

**Attachment 1 - St. Lucie NRC Examination Facility Comments**

Question 32

Unit 2 is performing a cooldown per 2-GOP-305, "Reactor Plant Cooldown - Hot Standby To Cold Shutdown," for a refueling outage with the following conditions:

Time: 11:30

- RCS pressure is 1750 psia
- RCS temperature is 504°F
- 2A & 2B S/Gs are 740 psia

Time: 11:32

- 2A Steam Line ruptures outside Containment and just upstream of the MSIV
- RCS pressure is 1630 psia and rapidly lowering
- SG pressures are 580 psia and rapidly lowering

Which ONE of the following states:

- 1) What ESFAS actuation(s) must be MANUALLY actuated?
- 2) Which procedure will be implemented to mitigate the event?

- A. 1) BOTH MSIS, and SIAS.  
2) 2-EOP-05, "ESDE".
- B. 1) ONLY SIAS.  
2) 2-EOP-05, "ESDE".
- C. 1) BOTH MSIS, and SIAS.  
2) 2-ONP-01.01 "Plant Condition 1 Steam Generator Heat Removal LTOP Not in Effect".
- D. 1) ONLY SIAS.  
2) 2-ONP-01.01 "Plant Condition 1 Steam Generator Heat Removal LTOP Not in Effect".

Answer Key: D

References:

2-GOP-305, "Reactor Plant Cooldown, Hot Standby to Cold Shutdown"

ESFAS system description, 0711401

Main Steam system description, 0711304

Applicant question with proctor response for Q.#32 (copy)

## **Attachment 1 - St. Lucie NRC Examination Facility Comments**

**Comment:** The proper answer to question should be answer selection "C".

The applicant should assume, from the given conditions that at time 11:30, based on plant conditions and the procedure in use, that SIAS has been blocked and MSIS is not blocked due to being above the block permissive setpoint (700 psia). At time 11:32, given plant conditions are as follows:

- RCS pressure is 1630 psia and rapidly lowering
- SG pressures are 580 psia and rapidly lowering

Based on this information, RCS pressure is below the SIAS actuation setpoint of 1736 psia decreasing and SG pressures are below the MSIS actuation setpoint of 600 psia decreasing.

Since SIAS is blocked at the time of the event, the operators must manually actuate SIAS.

Given that SG pressures (plural) are 580 psia and rapidly lowering, this means that MSIS did NOT automatically actuate as designed at 600 psia. If it had actuated, then only the faulted steam generator pressure (2A) would continue to lower and the intact SG pressure (2B) would stabilize since the main steam line break was upstream of the 2A SG MSIV (refer to attached drawing).

Since MSIS did not actuate automatically as designed at 600 psia, the operators must manually actuate MSIS in addition to SIAS.

**FPL Utility Position:** Based on the above discussion, change correct answer to "C" instead of "D".

REVISION NO.: 49	PROCEDURE TITLE: REACTOR PLANT COOLDOWN - HOT STANDBY TO COLD SHUTDOWN ST. LUCIE UNIT 2	PAGE: 16 of 91
PROCEDURE NO.: 2-GOP-305		<u>INITIAL</u>

**4.3 RCS 1750-1800 PSIA; Temperature Greater Than 505°F (continued)**

**NOTE**

Administrative maximum cooldown rate for Pressurizer is 75°F / hr down to 120°F. (Section 7.1.3, Management Directive 12)

**CAUTION**

With less than 4 RCPs in OPERATION, RCS depressurization to less than 1800 psia should be started as soon as possible to minimize differential pressure across seal of idle RCP(s) while **NO** means of seal cooling exists. (Section 7.1.3, Management Directive 9)

- 9. **LOWER** RCS pressure between 1750 and 1800 psia, while maintaining RCS temperature greater than 500°F. (Section 7.1.3, Management Directive 7)
- 10. **PLOT** Pressurizer cooldown on Attachment 13, Reactor Coolant Cooldown System Curve.
- 11. **RECORD** Pressurizer cooldown on Attachment 11, Pressurizer Cooldown.

**NOTE**

- Setpoint for SIAS Block permissive is 1836 psia S / G pressure.
- SIAS BLOCK keyswitch spring returns to normal (left) position.

12. WHEN Annunciator R-8, SIAS CHANNEL A / B ACTUATION-BLOCK PERMISSIVE alarms, THEN **BLOCK** SIAS as follows:
- A. **VERIFY** Annunciator R-8, SIAS CHANNEL A / B ACTUATION BLOCK PERMISSIVE, is IN ALARM.
  - B. **BLOCK** CHANNEL A SIAS as follows:
    - (1) **VERIFY** amber light above SIAS BLOCK CHANNEL A keyswitch is ON.
    - (2) Momentarily **PLACE** SIAS BLOCK CHANNEL A keyswitch in BLOCK position. (Key 99)

REVISION NO.: 49	PROCEDURE TITLE: REACTOR PLANT COOLDOWN - HOT STANDBY TO COLD SHUTDOWN	PAGE: 21 of 91
PROCEDURE NO.: 2-GOP-305	ST. LUCIE UNIT 2	<b>INITIAL</b>

4.4 Preparation for RCS Cooldown (continued)

5. (continued)

F. ENSURE hose installed at V07166, routed to floor drain.

Person notified: \_\_\_\_\_ Time: \_\_\_\_\_

4.5 Commencing RCS Cooldown

**NOTE**

Cooldown for refueling outage will typically require a Chemistry hold up to six hours prior to commencement of cooldown less than 500°F.

1. IF an RCS cooldown has **NOT** yet been started, THEN **START** RCS cooldown per Section 4.3, Step 3.
2. **REDUCE** RCS temperature and pressure using Attachment 13, Reactor Coolant Cooldown System Curve.

**NOTE**

- Setpoint for MSIS Block permissive is 685 psia S / G pressure which corresponds to an RCS temperature of 503°F.
- MSIS Block keyswitch spring returns to normal (left) position.



3. WHEN the following annunciators are IN ALARM, THEN **BLOCK** MSIS:
  - P-18, MSIS CHANNEL A ACTUATION BLOCK PERMISSIVE
  - P-20, MSIS CHANNEL B ACTUATION BLOCK PERMISSIVE

A. **BLOCK** MSIS CHANNEL A as follows: (Key 21)

  - (1) **VERIFY** amber light above MSIS BLOCK CHANNEL A keyswitch is ON.
  - (2) Momentarily **PLACE** MSIS BLOCK CHANNEL A keyswitch to BLOCK position.
  - (3) **VERIFY** red light above MSIS BLOCK CHANNEL A keyswitch is ON.

## SYSTEM DATA

### ESFAS DATA TABLE

<u>SIGNAL</u>	<u>PARAMETER</u>	<u>APPROXIMATE SETPOINT</u>		<u>DESIGN BASES</u>
		<u>UNIT 1</u>	<u>UNIT 2</u>	<u>EVENT</u>
SIAS	LO Pzr Pressure	1600 psia	1736 psia	LOCA
	HI Cntmt Pressure	5.0 psig	3.5 psig	
CIS	HI Cntmt Pressure	5.0 psig	3.5 psig	LOCA
[CIAS]	SIAS Actuation	---	---	
	HI Cntmt Radiation	10 R/hr	10 R/hr	
	(Refueling)	90 mr/hr	90 mr/hr	
MSIS	LO S/G Pressure	600 psia	600 psia	Stm Line Break
	[HI Cntmt Pressure] <span style="color: red;">[U-2 ONLY]</span>	N/A	3.5 psig	
CSAS	HI Cntmt Pressure	10 psig	5.4 psig	LOCA
	with SIAS Actuation	w/SIAS	w/SIAS	Stm Line break
RAS	LO RWT Level	4 ft.	6 ft.	LOCA

DSS*	HI Pzr Pressure	2450 psia	2450 psia	ATWS total loss of FW with No RPS trip
------	-----------------	-----------	-----------	--

**NOTE:** The AFAS-1 and AFAS-2 signals are considered by the FSAR and Technical Specification to be part of the ESFAS. For instructional purposes, due to the difference in flowpath and operational design, they are taught in the AFAS/Auxiliary Feedwater Lesson Text.

Loss of power to safety related buses is addressed in the ESFAS Technical Specifications, but is addressed instructionally in Main Power Distribution text.

- \* The DSS is not an ESFAS signal, but is functionally identical to other ESFAS signals. Since the DSS equipment is located in the ESFAS cabinets, it is described in this text.

2 of 3

# SIMPLIFIED DRAWING OF MAIN STEAM (UNIT 2)

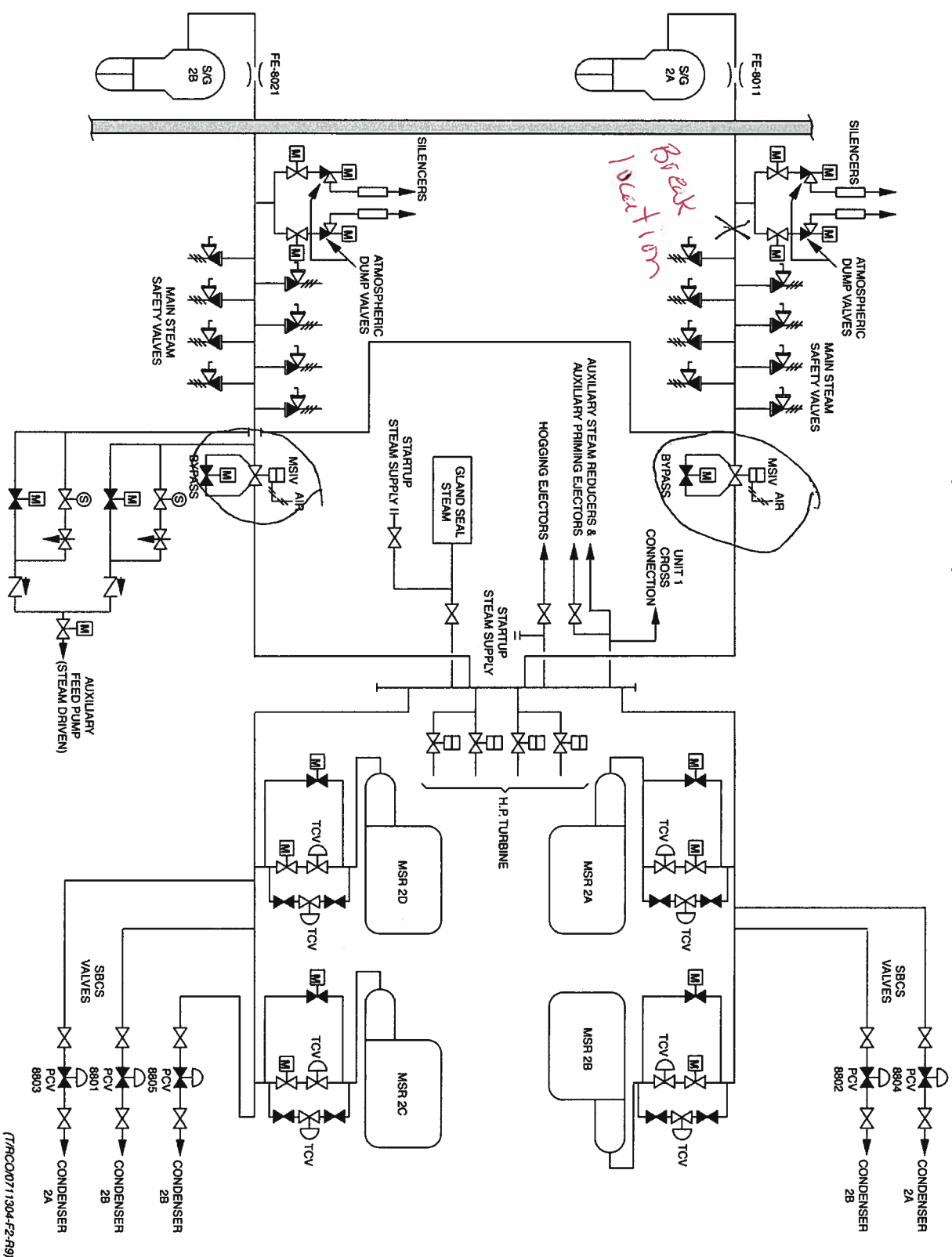


FIGURE 2

(TRCQA0711304-F2-F9)

St. Lucie HLC 22 NRC Exam  
3/18/2015

Question #

Applicant Name

K. Keith

and Question Asked:

32

can I make the assumption  
that no operator actions  
have taken place  
between 11:30 + 11:32

Proctor Response:

added "no operator action was  
taken between time 11:30 & 11:32  
write on board

*over*