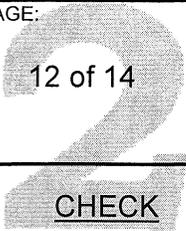
I have reviewed the requirements of this procedure including other surveillances performed during this procedure, if any (i.e., datasheet(s), PMT sheet(s), etc.). Any deviations, abnormal results, equipment problems, failures, or human performance issues must be documented via a condition report for each individual item.

C.R. #: \_\_\_\_\_

Reviewed By: \_\_\_\_\_ Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_  
SM/US

**END OF APPENDIX A**

REVISION NO.: 5	PROCEDURE TITLE: MISCELLANEOUS VENTILATION SYSTEMS	PAGE: 12 of 14
PROCEDURE NO.: 2-NOP-25.09	ST. LUCIE UNIT 2	



**7.1 Inoperable or Out of Service Intake Structure Exhaust Fans**

2. §1 If either HVE-41A or HVE-41B is declared inoperable (Modes 1 through 4), Then PERFORM the following:

**NOTE**

Credit can NOT be taken for temporary ventilation equipment removing room heat loads to support electrical train ICW train operability.

- A. DECLARE the respective electrical train ICW train inoperable (Tech Spec 3.7.4). \_\_\_\_\_
- B. PERFORM Appendix A, Intake Structure Room Temperature Demonstration. \_\_\_\_\_
- C. ~~If the Intake Structure Room Temperature Demonstration was satisfactory, (Then EXIT Tech Spec 3.7.4) action statement for the inoperable respective electrical train ICW train.~~ \_\_\_\_\_

3. §1 If either HVE-41A or HVE-41B will be removed from service (Modes 5, 6 or defueled), Then PERFORM the following:

- A. PERFORM the following until fans are returned to service:
  - 1. MONITOR room temperature at least once per shift. \_\_\_\_\_
  - 2. RECORD Intake Structure room temperatures.

TIME	TEMPERATURE	TIME	TEMPERATURE

- B. If the Intake Structure room temperature is expected to reach 120°F, Then INSTALL temporary ventilation equipment. \_\_\_\_\_

**END OF SECTION 7.0**

# Single Question Report

---

**QID#:** 1566    **Objective:** 0902713-03    **System:** CW/ICW  
**Rev:** 0    **Cog Level:** 2    **KA #**G.2.2.3    **RO** 3.1    **SRO** 3.3

---

Unit 2 is in Mode 1 when the ANPO calls and states HVE-41A Intake Structure Ventilation fan motor was smoking and the breaker has tripped.

Based on the above information, what is the status of the 2A ICW Pump?

- A. Operable as long as HVE-41B remains Operable.
- B. Operable as long as the ICW room temperature remains less than design temperature.
- C. Inoperable until ICW room temperature can be proven to be maintained less than design temperature.
- D. Inoperable until a temporary air moving system can be installed.

**Reasons the choices are right or wrong.**

**Correct answer is C.**

- A.
- B.
- C.
- D.

**Source Ref:** REFERENCES: ADM. 0010120 'Conduct of Operations'

**Open Ref:**

**Revision Notes:** JMM 3/8/06

## Question Use History

HLC 17 Practice Quiz, 0720023, 3/13/2006  
HLC 17 Practice Quiz, 0720023, 3/13/2006  
HLC 17 Practice Quiz, 0720023, 3/13/2006  
HLC 17 Practice Quiz, 0720023, 3/13/2006

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>3</u>
	Group #	_____	<u>Cat. 2</u>
	K/A #	<u>2.2.21</u>	
	Importance Rating	_____	<u>4.1</u>

Equipment Control: Knowledge of pre- and post-maintenance operability requirements.

Proposed Question: SRO 98

Unit 1A AFW pump has completed an oil change. Which of the following Post Maintenance Testing is required?

- A. Start pump. When amperage and discharge pressure stabilize, stop pump.
- B. Perform IST Code Run in accordance with applicable Operations Surveillance Procedure.
- C. Contact System Performance group to evaluate post maintenance testing requirements.
- D. Start pump and run sufficient time to verify no abnormal temperature, vibration, noise, flow and pressure.

Proposed Answer: D

Explanation (Optional):

- A. This test is performed when a breaker is racked out on safety related equipment even though no maintenance has been performed.
- B. Only performed after major maintenance or coupling maintenance
- C. System performance (SP) may determine PMT for major maintenance.
- D. Correct

Technical Reference(s): ADM-78.01 Post Maintenance Testing (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0902732-07 (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 \_\_\_\_\_  
55.43   2  

Comments:

REVISION NO.: 29A	PROCEDURE TITLE: POST MAINTENANCE TESTING	PAGE: 74 of 137
PROCEDURE NO.: ADM-78.01	ST. LUCIE PLANT	

**APPENDIX C**  
**POST MAINTENANCE TESTING GUIDE**  
(Page 38 of 73)

**PUMPS (Including Fire Pumps):** (continued)

**Post Maintenance Tests / Checks:**

Maintenance Activity	Post Maintenance Test
<ul style="list-style-type: none"> <li>• Replacement or Repair of Pump Internals (Shaft, Bearings, Impeller, Wear Rings, Shaft Seals, Casing, etc.)</li> <li>• Uncoupling of Pump</li> <li>• Coupling Lubrication</li> </ul>	<ol style="list-style-type: none"> <li>1. Pump Op Check (If the pump is a FIRE PUMP, <u>Then</u> following pump replacement or impeller, shaft, or casing modification or replacement, perform the Functional Test per OSP-15.15A/B for the applicable pump only. This procedure should be noted on the PMT form.) If designated as an IST pump, then perform:</li> <li>2. <u>IST code run</u> (if applicable per SP review)</li> </ol>
Oil Change	1. Pump OP Check
Packing Gland, Seal Water, Lubrication System, Cooling Water Systems or Preventive Maintenance, Adjustment of Accumulator Pressure	1. Pump Op Check (If designated as an IST pump, then System Performance will evaluate the need for an IST code run instead.)

Q-98

REVISION NO.: 29A	PROCEDURE TITLE: POST MAINTENANCE TESTING	PAGE: 73 of 137
PROCEDURE NO.: ADM-78.01	ST. LUCIE PLANT	

**APPENDIX C**  
**POST MAINTENANCE TESTING GUIDE**  
(Page 37 of 73)

**PUMPS (Including Fire Pumps):**

**NOTE**

For Emergency Diesel Generator pumps reference Appendix C, Emergency Diesel Generator (EDG) and Subcomponents.

**Pump test activities and descriptions include:**

1. Pump Operational Check - Start pump and run sufficient time to verify adequate discharge pressure or flow, no overheating, abnormal noise / vibration, and no seal or external leakage in excess of pump design. Contact System and Component Engineering for assistance, as required.
2. IST Code Run - Per applicable operating procedures in accordance with ASME Section XI In-Service Testing Program. Code run requirements determined by System Performance review.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	3
	Group #	_____	Cat. 3
	K/A #	2.3.6	_____
	Importance Rating	_____	3.8

Radiation Control: Ability to approve release permits.

Proposed Question: SRO 99

A liquid release is to be performed on the 1B Waste Monitor Tank with R-6627 out of service. Prior to signing approval for the release, which of the following would you expect to see attached to the permit?

- A. Two release rate calculations and a Procedure Change Request (PCR) requiring two independent valve lineups.
- B. Two release rate calculations and Appendix A for 10 CFR 50.59 Determination/Screening.
- C. Two independent radioactivity analysis and two release rate calculations.
- D. Two independent radioactivity analysis and a Temporary System Alteration documenting R-6627 out of service.

Proposed Answer: C

Explanation (Optional):

- A. PCR not required. Procedure allows release with monitor out of service
- B. 50.59 not required
- C. Correct
- D. TSA not required. Procedure allows release with monitor out of service

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

\_\_\_\_\_

\_\_\_\_\_

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_

Modified Bank # 2155 (Note changes or attach parent)

attached

ES-401

Written Examination  
Question Worksheet

Form ES-401-5

New

\_\_\_\_\_  
\_\_\_\_\_

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

4  
\_\_\_\_\_

Comments:

SK099

REVISION NO.: 12	PROCEDURE TITLE: CONTROLLED LIQUID RELEASE TO THE CIRCULATING WATER DISCHARGE ST. LUCIE UNIT 1	PAGE: 6 of 22
PROCEDURE NO.: 1-NOP-06.01		

**6.0 INSTRUCTIONS**

INITIAL

**6.1 Initial Conditions**

1. ENSURE Section 3.0, Prerequisites, completed. \_\_\_\_\_
2. REVIEW Section 4.0, Precautions / Limitations. \_\_\_\_\_
3. 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.

4. ¶1 REVIEW the Equipment Out of Service Log and determine if Channel R-6627, Liquid Waste Monitor has been declared Out of Service.
5. If Channel R-6627 is Out of Service, Then PERFORM the following:

	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**

# Single Question Report

---

<b>QID#:</b> 2155	<b>Objective:</b> 0000000-00	<b>System:</b> Liquid Waste		
<b>Rev:</b> 0	<b>Cog Level:</b> 1	<b>KA #</b> G.2.3.6	<b>RO</b> 3.1	<b>SRO</b>

---

You are reviewing a Liquid Release Permit in preparation to release the 1B Waste Monitor Tank. The Liquid Release radiation monitor R-6627 has been out of service for 10 days.

Which ONE (1) of the following would you expect to see attached to the Liquid Release permit as a result of R-6627 being out of service?

- A. Two independent release rate calculations
- B. Plant General Manger letter giving permission to release the tank
- C. Chemistry Supervisor letter giving permission to release the tank
- D. Temporary System Alteration documenting R-6627 being out of service

## Reasons the choices are right or wrong.

Correct answer is A.

- A.
- B. TSA not required
- C. Chemistry Supervisor only approves permit if high activity
- D. Plant General Manager approval required for Containment Purge in Modes 1-4, not liquid release with monitor out of service.

**Source Ref:** 1-NOP-06.01 Controlled Liquid Release To The Circ

**Open Ref:**

**Revision Notes:** JMM 3/10/06

## Question Use History

HLC 17 Practice Quiz, 0720023, 3/13/2006  
HLC 17 Practice Quiz, 0720023, 3/13/2006  
HLC 17 Practice Quiz, 0720023, 3/13/2006  
HLC 17 Practice Quiz, 0720023, 3/13/2006

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	3
	Group #	_____	Cat. 4
	K/A #	2.4.29	_____
	Importance Rating	_____	4.4

Emergency Procedures / Plan: Knowledge of the emergency plan.

Proposed Question: SRO 100

The following event has occurred:

- St. Lucie County Sherriff Department has notified Security that five armed men have taken control of a Brinks Armored vehicle and are heading toward the Plant.
- Two minutes later, Security notifies the Control Room the Brinks vehicle has pulled into Unit 1 (North) parking lot.
- Security personnel have surrounded the truck and no gunfire has occurred.

Which of the following actions should be taken?

- Direct a trip of Unit 1 and 2.  
Implement EPIP-01, and classify the event as UNUSUAL EVENT.
- Direct a trip of Unit 1 and 2.  
Implement EPIP-01, and classify the event as ALERT.
- Direct a rapid downpower of Unit 1 and 2.  
Implement EPIP-01, and classify the event as UNUSUAL EVENT.
- Direct a rapid downpower of Unit 1 and 2.  
Implement EPIP-01, and classify the event as ALERT.

Proposed Answer: D

Explanation (Optional):

- Correct if armed intruders in protected area (inside the fence)
- Correct if armed intruders in protected area (inside the fence) Classification would be Alert
- CORRECT, downpower AND classification
- Incorrect classification

Technical Reference(s): ONP-72.01 Response to Security Events (Attach if not previously provided)

EPIP-01 Classification of Emergencies  
PSL OPS ADM 763 R00

Proposed references to be provided to applicants during examination: ONP-72.01 Response to Security Events  
EPIP-01 Classification of Emergencies

Learning Objective: PSL OPS ADM 763 R00 Obj. 2b (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:

Proposed references to be provided to applicants during examination (SRO)

- EOP-99 Figure 1A and 1B
- 2-ONP-100.02 Control Room Inaccessibility figure 8
- 2-NOP-03.05 Shutdown Cooling Appendix C
- 2-OSP-07.04B Containment Spray Periodic Data Sheet 1
- ONP-72.01 Response to Security Events
- EPIP-01 Classification of Emergencies

REVISION NO.: 13	PROCEDURE TITLE: <b>CLASSIFICATION OF EMERGENCIES</b>	PAGE: 34 of 38
PROCEDURE NO.: EPIP-01	<b>ST. LUCIE PLANT</b>	

**ATTACHMENT 1**  
**EMERGENCY CLASSIFICATION TABLE**  
(Page 20 of 20)

EVENT/CLASS	UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
21.1 <sup>6.7</sup> <u>SECURITY THREAT</u>	<p><b>A. <u>Security Threat due to any of the following:</u></b></p> <ul style="list-style-type: none"> <li>Bomb threat</li> <li>Attack Threat <ul style="list-style-type: none"> <li>- Land / Vehicle</li> <li>- Waterborne</li> <li>- Airborne</li> <li>- Insider</li> </ul> </li> <li>Protected Area intrusion attempt or breach</li> <li>Sabotage attempt</li> <li>Internal disturbance</li> <li>Civil disturbance</li> <li>Vital Area intrusion</li> <li>Security Force strike</li> <li>Credible site-specific Security Threat notification</li> <li>Extortion / Coercion / Hostage Threat against plant</li> <li>Sniper attack</li> <li>Validated notification from NRC providing information of an aircraft threat</li> </ul>	<p><b>B. <u>Ongoing Security Compromise</u></b></p> <ul style="list-style-type: none"> <li>Validated notification from the NRC of an AIRLINER attack threat less than 30 minutes away <u>OR</u></li> <li>Notification from the site Security Force of one of the following occurring in the <b>Owner Controlled Area:</b> <ul style="list-style-type: none"> <li>- Armed attack <u>OR</u></li> <li>- Explosive attack <u>OR</u></li> <li>- AIRLINER impact <u>OR</u></li> <li>- Other HOSTILE ACTION</li> </ul> </li> </ul>	<p><b>C. <u>Imminent Loss of Physical Control of the Plant</u></b></p> <ul style="list-style-type: none"> <li>Notification from the site Security Force that one of the following is occurring within the <b>Protected Area:</b> <ul style="list-style-type: none"> <li>- Armed attack <u>OR</u></li> <li>- Explosive attack <u>OR</u></li> <li>- AIRLINER impact <u>OR</u></li> <li>- Other HOSTILE ACTION</li> </ul> </li> </ul>	<p><b>D. <u>Security Event Resulting in Loss of Physical Control of the Facility</u></b></p> <p>A HOSTILE FORCE has taken control of plant equipment such that plant personnel are unable to operate equipment required to maintain safety functions</p>

**NOTE**

**AIRLINER** - Airliner is meant to be a large aircraft with the potential for causing significant damage to the plant.

**HOSTILE ACTION** - An act toward a Nuclear Power Plant or its personnel that includes the use of violent force to destroy equipment, takes hostages and / or intimidates the licensee to achieve an end. This includes attach by air, land or water using guns, explosives, projectiles, vehicles or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on the Nuclear Power Plant. Non-terrorism-based EALs should be used to address such activities, (e.g., violent acts between individuals in the Owner Controlled Area).

**HOSTILE FORCE** - One or more individuals who are engaged in a determined assault, overtly or by stealth and deception, equipped with suitable weapons capable of killing, maiming or causing destruction.

21. SECURITY THREAT

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

5/20/00

5 Ro 100

EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10 CFR §2.390

	<h1>ST. LUCIE PLANT</h1> <h2>OFF-NORMAL OPERATING PROCEDURE</h2> <p>QUALITY RELATED CONTINUOUS USE</p>	Procedure No. <b>ONP-72.01</b>
		Current Revision No. <b>2A</b>
		Effective Date <b>07/16/07</b>

**FOR INFORMATION ONLY**  
 Before use, verify revision and change documentation (if applicable) with a controlled index or document.  
 DATE VERIFIED \_\_\_\_\_ INITIAL \_\_\_\_\_

Title: **RESPONSE TO SECURITY EVENTS**

Responsible Department: **OPERATIONS**

**REVISION SUMMARY:**

**NOTE**

This procedure implements the **Emergency Plan** and is subject to the same processing.

**Revision 2A** - Incorporated MC 07-2336 to add reference symbols for Condition Report 2005-02 commitments. (J.R. Walker, 07/11/07)

**Revision 2** - Incorporated PCR 06-4462 to revise recovery steps for informational airborne threat and credible insider threat. Added EPIP Note and editorial/administrative changes. (J.R. Walker, 03/08/07)

**Revision 1 - THIS PROCEDURE HAS BEEN COMPLETELY REWRITTEN.** Incorporated PCR 06-2003 to change sections to appendixes and add new reference EIPs to reflect latest revision to ONP Writer's Guide. (Joe Hessling, 08/31/06)

**REVISION 0** – Incorporated PCR 05-3576 to create new procedure to replace various operator actions previously performed in various Security Force Instructions. (Joe Hessling, 02/14/06)

Revision <u>0</u>	FRG Review Date <u>02/14/06</u>	Approved By <u>G. L. Johnston</u> Plant General Manager	Approval Date <u>02/14/06</u>	S__OPS DATE DOCT DOCN SYS COM ITM
Revision <u>2A</u>	FRG Review Date <u>03/06/07</u>	Approved By <u>C. Costanzo</u> Plant General Manager N/A	Approval Date <u>03/08/07</u>	
		Authorized Approver <u>D. Calabrese</u>	<u>07/11/07</u>	
		Authorized Approver (Minor Correction)		

EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10 CFR §2.390

**EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10 CFR §2.390**

REVISION NO.: 2A	PROCEDURE TITLE: RESPONSE TO SECURITY EVENTS ST. LUCIE PLANT	PAGE: 2 of 26
PROCEDURE NO.: ONP-72.01		

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EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10 CFR §2.390

REVISION NO.: 2A	PROCEDURE TITLE: RESPONSE TO SECURITY EVENTS ST. LUCIE PLANT	PAGE: 3 of 26
PROCEDURE NO.: ONP-72.01		

1.0 PURPOSE

1.1 Provide operations instructions for responding to Land Based, Airborne Threats, or Credible Insider Threat.

2.0 REFERENCES

**NOTE**

One or more of the following symbols may be used in this procedure:

§ Indicates a Regulatory commitment made by Technical Specifications, Condition of License, Audit, LER, Bulletin, Operating Experience, License Renewal, etc. and shall NOT be revised without the required Focus review and appropriate approval.

¶ Indicates a management directive, vendor recommendation, plant practice or other non-regulatory commitment that should NOT be revised without consultation with the plant staff.

Ψ Indicates a step that requires a sign off on an attachment.

2.1 NRC Bulletin 2005-02, Emergency Preparedness and Response Actions for Security Based Events

2.2 §<sub>1</sub> Condition Report 2006-9734 (Track Commitments made to the NRC regarding Safeguards Interim Compensatory Measure-Section B.5.b)

2.3 EPIP-01, Classification of Emergencies

2.4 EPIP-02, Duties and Responsibilities of the Emergency Coordinator

2.5 EPIP-03, Emergency Response Organization Notification/Staff Augmentation

2.6 EPIP-07, Conduct of Evacuations/Assembly

2.7 SFI-2408, Response to Large Area Fire

2.8 SFI-2415, Target Sets

2.9 SFI-6310, Threat Assessment and Notifications

2.10 SFI-6307, Emergency Plan Implementing Procedures

2.11 1-ONP-22.01, Rapid Downpower

2.12 2-ONP-22.01, Rapid Downpower

/R2

/R2A

/R2

**EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10 CFR §2.390**

REVISION NO.: 2A	PROCEDURE TITLE: RESPONSE TO SECURITY EVENTS ST. LUCIE PLANT	PAGE: 4 of 26
PROCEDURE NO.: ONP-72.01		

**2.13** 1-ONP-25.02, Ventilation Systems

**2.14** 2-ONP-25.02, Ventilation Systems

**3.0** RECORDS REQUIRED

**3.1** Normal log entries.

**4.0** ENTRY CONDITIONS

**4.1** Security reports a Security Alert per Security Force Instructions.

**4.2** Security reports a Security Emergency in accordance with SFI-6310, Threat Assessment and Notifications.

**4.3** The NRC or NORAD reports an **IMMINENT** Airborne Threat to the plant. This is based upon the following:

- The estimated time to site arrival is 5 minutes or less,

**AND**

- Altitude or heading changes align the aircraft with the site,

**AND**

- Notification / information of:

- A Track of Interest (TOI) verified by NRC and / or NORAD

**OR**

- Anomalous flight activity detected by local observation, LLEA, FAA **AND** verified by one of the following:

- NRC has been called and verified with NORAD the credibility of the **IMMINENT** Threat
- Independent verification (Operations or Security) of the credibility of the Threat if the anomalous flight activity was detected by local observation.

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- 4.4** The NRC or NORAD reports a **PROBABLE** Airborne Threat to the plant. This is based upon the following:
- The estimated time to site arrival is greater than 5 minutes, but less than or equal to 30 minutes,
- AND**
- A Track of Interest (TOI) verified by NRC and / or NORAD due to anomalous flight activity.
- 4.5** The NRC or NORAD reports an **INFORMATIONAL** Airborne Threat to the plant. This is based on the following:
- The estimated time to site arrival is greater than 30 minutes,
- AND**
- A Track of Interest (TOI) verified by NRC and / or NORAD due to anomalous flight activity.
- 5.0** EXIT CONDITIONS
- 5.1** The Security Event has been terminated.
- 5.2** Recovery actions have been implemented to address the plant conditions.

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6.0 OPERATOR ACTIONS

**INSTRUCTIONS**

**CONTINGENCY ACTIONS**

1. VALIDATE the authenticity of any Airborne Threat by calling NRC Headquarters Operations Center. USE the NRC ENS telephone or a commercial line to call 301-816-5100.
2. If either of the following conditions exist:
  - Security Department reports ARMED intruders are within the Protected Area fence.
  - **IMMINENT** Aircraft Threat (less than 5 minutes arrival time).

Then PERFORM the following:

  - A. TRIP Unit 1 Reactor.
  - B. TRIP Unit 2 Reactor.
3. IMPLEMENT Security Checklist in accordance with EPIP-02, Duties and Responsibilities of the Emergency Coordinator.
4. If the Security Event is a **LAND BASED** Threat, Then GO TO Appendix A, Response to LAND BASED Threat.
5. If the Security Event is an **IMMINENT** Airborne Threat, Then GO TO Appendix B, Response to Imminent Airborne Threat.
6. If the Security Event is a **PROBABLE** Airborne Threat, Then GO TO Appendix C, Response to Probable Airborne Threat.

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6.0 OPERATOR ACTIONS (continued)

**INSTRUCTIONS**

**CONTINGENCY ACTIONS**

7. If the Security Event is an **INFORMATIONAL** Airborne Threat, Then GO TO Appendix D, Response to Informational Airborne Threat.
8. If the Security Threat is a **CREDIBLE INSIDER** Threat, Then GO TO Appendix E, Response to Credible Insider Threat.

END OF SECTION 6.0

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**APPENDIX A**  
**RESPONSE TO LAND BASED THREAT**  
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1. ESTABLISH communications with both Control Rooms and Security by PERFORMING the following:
  - A. DON headset attached to Control Room Security Hotline Phone.
  - B. MONITOR Security Channel on Operations Radio Handset.
  - C. If Security Channel is disabled, Then MONITOR Security Backup radio.

**NOTE**

- Armed intruders inside the Owner Controlled Area, is a potential Alert declaration.
- Armed intruders inside the Protected Area, is a potential Site Area Emergency declaration.

2. Using the Gai-Tronics and Boost function, PERFORM the following announcement:

§1 "ATTENTION ALL PLANT PERSONNEL, THE PLANT IS IN A SECURITY EMERGENCY. TAKE COVER AND DO NOT MOVE. TAKE COVER AND DO NOT MOVE."

REPEAT announcement.
3. IMPLEMENT the Emergency Plan. REFER TO EPIP-01, Classification of Emergencies, Attachment 1, Event / Class 21, Security Threat.
4. PLACE Control Room Ventilation in recirculation mode in accordance with 1(2)-ONP-25.02, Appendix B.
5. BAR the Control Room Doors.

/R2A

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**APPENDIX A**  
**RESPONSE TO LAND BASED THREAT**  
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6. EVALUATE actions to place the reactors in a safe shutdown state with all decay heat removal systems available as follows:

A. If ANY of the following conditions exist:

- Armed intruders are within the Protected Area fence
- Damage to plant components due to intruder actions
- Unexplained loss of multiple plant components in a short period of time
- Personnel Injury from intruder within the Protected Area fence
- Shift Manager's discretion

Then TRIP Unit 1 and Unit 2 Reactors.

B. If ANY of the following conditions exist:

- Armed intruders in the Owner Controlled Area
- Breach of Protected Area by unauthorized personnel
- Vehicle bomb detonation in Owner Controlled Area
- Shift Manager's discretion

Then PERFORM Rapid Downpower of Unit 1 and Unit 2. REFER TO 1[2]-ONP-22.01, Rapid Downpower.

7. CONSIDER RCS Cooldown.

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**APPENDIX A**  
**RESPONSE TO LAND BASED THREAT**

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8. CONSIDER isolating non-essential systems or portions of systems to minimize the effects of losses of plant areas or non-isolable RCS leakage paths which could lead to core damage or Containment Bypass, e.g.:
- ISOLATE Intake Cooling Water to the Turbine Building (after Turbine is tripped)
  - ISOLATE MSRs
  - ISOLATE S/G blowdown
  - ISOLATE Letdown
  - ISOLATE RCS Sample Lines
9. MAINTAIN contact with Security, keeping abreast of the following:
- Number of armed intruders
  - Current location of armed intruders
  - Special information (armed, explosions in the area, vehicles, etc.)
  - Equipment lost
10. If reported from Security or by Control Room observation that equipment is lost, Then CONFER with Security of areas to protect. REFER TO SFI-2415, Target Sets.
11. If equipment is lost, Then REFER TO SFI-2408, Response to Large Area Fire.
12. CONFER with Security whether or not to evacuate personnel.

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**APPENDIX A**  
**RESPONSE TO LAND BASED THREAT**  
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13. When the Security Event is secured, Then PERFORM the following:
- A. Security and Operations personnel to sweep the affected areas.
  - B. RE-MOBILIZE plant personnel using the Gai-Tronics system and providing the following announcement:  
  
"ATTENTION ALL PERSONNEL. THE PLANT SECURITY EMERGENCY IS OVER. ALL PLANT PERSONNEL REPORT TO YOUR NORMAL WORK LOCATION OR CONTACT YOUR SUPERVISOR".
  - C. CONFER with appropriate ERO management (TSC Emergency Coordinator, Recovery Manager) to determine any further emergency plan actions.
14. DIRECT Security to PERFORM personnel accountability.

**END OF APPENDIX A**

**EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10 CFR §2.390**

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**APPENDIX B**  
**RESPONSE TO IMMINENT AIRBORNE THREAT**  
(Track of Interest is plant site with arrival less than 5 minutes)  
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**NOTE**  
Imminent Airborne Threat, is a potential Alert declaration (EAL, Security Emergency).

1. NOTIFY Security of Imminent Airborne Threat.
2. SOUND the SITE EVACUATION ALARM.

**NOTE**  
The Operations Shift Manager Selects the personnel required to remain in the Control Room in order to perform the actions of this procedure.

3. Using the Gai-Tronics and Boost function, PERFORM the following announcement:  
  
§1 "ATTENTION ALL PLANT PERSONNEL; A SECURITY EVENT IS IN PROGRESS. ALL FIRE BRIGADE MEMBERS ARE TO REPORT TO THE ALTERNATE FIRE STATION. ALL OTHER PERSONNEL SHOULD IMMEDIATELY PROCEED TO THE NEAREST SECURITY BUILDING FOR RAPID EVACUATION."  
  
REPEAT announcement.
4. ESTABLISH communications with both Control Rooms and Security by PERFORMING the following:
  - DON headset attached to Control Room Security Hotline Phone.
  - MONITOR Security Channel on Operations Radio Handset.
  - If Security Channel is disabled, Then MONITOR Security Backup radio.
5. IMPLEMENT the Emergency Plan. REFER TO EPIP-01, Classification of Emergencies, Attachment 1, Event / Class 21, Security Threat.

/R2A

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**APPENDIX B**  
**RESPONSE TO IMMINENT AIRBORNE THREAT**  
(Track of Interest is plant site with arrival less than 5 minutes)  
(Page 2 of 4)

6. If either unit is in refueling or shutdown modes, Then PERFORM the following:
  - A. PLACE fuel assemblies in secure locations.
  - B. DISCONTINUE fuel-handling operations.
7. ESTABLISH and MAINTAIN Steam Generator levels to the high end of the band allowed by Emergency Operating Procedures.
8. MANUALLY ACTUATE Containment Isolation Signal (CIS).
9. PLACE Control Room ventilation in the recirculation mode in accordance with 1(2)-ONP-25.02, Appendix B.
10. If during night time hours, Then SECURE exterior plant lighting as follows:
  - A. On Unit 1, PLACE the following breakers in the OFF position:
    - LP 130, BKR 1-41247 (MCC 1A5)
    - LP 2A N/E, BKR 1-41208 (MCC 1A5)
    - LP 2B N/E, BKR 1-42009 (MCC 1B5)
    - LP 2C N/E, BKR 1-41304 (MCC 1A6)
    - LP 2D N/E, BKR 1-42134 (MCC 1B6)
  - B. On Unit 2, PLACE the following breakers in the OFF position:
    - LP 230 N/E, BKR 2-42135 (MCC 2B6)
    - LP 2-2A2 N/E, BKR 2-41228 (MCC 2A5)
    - LP 2-2B2 N/E, BKR 2-42030 (MCC 2B5)

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**APPENDIX B**  
**RESPONSE TO IMMINENT AIRBORNE THREAT**  
(Track of Interest is plant site with arrival less than 5 minutes)  
(Page 3 of 4)

10. (continued)
- C. INSTRUCT Security to PERFORM the following:
1. PLACE the following breakers located in the ESB Electrical Room, near IMUX 6, in the OFF position:
    - LP2-2A1 N/E, CKT 1 thru 7
    - LP2-2B1 N/E, CKT 1 thru 7
    - LP 260, CKT 1 thru 6
    - If necessary, secure all portable lighting units.
11. RECALL extra operations and emergency response personnel. REFER TO EPIP-03, Emergency Response Organization Notification/Staff Augmentation.
12. COMPLETE the following rapidly:
- A. BACK OUT OF / STOP in progress surveillance testing / maintenance.
  - B. RESTORE inoperable ECCS equipment to OPERABLE if possible.
  - C. CLOSE / VERIFY CLOSED Control Room doors.
  - D. SECURE Primary Containment Purge.
13. If in mode 5 or 6, Then CLOSE the Equipment Hatch Door and Personnel Hatches if possible.
14. If the Airborne Threat has impacted the plant site, Then REFER TO SFI-2408, Response to Large Area Fire.

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**APPENDIX B**  
**RESPONSE TO IMMINENT AIRBORNE THREAT**  
(Track of Interest is plant site with arrival less than 5 minutes)  
(Page 4 of 4)

15. When notified by Security that Security Defensive Strategies are in place, and the event has been TERMINATED, Then PERFORM the following:
- A. Using an announcement similar to the following, RE-MOBILIZE plant personnel using the plant page system:  
  
“ ATTENTION ALL PERSONNEL. THE PLANT SECURITY EMERGENCY IS OVER. ALL PERSONNEL REPORT TO YOUR NORMAL WORK STATION OR CONTACT YOUR SUPERVISOR.”
  - B. CONFER with appropriate ERO management (TSC Emergency Coordinator, Recovery Manager) to determine any further emergency plan actions.
  - C. DIRECT Security to PERFORM personnel accountability.

**END OF APPENDIX B**

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**APPENDIX C**  
**RESPONSE TO PROBABLE AIRBORNE THREAT**

(Track of Interest is plant site with arrival between 5 and 30 minutes)  
(Page 1 of 5)

1. If the Airborne Threat escalates to **IMMINENT**, Then PERFORM the following:
  - A. TRIP Unit 1 Reactor.
  - B. TRIP Unit 2 Reactor.
  - C. GO TO Appendix B, Response To Imminent Airborne Threat.
2. If the Airborne Threat is **INFORMATIONAL**, Then GO TO Appendix D, Response To Informational Airborne Threat.
3. NOTIFY on-site Security of Probable Airborne Threat.
4. SOUND the SITE EVACUATION ALARM.

**NOTE**

The Operations Shift Manager Selects the personnel required to remain in the Control Room in order to perform the actions of this procedure.

5. Using the Gai-Tronics and Boost function, PERFORM the following announcement:

§1 "ATTENTION ALL PLANT PERSONNEL; A SECURITY EVENT IS IN PROGRESS. ALL FIRE BRIGADE MEMBERS ARE TO REPORT TO THE ALTERNATE FIRE STATION. ALL OTHER PERSONNEL SHOULD IMMEDIATELY PROCEED TO THE NEAREST SECURITY BUILDING FOR RAPID EVACUATION."

REPEAT announcement.
6. ESTABLISH communications with both Control Rooms and Security by PERFORMING the following:
  - DON headset attached to Control Room Security Hotline Phone.
  - MONITOR Security Channel on Operations Radio Handset.
  - If Security Channel is disabled, Then MONITOR Security Backup radio.

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**APPENDIX C**  
**RESPONSE TO PROBABLE AIRBORNE THREAT**

(Track of Interest is plant site with arrival between 5 and 30 minutes)  
(Page 2 of 5)

7. PREPARE for Security and other staff relocations / evacuation.
8. CONFER with Security as to the feasibility of a Rapid Evacuation.

**NOTE**

Probable Airborne Threat, is a potential Alert declaration (EAL, Security Emergency).

9. IMPLEMENT the Emergency Plan. REFER TO EPIP-01, Classification of Emergencies, Attachment 1, Event / Class 21, Security Threat.
10. If either unit is in refueling or shutdown modes, Then PERFORM the following:
  - A. PLACE fuel assemblies in secure locations.
  - B. DISCONTINUE fuel-handling operations.

**NOTE**

Other measures included in this procedure should be considered and attempted before a rapid downpower of the reactor is performed while the intent of the suspect aircraft is determined.

11. COMMENCE a rapid downpower of the reactor (less than 30 minutes).
12. INFORM System Dispatcher of rapid downpower.
13. PLACE Control Room ventilation in the recirculation mode in accordance with 1(2)-ONP-25.02, Appendix B.

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**APPENDIX C**  
**RESPONSE TO PROBABLE AIRBORNE THREAT**

(Track of Interest is plant site with arrival between 5 and 30 minutes)  
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14. If during night time hours, Then SECURE exterior plant lighting as follows:
- A. On Unit 1, PLACE the following breakers in the OFF position:
- LP 130, BKR 1-41247 (MCC 1A5)
  - LP 2A N/E, BKR 1-41208 (MCC 1A5)
  - LP 2B N/E, BKR 1-42009 (MCC 1B5)
  - LP 2C N/E, BKR 1-41304 (MCC 1A6)
  - LP 2D N/E, BKR 1-42134 (MCC 1B6)
- B. On Unit 2, PLACE the following breakers in the OFF position:
- LP 230 N/E, BKR 2-42135 (MCC 2B6)
  - LP 2-2A2 N/E, BKR 2-41228 (MCC 2A5)
  - LP 2-2B2 N/E, BKR 2-42030 (MCC 2B5)
- C. INSTRUCT Security to PERFORM the following:
1. PLACE the following breakers located in the ESB Electrical Room, near IMUX 6, in the OFF position.
- LP2-2A1 N/E, CKT 1 thru 7
  - LP2-2B1 N/E, CKT 1 thru 7
  - LP 260, CKT 1 thru 6
  - If necessary, Then SECURE all portable lighting units.

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**APPENDIX C**  
**RESPONSE TO PROBABLE AIRBORNE THREAT**

(Track of Interest is plant site with arrival between 5 and 30 minutes)  
(Page 4 of 5)

15. COMPLETE the following rapidly:
- A. BACK OUT OF / STOP in progress surveillance testing / maintenance.
  - B. RETURN equipment to functional status if possible.
  - C. ENSURE the Fire Header is pressurized, and START Fire Pumps if necessary.
  - D. RESTORE inoperable ECCS equipment to OPERABLE if possible.
  - E. CLOSE / VERIFY CLOSED Control Room doors.
  - F. If in mode 5 or 6, Then CLOSE the Equipment Hatch Door and Personnel Hatches, if possible.
  - G. SECURE Primary Containment Purge.
  - H. Following reactor shutdown, MANUALLY ACTUATE Containment Isolation Signal (CIS).
  - I. RESTORE / ENSURE systems available for reactor shutdown and ATWS mitigation (RPS).
  - J. VERIFY the following decay heat removal systems available:
    - AFW
    - SDC
    - Main Condenser
  - K. If plant conditions permit, Then ISOLATE the spent fuel pool purification system.

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**APPENDIX C**  
**RESPONSE TO PROBABLE AIRBORNE THREAT**

(Track of Interest is plant site with arrival between 5 and 30 minutes)  
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15. (continued)
- L. CONFER with Security as to the feasibility of a Rapid Evacuation.
  - M. EVACUATE/DISPERSE unnecessary personnel. REFER TO EPIP-07, Conduct of Evacuations/Assembly.
  - N. RECALL extra operations and emergency response personnel. REFER TO EPIP-03, Emergency Response Organization Notification/Staff Augmentation.
  - O. NOTIFY Health Physics personnel to VERIFY Survey Vehicles and Survey Instruments and emergency kits are outside the vital or Protected Area.
  - P. DIRECT operators, if available, to the remote shutdown panels.
  - Q. As plant conditions allow, SECURE all possible site-building fans, to limit the number of building supply and exhaust fans.
16. When notified by Security that Security Defensive Strategies are in place, and that the event has been TERMINATED, Then PERFORM the following:
- A. Using an announcement similar to the following, RE-MOBILIZE plant personnel using the Gai-tronics system:  
  
“ ATTENTION ALL PERSONNEL. THE PLANT SECURITY EMERGENCY IS OVER. ALL PERSONNEL REPORT TO YOUR NORMAL WORK STATION OR CONTACT YOUR SUPERVISOR.”
  - B. CONFER with appropriate ERO management (TSC Emergency Coordinator, Recovery Manager) to determine any further emergency plan actions.
  - C. DIRECT Security to PERFORM personnel accountability.

**END OF APPENDIX C**

REVISION NO.: 2A	PROCEDURE TITLE: RESPONSE TO SECURITY EVENTS	PAGE: 21 of 26
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**APPENDIX D**  
**RESPONSE TO INFORMATIONAL AIRBORNE THREAT**  
(Track of Interest is plant site with arrival time greater than 30 minutes)  
(Page 1 of 4)

1. If the Airborne Threat escalates to **IMMINENT**, Then PERFORM the following:
  - A. TRIP Unit 1 Reactor.
  - B. TRIP Unit 2 Reactor.
  - C. GO TO Appendix B, Response To Imminent Airborne Threat.
2. If the Airborne Threat escalates to **PROBABLE**, Then GO TO Appendix C, Response To Probable Airborne Threat.
3. NOTIFY on-site Security of the Airborne Threat.
4. Using the Gai-Tronics and Boost function, PERFORM the following announcement:

§1 "ATTENTION ALL PLANT PERSONNEL; A SECURITY EVENT IS IN PROGRESS. ALL FIELD OPERATORS AND FIRE BRIGADE MEMBERS ARE TO REPORT TO THE ONE STOP SHOP IN THE SOUTH SERVICE BUILDING. ALL OTHER PERSONNEL SHOULD REPORT TO THEIR WORK LOCATIONS IMMEDIATELY FOR ASSEMBLY AND ACCOUNTABILITY."

REPEAT announcement.
5. PREPARE for Security and other staff relocations / evacuation.

<b>NOTE</b> Informational Airborne Threat, is a potential Unusual Event declaration (EAL, Security Alert).
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6. IMPLEMENT the Emergency Plan. REFER TO EPIP-01, Classification of Emergencies, Attachment 1, Event / Class 21, Security Threat.

/R2A

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**APPENDIX D**  
**RESPONSE TO INFORMATIONAL AIRBORNE THREAT**  
(Track of Interest is plant site with arrival time greater than 30 minutes)  
(Page 2 of 4)

7. If either unit is in refueling or shutdown modes, Then PERFORM the following:
  - A. PLACE fuel assemblies in secure locations.
  - B. DISCONTINUE fuel-handling operations.
8. PREPARE to commence a rapid downpower of both reactors.
9. NOTIFY System Dispatcher.
10. PLACE Control Room ventilation in the recirculation mode in accordance with 1(2)-ONP-25.02, Appendix B.
11. If during night time hours, Then PREPARE to SECURE exterior plant lighting.
12. PERFORM the following:
  - A. BACK OUT of / STOP in progress surveillance testing / maintenance.
  - B. ENSURE the fire header is pressurized and START fire Pumps if necessary.
  - C. RESTORE inoperable ECCS equipment to OPERABLE if possible.
  - D. CLOSE / VERIFY CLOSED Control Room doors.
  - E. If in mode 5 or 6, Then CLOSE the Equipment Hatch Door and Personnel Hatches if possible.
  - F. SECURE Primary Containment Purge and CLOSE / VERIFY CLOSED Primary Containment Penetrations.
  - G. RESTORE / ENSURE systems available for reactor shutdown and ATWS mitigation (RPS).
  - H. FILL the CST to the upper limit of the operating band.

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**APPENDIX D**  
**RESPONSE TO INFORMATIONAL AIRBORNE THREAT**  
(Track of Interest is plant site with arrival time greater than 30 minutes)  
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12. (continued)

- I. VERIFY the following make-up water source inventories are above established minimums:
  - Treated Water Storage Tank
  - Demineralized Water Storage Tank
  - City Water Storage Tanks
- J. ENSURE the following decay heat removal systems are available:
  - AFW
  - SDC
  - Main Condenser
- K. If plant conditions permit, Then ISOLATE the spent fuel pool purification system.
- L. CONFER with Security as to the feasibility of a Rapid Evacuation.
- M. EVACUATE / DISPERSE unnecessary personnel. REFER TO EPIP-07, Conduct of Evacuations/Assembly.
- N. RECALL extra operations and emergency response personnel. REFER TO EPIP-03, Emergency Response Organization Notification / Staff Augmentation.
- O. NOTIFY Health Physics personnel to VERIFY Survey Vehicles and Survey Instruments and emergency kits outside the vital or Protected Area.
- P. DIRECT operators, if available, to the Remote Shutdown Panels.
- Q. As plant conditions allow, SECURE **ALL** possible site-building fans, to limit the number of building supply and exhaust fans.

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**APPENDIX D**  
**RESPONSE TO INFORMATIONAL AIRBORNE THREAT**  
(Track of Interest is plant site with arrival time greater than 30 minutes)  
(Page 4 of 4)

13. When notified by Security that Security Defensive Strategies are in place, and that the event has been terminated, Then PERFORM the following:
- A. Using an announcement similar to the following, RE-MOBILIZE plant personnel using the Gai-tronics system:  
  
“ ATTENTION ALL PERSONNEL. THE PLANT SECURITY EMERGENCY IS OVER. ALL PERSONNEL REPORT TO YOUR NORMAL WORK STATION OR CONTACT YOUR SUPERVISOR.”
  - B. CONFER with senior plant management to determine any further actions.
  - C. DIRECT Security to PERFORM Personnel Accountability.

**END OF APPENDIX D**

RR2

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**APPENDIX E**  
**RESPONSE TO CREDIBLE INSIDER THREAT**  
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**NOTE**

- A **CREDIBLE INSIDER** Threat is any badged employee acting in either an active or passive manner in support of either an overt or covert attempt to commit radiological sabotage.
- If personnel are already in designated areas due to severe weather, e.g., Tornado Warning OR Tropical Force Winds or greater, Then **CONSIDER** the risk of moving these personnel.

1. Make the following announcement:

“ATTENTION ALL PLANT PERSONNEL. ASSEMBLY AND ACCOUNTABILITY HAS BEEN ORDERED FOR ALL PLANT PERSONNEL. PLACE YOUR WORK IN A SAFE CONDITION AND RETURN TO YOUR NORMAL WORK LOCATION.”  
“SUPERVISORS ARE DIRECTED TO ACCOUNT FOR PERSONNEL AND NOTIFY THEIR DEPARTMENT MANAGER OF ANY INCONSISTENCIES.”

**NOTE**

Credible Insider Threat, is a potential Unusual Event declaration (EAL, Security Alert).

2. IMPLEMENT the Emergency Plan. REFER TO EPIP-01, Classification of Emergencies, Attachment 1, Event / Class 21, Security Threat.

3. ESTABLISH communications with both Control Rooms and Security by PERFORMING the following:

- DON headset attached to Control Room Security Hotline Phone.
- MONITOR Security Channel on Operations Radio Handset.
- If Security Channel is disabled, Then MONITOR Security Backup Radio.

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**APPENDIX E**  
**RESPONSE TO CREDIBLE INSIDER THREAT**  
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4. NOTIFY department managers to contact Security upon completion of accountability.
5. NOTIFY Security to PERFORM the following:
  - A. ENSURE all vital areas are evacuated using the Security computer system.
  - B. PERFORM sweeps using teams of Security officers using the 2 person rule to verify vital areas are clear of personnel.
6. When notified by Security that Security Defensive Strategies are in place, and that the event has been terminated, Then PERFORM the following:
  - A. Using an announcement similar to the following, RE-MOBILIZE plant personnel using the plant page system:

“ATTENTION ALL PERSONNEL. THE PLANT SECURITY EMERGENCY IS OVER. ALL PERSONNEL REPORT TO YOUR NORMAL WORK STATION OR CONTACT YOUR SUPERVISOR.”
  - B. CONFER with senior plant management to determine any further actions.
  - C. DIRECT Security to PERFORM personnel accountability.

**END OF APPENDIX E**

/R2