

Alabama Power Company  
J. M. Farley Nuclear Plant  
P. O. Drawer 470  
Ashford, Alabama, 36312  
Telephone 205 899-5156

ENCLOSURE 3



Alabama Power  
the southern electric system

February 2, 1990  
FNP-90-0047-TRN

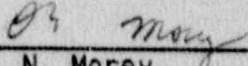
The Regional Administrator, Region II  
Nuclear Regulatory Commission  
101 Marietta Street, N.W.  
Atlanta, GA 30323

ATTN: Mr. John Munro

The enclosed attachments provide Alabama Power Company's Examination Report for the licensed operator requalification written examinations given at Farley Nuclear Plant on January 31, 1990.

For additional information please contact Mr. Lee Williams at (205) 899-5156, extension 6106.

Sincerely,

  
\_\_\_\_\_  
D. N. Morey  
General Manager-Nuclear Plant

Attachments

DNM/LSW:mgr

cc: File

9005230075 900504  
PDR ADOCK 05000348  
V PDR

ATTACHMENT 3  
EXAM KEY MODIFICATIONS

QUESTION: RO-OPEN REF-NRC #7/SRO-OPEN REF-NRC #6

Using EEP-3 (S/G Tube Rupture), determine the correct action to take regarding RCPs for the following plant conditions.

A SGTR has occurred in the 1A S/G, causing an SI, EEP-0 (Rx Trip or SI) and EEP-3 have been completed satisfactorily up to but not including Step 31. All 3 RCPs are running, PZR level is 25%, the SI has been terminated and normal charging and letdown is in service, RCS pressure equals 1A S/G pressure. RCP 1B has a bearing upper/lower oil reservoir low level alarm in, the RCS is within the limits of Figure 1 and off-site power is available. The correct response is to: (Circle the correct response.)

- A. Trip B RCP
- B. Trip B and C RCPs
- C. Trip A and C RCPs
- D. Trip all RCPs and verify adequate natural circ

ANSWER: B (4 minutes)

052302E002

POINTS: 1.00

QUESTION: RO-OPEN REF-NRC #7/SRO-OPEN REF-NRC #6

CHANGE MADE:

Keys changed to reflect that the RCS must be within the limits of Figure 2 vice Figure 1. This was made as a pen & ink change to all examinations during the exam when discovered.

JUSTIFICATION FOR CHANGE:

Correct typographical error.

Step	Action/Expected Response	Response NOT Obtained
— 31.4.2	Seal leakoff flow within Figure 1 limits. — FR-154B — FR-154A	
— 31.4.3	Seal differential pressure greater than 200 psid. — PI-156A (155A, 154A)	
— 31.5	Check sufficient RCP oil level. — RCP 1A (B,C) — BEARING UPPER/LOWER OIL RES — LO LEVEL alarm (H-71, H-72, H-73) — clear	31.5 Do NOT run RCP(s) without sufficient oil.
— 31.5	Check RCS within Figure 2 limits.	31.6 Do NOT run RCP(s) outside Figure 2 limits.
— 31.7	Offsite power and all above support conditions available for at least one RCP.	31.7 Verify all RCPs tripped and adequate natural circulation as follows. — RCP — LA tripped — 1B tripped — 1C tripped
***** CAUTION On natural circulation, RTD bypass manifold temperatures and associated interlocks are inaccurate. *****		
		31.7.1 Steam generator pressures stable or trending down. — PI-474, 475, 476 for SG 1A — PI-484, 485, 486 for SG 1B — PI-494, 495, 496 for SG 1C

QUESTION: RO-OPEN REF-NRC #17/SRO-OPEN REF-NRC #18

Unit One is operating at 100% power when annunciator M71 "FIRE" is received. The unit operator reports that the main control room fire alarm panel indicates "AUX BLDG 121' EAST SIDE" is alarming. The rover is dispatched to the Pyro panel to investigate. The rover reports that fire detection zone "1A-35 ELEV. 121'" is in alarm and will not reset.

- A. What room(s) by number must be investigated to determine the cause of the alarm?
- B. What room(s) by number are Technical Specification applicable?
- C. What room(s) by number are Appendix R applicable?
- D. Is/are the affected area(s) covered by an automatic sprinkler system?

ANSWER: (5 minutes)

- A. 205, 207, 208, 209, 222 (.1 each)
- B. 207, 208, 209 (.25 each)
- C. 207, 208, 209, 222 (.25 each)
- D. Yes (.25)

052521ET1003R

POINTS: 2.50

QUESTION: RO-OPEN REF-NRC #17/SRO-OPEN REF-NRC #18

CHANGE MADE:

Keys answer was expanded to:

B. 207, 208, 209, 222 (.1875 each)

JUSTIFICATION FOR CHANGE:

Answer key was modified to include room 222 in part B such that all Technical Specification applicable rooms are included for full credit. Table 1 of SOP-0.4 lists rooms 207, 208, and 209 as being applicable. Table 3 lists rooms 208, 209, and 222 as being applicable. The complete list of all Technical Specification applicable rooms would then be rooms 207, 208, 209, and 222. Proportional grading applied to key.

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CAUTION

The required fire watches specified in Table 1 assume that there are NO inoperable fire barriers for the affected fire detection zone. Fire watch requirements may be more restrictive if a fire barrier or Kaowool in the affected zone is inoperable.

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FIRE DETECTION ZONE

FIRE WATCH REQUIREMENT

System 1A-34A Elev. 121'

Aux. Non-RCA

Room No.	202 - Communication Room	Hourly**
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System 1A-34B Elev. 121'

Aux. Non-RCA

Room No.	202 - Communication Room	Hourly**
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System 1A-35 Elev. 121'

Aux RCA

Room No.	205 - Corridor	None
	207 - Corridor	Hourly**
	208 - Corridor	Hourly**
	209 - Corridor	Hourly**
	222 - Corridor	Hourly*

Rev. 5

\* Appendix R requirement  
\*\* Tech Spec and Appendix R requirement



TABLE 3

UNIT ONE  
COVERAGE REQUIRED FOR INOPERABLE  
SPRINKLER SYSTEMS

<u>SYSTEM</u>	<u>ROOM NUMBERS/TITLES</u>	<u>TYPE OF FIRE WATCH</u>
1A-21	167 Storage Room	Hourly**
++1A-23	227 Vertical Cable Chase El. 128'-0"	Continuous
	300 Vertical Cable Chase El. 141'-0"	Continuous**
	465 Vertical Cable Chase El. 155'-0"	Hourly
	466 Vertical Cable Chase El. 155'-0"	Continuous**
	500 Vertical Cable Chase El. 168'-6"	Continuous**
++1A-25	161 Corridor	Continuous**
	162 Hallway	Continuous**
	163 WDS Control Panel Rm	Continuous**
	164 L & HS Tank Room	Hourly**
	168 CDT Room	Continuous**
++1A-27	185 CCW Hx Room	Continuous**
++1A-35	208 Corridor	Continuous**
	209 Hallway	Continuous**
	222 Corridor	Continuous**
	207 Corridor	Hourly**

Rev. 7

+Combustible Storage Area.

++Inoperable when the MASTER OVERRIDE switch is in OVERRIDE.

\*Appendix R Requirement

\*\*Tech Spec and Appendix R Requirement

RTYPE: K2.04  
(Individual)

RTYPE: K2.07  
(KEY)

TRAINING DEPARTMENT EXAMINATION

NAME(\*RCVR): KEY GROUP: OPS

\*DATE: 01/31/90

EXAM NUMBER: SRO-OPENREF-NRC

EXAM TITLE: NRC - SRO - OPEN REFERENCE TOTAL POINTS: 22.00  
(\*XREF)

INSTRUCTIONS

1. This is a 2.0 hour examination.
2. Point value for each question is indicated in the question header.
3. Answer all questions:
  - On a separate paper.
  - On the answer sheet by circling or marking the correct response or filling in the blanks.
  - On the same page as the question. If extra room is needed, use the reverse side of the previous page or use extra paper.
4. CHEATING OF ANY KIND IS STRICTLY FORBIDDEN. ANY INDIVIDUAL CAUGHT CHEATING WILL AUTOMATICALLY FAIL THE EXAMINATION AND DISCIPLINARY ACTION WILL BE TAKEN.
5. ALL WORK DONE ON THIS EXAMINATION IS MY OWN. TO MY KNOWLEDGE, I HAVE NEITHER GIVEN NOR RECEIVED AID. FURTHERMORE, I WILL NOT DIVULGE THE CONTENTS OF THIS EXAMINATION TO ANYONE ELSE WHO MAY TAKE IT.

EXAMINEE'S SIGNATURE \_\_\_\_\_

EXAM GRADED BY: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_

GRADING/MATH REVIEW BY: \_\_\_\_\_

APPROVED BY: \_\_\_\_\_

*Randy Higgins*  
Training Manager/  
Supervisor

\*INDEXING INFORMATION

2/24/89

Given the following Unit 1 plant conditions:

- PZR is solid.
- Tav<sub>g</sub> is being maintained constant at 150°F by operation of all three RCPs and RHR train "A," which is operating in the cooldown mode.
- Low pressure letdown is established on "B" train RHR with HCV-142 full open and all three orifice isolation valves open.
- Seal injection to all three RCPs is established at 8 gpm/pump.
- Letdown flow is 120 gpm.
- Charging flow is 115 gpm.
- Operators are attempting to stabilize pressure at 400 psig.

Which of the following would be the result of placing PCV-145 in manual with no further operator action? (Circle the correct response.)

- A. VCT level would increase until LCV-115A diverted.
- B. PRT level would increase, potentially damaging the rupture discs.
- C. RCP minimum #1 seal differential pressure would be lost.
- D. RCS pressure would remain stable.

ANSWER: B. (5 minutes)

Which of the following conditions would PREVENT the manipulator crane trolley from moving. All interlock bypass switches are in OFF. (Circle the correct response.)

- A. The control switch for the hoist is stuck in the raise position
- B. The gripper tube is in the up disengaged position and the gripper is disengaged
- C. The gripper tube is fully up and the gripper disengaged
- D. The bridge is in the upender area

ANSWER: A. (5 minutes)

A tube rupture is known to exist in the A S/G based on pre-SI readings. The level in the A S/G is 15% narrow range and the levels in the B and C S/G are below the narrow range indication. AFW flow to each S/G is 350 gpm and all three AFW pumps are running. EEP-3 is in progress and has been completed satisfactorily up to but not including Step 4.

Determine the correct response to the above conditions.

(Circle the correct response.)

- A. Throttle TDAFW and MDAFW to the B and C S/G to maintain >395 gpm, stop feeding the A S/G.
- B. Stop the TDAFW and throttle MDAFW to the B & C S/Gs to maintain >395 gpm, stop feeding the A S/G.
- C. Throttle TDAFW and MDAFW equally to all S/Gs to maintain >395 gpm.
- D. Throttle TDAFW and MDAFW to any value, the 15% level in the A S/G meets heat sink requirements.

ANSWER: A. (5 minutes)

A SGTR exists, which resulted in an automatic SI actuation on pressurizer pressure. Upon completion of EEP-0 step 23, the operator observes the "B" pressurizer safety valve full open and an uncontrolled level rise in "C" S/G. Select the correct procedure path from the following. (Circle the correct response.)

- A. EEP-0, EEP-3, EEP-1, ECP-3.1
- B. EEP-0, EEP-3, ECP-3.1
- C. EEP-0, EEP-3, EEP-1, ESP-1.2
- D. EEP-0, EEP-3, ECP-3.2

ANSWER: B. (4 minutes)

A S/G tube rupture has occurred. All steps of EEP-0 (Rx Trip or Safety Injection), and EEP-3 up to, but not including, step 14 have been accomplished. The RCS is cooled down to the temperature required for ruptured S/G pressure. All RCPs are running. Due to a failure of an AOV, instrument air is not available to the CTMT. RCS pressure reduction is the next major step.

After evaluating the above plant conditions, determine the required course of action in accordance with EEP-3. Restrict your answer to these items in the procedure.

ANSWER: Go to ECP 3.3. (4 minutes)

Using EEP-3 (S/G Tube Rupture), determine the correct action to take regarding RCPs for the following plant conditions.

A SGTR has occurred in the 1A S/G, causing an SI, EEP-0 (Rx Trip or SI) and EEP-3 have been completed satisfactorily up to but not including step 31. All 3 RCP are running, PZR level is 25%, the SI has been terminated and normal charging and letdown is in service, RCS pressure equals 1A S/G pressure. RCP 1B has a bearing upper/lower oil reservoir low level alarm in, the RCS is within the limits of Figure ~~X~~<sup>2</sup> and off-site power is available. The correct response is to:  
(Circle the correct response.)

- A. Trip B RCP.
- B. Trip B and C RCPs.
- C. Trip A and C RCPs.
- D. Trip all RCPs and verify adequate natural circ.

ANSWER: B. (4 minutes)



Which of the following conditions would require entering FRP-P.1? (Circle the correct response.)

- A. Cooldown < 100° in 60 min., temp 250°, press 520 psig
- B. Cooldown < 100° in 60 min., temp 250°, press 350 psig
- C. Cooldown > 100° in 60 min., temp 275°, press 1800 psig
- D. Cooldown > 100° in 60 min., temp 275°, press 350 psig

ANSWER: A. (4 minutes)

RCS cold leg temperature is now 260°. Two hours ago, the reactor was critical at 100% power; one hour ago, cold leg temperature was 350°. Procedure FRP-P.1 has been completed up to step 19. Which of the following is the correct response to the remaining steps in the procedure: (Circle the correct response.)

- A. Soak required; remain in this procedure until soak is completed. Perform no other actions.
- B. Soak required; remain in this procedure until soak is completed and required 100°/hr cooldown is commenced.
- C. Soak required; go to procedure and step in effect.
- D. No soak required; go to procedure and step in effect.

ANSWER: C. (5 minutes)

With the plant in Mode 3 at 547°, a sustained loss of instrument air is in progress on Unit 1. Due to problems with Unit 2 air system, no air from Unit 2 can be used for Unit 1. All other steps of AOP-6.0 have been completed satisfactorily with the exception of restoration; the charging pump suction is aligned to the VCT. Based on the above conditions, which of the following statements is true concerning PZR level and VCT level? (Circle the correct response.)

- A. VCT level and PZR level increasing
- B. VCT level and PZR level steady
- C. VCT level decreasing and PZR level increasing
- D. VCT level stable and PZR level decreasing

ANSWER: C. (5 minutes)

With all systems in automatic and all lineups normal, the plant is at 100% power, equilibrium conditions. A boration is in progress to allow stepping Bank D rods out to 228 steps. A & B group pressurizer backup heaters are on to borate the pressurizer. An instrument failure has just occurred that caused a penetration room isolation signal to occur. Which of the following would occur as a result, assuming no operator action? (Circle the correct response.)

- A. Pressurizer pressure increase until a reactor trip occurred on high pressure
- B. Pressurizer pressure to increase and stabilize at 2335 on PORVs
- C. Tave to increase due to the reduction in boration flow
- D. Pressurizer level decrease due to the reduction in charging flow

ANSWER: A. (5 minutes)

A refueling accident has occurred in the Unit I spent fuel pool, resulting in a large release of contaminants from the damaged assembly. The following plant conditions also exist:

R-2, 7, and 27A & B indicate pre-event readings.

R-5 alarming.

R-10 trending up but not in alarm.

R-14 and 21 trending up but not in alarm.

R-24A & B indicate pre-event readings.

R-25A & B alarming but slowly trending down.

B-91, B-92, and E-33 annunciators not alarming.

Upon evaluation of the above conditions, you can determine that: (Circle the correct response.)

- A. Peak release from the assembly has occurred since R-25A & B are now trending down.
- B. Spent fuel pool area release is being filtered by the PRF system and monitored by R-10.
- C. A second accident resulting in release of contaminants has occurred in the penetration rooms as evidenced by R-10 trending up.
- D. Containment atmosphere has been affected by the accident in the spent fuel pool as evidenced by R-14 and 21 being upscaled.

ANSWER: B. (5 minutes)

Unit I is operating at 100% power, BOL, steady-state when a penetration room high  $\Delta P$  alarm occurs as evidenced by B-91 and B-92 annunciators in alarm. Only one train of penetration room filtration equipment is able to be started to reduce pressure in the penetration room. No fuel movement or movement of loads in the SFP are scheduled or are in progress. Instrument air to containment is isolated. Pressurizer level is slowly trending up with the present level indicating 65% NR level. Based on the above conditions, what Technical Specification action is required? (Circle the correct response.)

- A. Restore inoperable system within 7 days or be in at least hot shutdown within 6 hours.
- B. Restore inoperable system within 48 hours or be in at least hot standby within 6 hours.
- C. Restore inoperable system within 7 days or be in at least cold shutdown within 30 hours.
- D. Be in at least hot standby with the reactor trip breakers open within 6 hours.

ANSWER: D.

(Reference T.S. 3.4.4)

Unit 1 is shutdown for refueling with fuel movement in progress. The audio count rate selector switch is selected to N-31 and the speaker selector switch is in NORMAL (amplifier 1 supplying the control room speaker and amplifier 2 supplying the containment speaker). An instrument power fuse blows on N-31. The appropriate response would be to:  
(Circle the correct response.)

- A. Continue fuel movement, monitoring the remaining NI channels, select N-32 on the audio count rate selector.
- B. Stop all fuel movement, monitor the remaining NI channels, select N-32 on the audio count rate selector, repair N-31, and then continue fuel movement.
- C. Continue fuel movement, monitor the remaining NI channels, select N-32 on the audio count rate drawer, and then repair N-31.
- D. Stop all fuel movement, monitor the remaining NI channels, select N-32 on the audio count rate selector, continue fuel movement, and then repair N-31.

ANSWER: B. (5 minutes)

Unit 1 is operating at 100% reactor power with Bank D rods at 218 steps when a failure of "C" inverter occurs, deenergizing the "C" 120V vital AC distribution panel. Actions are initiated in accordance with the appropriate ARPs and the Rover is sent to transfer 120V vital AC distribution panel C to the alternate power supply.

- A. How will the operator's ability to manually position control rods in the outward direction be affected during the time the 120V vital AC distribution panel is deenergized? (.25)
- B. How will the operator's ability to manually position control rods in the inward direction be affected during the time the 120V vital AC distribution panel is deenergized? (.25)
- C. What is the reason for any adverse effect, if any, on the operator's ability to manually position control rods? (.5)

ANSWER: (6 minutes)

- A. Manual rod withdrawal is inhibited (.25).  
B. Manual rod insertion is not affected (.25).  
C. Hi flux rod stop (N-43 deenergized) (.5).



A Unit One heatup is in progress following a refueling outage in accordance with UOP-1.1, "Startup of Unit from Cold Shutdown to Hot Standby." Keff is .975, RCS temperature is 348° F, and the shutdown banks are being withdrawn. State the nuclear instrumentation channel(s) by instrument number that is(are) required to be operable based on the above plant conditions in order to enter the next higher mode.

ANSWER: (.25 ea.) (5 minutes)

N-31 & N-32  
N-35 & N-36

Based on the following conditions, answer the question below:

- Unit in Mode 3.
- Tavg is 547°F.
- Fire has occurred in the cable spreading room.
- Fire resulted in loss of the following MCB indications and control:
  - Normal charging
  - Normal letdown
  - Seal injection
- Control has been shifted to the HSD panels.
- Orifice isolation valve 8149A has been opened from the HSD panel.

Describe how letdown flow rate can be determined. Be specific about which parameter(s) is(are) and where the parameter(s) can be obtained from based on the above stated conditions. (Instrument numbers are not required.)

ANSWER: (Grader discretion required) (5 minutes)

Perform a flow balance on CVCS system to include:

Seal injection flow (.2) from penetration room indications (.2).

Charging flow (.2) from HSD panel indications (.2)

PZR level (.2) from MCB or HSD panels (not required for full credit)

VCT level from MCB or BTRS chiller room (not required for full credit)

The control room has been evacuated and is inaccessible due to a fire in the control room. The plant was tripped and control has been established at the HSD panels. The WR T<sub>c</sub> instrument at the HSD panels has failed low. The following stable HSD panel indications exist:

S/G level	A-62%	B-63%	C-62%
S/G press	A-910 psig	B-910 psig	C-910 psig
Charging flow	70 gpm		
PZR press	2260 psig		
PZR level	25%		
WR T <sub>h</sub>	565°F		
WR T <sub>c</sub>	Failed low		
CST	> 11 feet		
Neutron flux	300 cps		

- A. Using the above AVAILABLE HSD panel indications, state what indication(s) would be used to determine that natural circulation is established, per the controlling procedure for this event.

- B. State if natural circulation is established for the above plant conditions.

ANSWER: (5 minutes)

- A. WR T<sub>h</sub> (.5) and S/G T<sub>sat</sub> (.5).  
B. Yes, natural circ is established (.5).

Unit One is operating at 100% power when annunciator M71 "FIRE" is received. The unit operator reports that the main control room fire alarm panel indicates "AUX BLDG 121' EAST SIDE" is alarming. The rover is dispatched to the Pyro panel to investigate. The rover reports that fire detection zone "1A-35 ELEV. 121'" is in alarm and will not reset.

- A. What room(s) by number must be investigated to determine the cause of the alarm?
  
- B. What room(s) by number are Technical Specification applicable?
  
- C. What room(s) by number are Appendix R applicable?
  
- D. Is/are the affected area(s) covered by an automatic sprinkler system?

ANSWER: (5 minutes)

- A. 205, 207, 208, 209, 222 (.1 ea.)
- B. 207, 208, 209 (~~.25 ea.~~), 222 (.1875 ea)
- C. 207, 208, 209, 222 (.25 ea.)
- D. Yes (.25)

Evaluate the following plant conditions in order to classify the event:

Bypass and Permissive Panel "SAFETY INJECTION ACTUATED" light is ON

SI FLOW TO COLD LEG HDR, FI-943 indicates  $.35 \times 10^3$  gpm

MCB annunciators M-41, M-42, M-43, and M-44 are alarming (in solid)

S/U Transformer breakers DF01 and DG15 are tripped

SJAE exhaust RR-15 indicates  $9 \times 10^5$

SJAE exhaust R-15 indicates  $1 \times 10^6$  gpm

Which of the following is the MINIMUM classification for the event? (Circle the correct response.)

- A. Site Area
- B. Alert
- C. NOUE
- D. One-hour non-emergency

ANSWER: A. (5 minutes)

A system operator working in Containment fell from some scaffolding and fractured his arm. Health Physics personnel report that the SO is also contaminated. Which of the following BEST describes the required notifications that should be made. (Circle the correct response.)

- A. Emergency Director, Recovery Manager, NRC, Security
- B. Operations Manager, Emergency Director, Recovery Manager, NRC, Security
- C. Emergency Director, Recovery Manager, Alabama Bureau of Radiological Health, Georgia Emergency Management Agency, NRC, Security
- D. Emergency Director, Recovery Manager, Alabama Bureau of Radiological Health, NRC, Security

ANSWER: C. (5 minutes)

Basis: EIP-11, 3.5  
EIP-17, 3.2.11  
EIP-26, 5.3

01/31/90

ALABAMA POWER COMPANY

EXAM GRADING SHEET

EXAM NAME: SRO-OPENREF-NRC

CLASS NAME: LRP-89

TOTAL POINTS: 22.00

DATE GIVEN: 01/31/90

STUDENT ID / NAME: \*\* DRAFT \*\* / \*\*\*\*\* DRAFT \*\*\*\*\*

QUEST #	POINT VALUE	POINTS MISSED	QUEST #	POINT VALUE	POINTS MISSED
1 - 052101FT1042R	1.00	_____	_____	_____	_____
2 - 052108DT1017R	1.00	_____	_____	_____	_____
3 - 052302B007	1.00	_____	_____	_____	_____
4 - 052302B08031	1.00	_____	_____	_____	_____
5 - 052302E001	1.00	_____	_____	_____	_____
6 - 052302E002	1.00	_____	_____	_____	_____
7 - 052302F01043	1.00	_____	_____	_____	_____
8 - 052302F03053	1.00	_____	_____	_____	_____
9 - 052520FT1001R	1.00	_____	_____	_____	_____
10 - 052520NT1002R	1.00	_____	_____	_____	_____
11 - 052520NT1010R	1.00	_____	_____	_____	_____
12 - 052520NT1012R	1.00	_____	_____	_____	_____
13 - 052520RT1001R	1.00	_____	_____	_____	_____
14 - 052520RT1003R	1.00	_____	_____	_____	_____
15 - 052520RT1024R	1.00	_____	_____	_____	_____
16 - 052521CT1001R	1.00	_____	_____	_____	_____
17 - 052521DT1001R	1.50	_____	_____	_____	_____
18 - 052521ET1003R	2.50	_____	_____	_____	_____
19 - 053002A01004	1.00	_____	_____	_____	_____
20 - 053002A01005	1.00	_____	_____	_____	_____
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_____	_____	_____	_____	_____	_____

TOTAL POINTS MISSED: \_\_\_\_\_ FINAL SCORE: \_\_\_\_\_

RTYPE: K2.04  
(Individual)

RTYPE: K2.07  
(KEY)

TRAINING DEPARTMENT EXAMINATION

NAME(\*RCVR): KEY GROUP: OPS

\*DATE: 01/31/90

EXAM NUMBER: RO-OPENREF-NRC

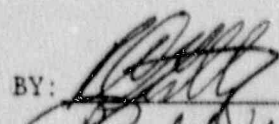
EXAM TITLE: NRC - RO - OPEN REFERENCE TOTAL POINTS: 21.00  
(\*XREF)

INSTRUCTIONS

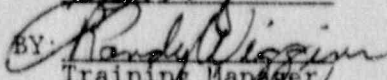
1. This is a 2.0 hour examination.
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  - On the answer sheet by circling or marking the correct response or filling in the blanks.
  - On the same page as the question. If extra room is needed, use the reverse side of the previous page or use extra paper.
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EXAMINEE'S SIGNATURE \_\_\_\_\_

EXAM GRADED BY: \_\_\_\_\_

PREPARED BY: 

GRADING/MATH REVIEW BY: \_\_\_\_\_

APPROVED BY: 

Training Manager/  
Supervisor

\*INDEXING INFORMATION

2/24/89



Given the following Unit 1 plant conditions:

- PZR is solid.
- Tavg is being maintained constant at 150°F by operation of all three RCPs and RHR train "A," which is operating in the cooldown mode.
- Low pressure letdown is established on "B" train RHR with HCV-142 full open and all three orifice isolation valves open.
- Seal injection to all three RCPs is established at 8 gpm/pump.
- Letdown flow is 120 gpm.
- Charging flow is 115 gpm.
- Operators are attempting to stabilize pressure at 400 psig.

Which of the following would be the result of placing PCV-145 in manual with no further operator action? (Circle the correct response.)

- A. VCT level would increase until LCV-115A diverted.
- B. PRT level would increase, potentially damaging the rupture discs.
- C. RCP minimum #1 seal differential pressure would be lost.
- D. RCS pressure would remain stable.

ANSWER: B. (5 minutes)

Unit 1 reactor power is presently at 2% and holding while the Unit Operator is making preparations to start up the 1B SGFP. Annunciator L54, "AIR SIDE SEAL OIL PUMP OFF," alarms. Upon investigation, it is determined that the pump has tripped on overload. The DC air side emergency seal oil pump did not start automatically and would not start on a manual attempt by the operator. Based on this information, which of the following is required to be performed? (Circle the correct response.)

- A. Stop the hydrogen side seal oil pump.
- B. Verify the seal oil backup pump running.
- C. Reduce hydrogen pressure to 5 psig.
- D. Immediately trip the main generator.

ANSWER: (4 minutes)(1.0)

B.

A tube rupture is known to exist in the A S/G based on pre-SI readings. The level in the A S/G is 15% narrow range and the levels in the B and C S/G are below the narrow range indication. AFW flow to each S/G is 350 gpm and all three AFW pumps are running. EEP-3 is in progress and has been completed satisfactorily up to but not including Step 4.

Determine the correct response to the above conditions.

(Circle the correct response.)

- A. Throttle TDAFW and MDAFW to the B and C S/G to maintain >395 gpm, stop feeding the A S/G.
- B. Stop the TDAFW and throttle MDAFW to the B & C S/Gs to maintain >395 gpm, stop feeding the A S/G.
- C. Throttle TDAFW and MDAFW equally to all S/Gs to maintain >395 gpm.
- D. Throttle TDAFW and MDAFW to any value, the 15% level in the A S/G meets heat sink requirements.

ANSWER: A. (5 minutes)

A SGTR exists, which resulted in an automatic SI actuation on pressurizer pressure. Upon completion of EEP-0 step 23, the operator observes the "B" pressurizer safety valve full open and an uncontrolled level rise in "C" S/G. Select the correct procedure path from the following. (Circle the correct response.)

- A. EEP-0, EEP-3, EEP-1, ECP-3.1
- B. EEP-0, EEP-3, ECP-3.1
- C. EEP-0, EEP-3, EEP-1, ESP-1.2
- D. EEP-0, EEP-3, ECP-3.2

ANSWER: B. (4 minutes)

A large steam break exists on the "B" S/G inside CTMT.

Select the correct procedure path from the following.

(Circle the correct response.)

- A. EEP-0, EEP-2, EEP-1, ESP-1.1
- B. EEP-0, EEP-1, EEP-2, EEP-1, ESP-1.1
- C. EEP-0, EEP-2, EEP-1, ESP-1.3
- D. EEP-0, EEP-1, EEP-2, EEP-1, ESP-1.3

ANSWER:  A. (5 minutes)

A S/G tube rupture has occurred. All steps of EEP-0 (Rx Trip or Safety Injection), and EEP-3 up to, but not including, step 14 have been accomplished. The RCS is cooled down to the temperature required for ruptured S/G pressure. All RCPs are running. Due to a failure of an AOV, instrument air is not available to the CTMT. RCS pressure reduction is the next major step.

After evaluating the above plant conditions, determine the required course of action in accordance with EEP-3. Restrict your answer to those items in the procedure.

ANSWER: Go to ECP 3.3. (4 minutes)

Using EEP-3 (S/G Tube Rupture), determine the correct action to take regarding RCPs for the following plant conditions.

A SGTR has occurred in the 1A S/G, causing an SI, EEP-0 (Rx Trip or SI) and EEP-3 have been completed satisfactorily up to but not including step 31. All 3 RCPs are running, PZR level is 25%, the SI has been terminated and normal charging and letdown is in service, RCS pressure equals 1A S/G pressure. RCP 1B has a bearing upper/lower oil reservoir low level alarm in, the RCS is within the limits of Figure <sup>2</sup>X and off-site power is available. The correct response is to:  
(Circle the correct response.)

- A. Trip B RCP.
- B. Trip B and C RCPs.
- C. Trip A and C RCPs.
- D. Trip all RCPs and verify adequate natural circ.

ANSWER: B. (4 minutes)

A SGTR has occurred, causing an SI. EEP-0 was completed and EEP-3 entered. The ruptured S/G was identified as B S/G and isolated. A cooldown was completed from 547 degrees to 493 degrees, RCS pressure 1500 psig and has not yet been reduced to terminate the SI, and flow into the RCS is still through the BIT. The following information is reported:

CTMT pressure and radiation levels are the same as pre-event readings, PZR level is 2%, S/G A and C are both at saturation press for existing RCS temperature (600 psig), B S/G 1100 psig.

Based on the above information, state any action required by the EEP-3 foldout page. Restrict your answer to foldout page information only.

ANSWER: None. (5 minutes)(No deduction for monitoring activities stated.)



Which of the following conditions would require entering FRP-P.1? (Circle the correct response.)

- A. Cooldown < 100° in 60 min., temp 250°, press 520 psig
- B. Cooldown < 100° in 60 min., temp 250°, press 350 psig
- C. Cooldown > 100° in 60 min., temp 275°, press 1800 psig
- D. Cooldown > 100° in 60 min., temp 275°, press 350 psig

ANSWER: A. (4 minutes)

RCS cold leg temperature is now 260°. Two hours ago, the reactor was critical at 100% power; one hour ago, cold leg temperature was 350°. Procedure FRP-P.1 has been completed up to step 19. Which of the following is the correct response to the remaining steps in the procedure: (Circle the correct response.)

- A. Soak required; remain in this procedure until soak is completed. Perform no other actions.
- B. Soak required; remain in this procedure until soak is completed and required 100°/hr cooldown is commenced.
- C. Soak required; go to procedure and step in effect.
- D. No soak required; go to procedure and step in effect.

ANSWER: C. (5 minutes)

With the plant in Mode 3 at 547°, a sustained loss of instrument air is in progress on Unit 1. Due to problems with Unit 2 air system, no air from Unit 2 can be used for Unit 1. All other steps of AOP-6.0 have been completed satisfactorily with the exception of restoration; the charging pump suction is aligned to the VCT. Based on the above conditions, which of the following statements is true concerning PZR level and VCT level? (Circle the correct response.)

- A. VCT level and PZR level increasing
- B. VCT level and PZR level steady
- C. VCT level decreasing and PZR level increasing
- D. VCT level stable and PZR level decreasing

ANSWER: C. (5 minutes)

With all systems in automatic and all lineups normal, the plant is at 100% power, equilibrium conditions. A boration is in progress to allow stepping Bank D rods out to 228 steps. A & B group pressurizer backup heaters are on to borate the pressurizer. An instrument failure has just occurred that caused a penetration room isolation signal to occur. Which of the following would occur as a result, assuming no operator action? (Circle the correct response.)

- A. Pressurizer pressure increase until a reactor trip occurred on high pressure
- B. Pressurizer pressure to increase and stabilize at 2335 on PORVs
- C. Tave to increase due to the reduction in boration flow
- D. Pressurizer level decrease due to the reduction in charging flow

ANSWER: A. (5 minutes)

A refueling accident has occurred in the Unit I spent fuel pool, resulting in a large release of contaminants from the damaged assembly. The following plant conditions also exist:

R-2, 7, and 27A & B indicate pre-event readings.

R-5 alarming.

R-10 trending up but not in alarm.

R-14 and 21 trending up but not in alarm.

R-24A & B indicate pre-event readings.

R-25A & B alarming but slowly trending down.

B-91, B-92, and E-33 annunciators not alarming.

Upon evaluation of the above conditions, you can determine that: (Circle the correct response.)

- A. Peak release from the assembly has occurred since R-25A & B are now trending down.
- B. Spent fuel pool area release is being filtered by the PRF system and monitored by R-10.
- C. A second accident resulting in release of contaminants has occurred in the penetration rooms as evidenced by R-10 trending up.
- D. Containment atmosphere has been affected by the accident in the spent fuel pool as evidenced by R-14 and 21 being upscaled.

ANSWER: B. (5 minutes)

Unit 1 is operating at 100% reactor power with Bank D rods at 218 steps when a failure of "C" inverter occurs, deenergizing the "C" 120V vital AC distribution panel. Actions are initiated in accordance with the appropriate ARPs and the Rover is sent to transfer 120V vital AC distribution panel C to the alternate power supply.

- A. How will the operator's ability to manually position control rods in the outward direction be affected during the time the 120V vital AC distribution panel is deenergized? (.25)
- B. How will the operator's ability to manually position control rods in the inward direction be affected during the time the 120V vital AC distribution panel is deenergized? (.25)
- C. What is the reason for any adverse effect, if any, on the operator's ability to manually position control rods? (.5)

ANSWER: (6 minutes)

- A. Manual rod withdrawal is inhibited (.25).  
B. Manual rod insertion is not affected (.25).  
C. HI flux rod stop (N-43 deenergized) (.5).

Based on the following conditions, answer the question below:

- Unit in Mode 3.
- Tavg is 547°F.
- Fire has occurred in the cable spreading room.
- Fire resulted in loss of the following MCB indications and control:
  - Normal charging
  - Normal letdown
  - Seal injection
- Control has been shifted to the HSD panels.
- Orifice isolation valve 8149A has been opened from the HSD panel.

Describe how letdown flow rate can be determined. Be specific about which parameter(s) is(are) and where the parameter(s) can be obtained from based on the above stated conditions. (Instrument numbers are not required.)

ANSWER: (Grader discretion required) (5 minutes)

Perform a flow balance on CVCS system to include:

Seal injection flow (.2) from penetration room indications (.2).

Charging flow (.2) from HSD panel indications (.2)

PZR level (.2) from MCB or HSD panels (not required for full credit)

VCT level from MCB or BTRS chiller room (not required for full credit)

The control room has been evacuated and is inaccessible due to a fire in the control room. The plant was tripped and control has been established at the HSD panels. The WR T<sub>c</sub> instrument at the HSD panels has failed low. The following stable HSD panel indications exist:

S/G level	A-62%	B-63%	C-62%
S/G press	A-910 psig	B-910 psig	C-910 psig
Charging flow	70 gpm		
PZR press	2260 psig		
PZR level	25%		
WR T <sub>h</sub>	565°F		
WR T <sub>c</sub>	Failed low		
CST	> 11 feet		
Neutron flux	300 cps		

- A. Using the above AVAILABLE HSD panel indications, state what indication(s) would be used to determine that natural circulation is established, per the controlling procedure for this event.

- B. State if natural circulation is established for the above plant conditions.

ANSWER: (5 minutes)

- A. WR T<sub>h</sub> (.5) and S/G T<sub>sat</sub> (.5).  
B. Yes, natural circ is established (.5).



Unit One is operating at 100% power when annunciator M71 "FIRE" is received. The unit operator reports that the main control room fire alarm panel indicates "AUX BLDG 121' EAST SIDE" is alarming. The rover is dispatched to the Pyro panel to investigate. The rover reports that fire detection zone "1A-35 ELEV. 121'" is in alarm and will not reset.

- A. What room(s) by number must be investigated to determine the cause of the alarm?
- B. What room(s) by number are Technical Specification applicable?
- C. What room(s) by number are Appendix R applicable?
- D. Is/are the affected area(s) covered by an automatic sprinkler system?

ANSWER: (5 minutes)

- A. 205, 207, 208, 209, 222 (.1 ea.)
- B. 207, 208, 209 (~~.25 ea.~~), 222 (.1875 ea.)
- C. 207, 208, 209, 222 (.25 ea.)
- D. Yes (.25)

Unit One has experienced a loss of reactor coolant and EEP-1 is in progress. Using the following data, determine the correct reference power setting for the Post-LOCA H<sub>2</sub> Recombiner.

Pre-LOCA Containment conditions

- Temperature 90°F
- Pressure 0 psig

Post-LOCA Containment conditions

- Temperature 120°F
- Pressure 8 psig

ANSWER: (1.0) (4 minutes)

61 +/- 2 kw

(Figure 1, EEP-1)

At step 1 of EEP-1 (Loss of Reactor or Secondary Coolant), the STA reports the following information:

Adverse CTMT conditions exist and are being monitored. RCS pressure is 1250 psig. RWST level is 21 feet. Core exit thermocouple temperatures are 680°F. Subcooling monitor by core exit thermocouples indicates 50° subcooled. SG "B" level is going up faster than "C" or "A" SG, but R-15s, R-60s, and R-23s are not in alarm. AFW flow to all SGs is the same.

State the action(s) required. Restrict your answer to foldout page information only.

ANSWER: (5 minutes)  
Verify miniflow valves shut (.5)  
Go to EEP-3 (.5)  
(No deduction for monitoring activities stated.)



RTYPE: K2.04  
(Individual)

RTYPE: K2.07  
(KEY)

TRAINING DEPARTMENT EXAMINATION

NAME(\*RCVR): KEY GROUP: OPS

\*DATE: 01/31/90

EXAM NUMBER: SRO-SS-ABN-NRC

EXAM TITLE: NRC - SRO - ABNORMAL/STATIC TOTAL POINTS: 13.50  
(\*XREF)

INSTRUCTIONS

1. This is a 1.0 hour examination.
2. Point value for each question is indicated in the question header.
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EXAMINEE'S SIGNATURE \_\_\_\_\_

EXAM GRADED BY: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_

GRADING/MATH REVIEW BY: \_\_\_\_\_

APPROVED BY: \_\_\_\_\_

*Randall Rogers*  
Training Manager/  
Supervisor

\*INDEXING INFORMATION

2/24/89

# STATIC SIMULATOR EXAM SCENARIO

DATE 900131

PREPARED BY R. C. Lulling

SCENARIO NO SS-ABN1.NRC

IC NO 7

EVENT TYPE ABNORMAL (AOP19-1.SCN)

## TASK NO.            TASK DESCRIPTION

CRO-5033            Perform corrective actions in response to a malfunction of the rod control system.

CRO-5379            Apply action statement of Technical Specifications.

## SCENARIO DESCRIPTION

Initialize at 100% power, BOL, with rods in manual. Initiate a dropped rod malfunction with no reactor trip occurring or required.

## SIMULATOR SETUP

- Initiate MALF CRW-15A, stationary coil, rod F6
- Acknowledge all annunciators that alarm and/or clear
- Allow 15 minutes run time to stabilize Tavg, pressure, etc. (900 sec)
- FRZ simulator
- Initiate exam

## GOALS

1. Determine the correct method for restoring RCS Tavg to program value.  
CRO-5033 S/K 240122020405 K/A 000003EA1.05 4.1/4.1
2. Determine the reactivity worth of a dropped rod.  
CRO-5033 S/K 240122020430 K/A 000003EK1.03 3.5/3.8
3. Explain the consequences of improperly withdrawing a dropped rod.  
CRO-5033 S/K 240122020440 K/A 000003EK1.01 3.2/3.7
4. Explain the interrelation of the lift coil disconnect switches with the rod control urgent failure alarm.  
CRO-5033 S/K 240109020100 K/A 001050A2.01 3.7/3.9
5. Determine if a negative rate trip exists on a power range drawer.  
CRO-5033 S/K 241540020400 K/A 015000A3.01 3.8/3.8
6. Determine the correct Technical Specification action requirement.  
CRO-5033 S/K 240105020080 K/A 000003 generic 8 3.3/3.9  
S/K 240122020490 K/A 000003EK3.08 3.1/4.2

STATIC SIMULATOR EXAM SCENARIO

DATE 900131

PREPARED BY R. C. Lulling

SCENARIO NO. SS-ABN2.NRC

IC NO. 7

EVENT TYPE ABNORMAL (AOP33-1.SCN)

TASK NO.            TASK DESCRIPTION

CRO-5413            Perform corrective actions in response to a high alarm of the radiation monitoring system.

SCENARIO DESCRIPTION

Initialize in any plant condition. Initiate an RMS malfunction.

SIMULATOR SETUP

- Verify multipoint recorders on for 15 min prior to RMS malfunction
- Initiate MALF RMS-2K; 1E6 cpm, no ramp
- Acknowledge all annunciators that alarm
- FRZ simulator
- Initiate exam

GOALS

1. Verify the validity of a process effluent monitor alarm.  
CRO-5413 S/K 247309020500 K/A 073000A4.02 3.7/3.7
2. Determine the source or cause of high activity utilizing control room indications.  
CRO-5413 S/K 247309020120 K/A 073000A1.01 3.2.3.5
3. Determine if failed process radiation monitor is Technical Specification related.  
CRO-5413 S/K 247304020120 K/A 073000 generic 11 2.8/3.4

STATIC SIMULATOR EXAM SCENARIO

SCENARIO NO. SS-ABN1.NRC/SS-ABN2.NRC IC NO. 7

EVENT TYPE ABNORMAL

INITIAL CONDITIONS

Time: 5 minutes

Unit I was at 100% power steady state, equilibrium conditions when the indicated abnormal event occurred. There were no LCO's or inoperable equipment prior to this event.



The unit is operating at 100% power with main generator load at 867 MWs. The unit operator notices that the DEHC system has automatically transferred to manual. Based on these plant conditions, what are two(2) possible causes of the DEHC system transferring to manual?

ANSWER: (.5 pts. each) (5 minutes)

- A. A loss of 120V AC to the operator auto controllers (also accept: a loss of 120V AC to DEHC)
- B. A failure of both operator auto controllers

A complete loss of instrument air has occurred and the operator tripped the reactor from 100% power. Ten minutes later, the operator attempted to stop the TDAFW pump by shutting the steam admission valves from the MCB. The TDAFW pump would not stop. Which of the following is the cause?

(Circle the correct response.)

- A. Steam admission valves from B & C loops are failed open due to loss of instrument air.
- B. Common steam admission valve in main steam valve room is failed open due to B S/G steam supply valve being in local.
- C. Both main feed pumps tripped.
- D. All S/G levels out of narrow range.

ANSWER: D. (4 minutes)

Unit 1 is in Mode 5 with the RCS at 178°F and 375 psig. A bubble is being drawn in accordance with UOP-1.1, "Startup of Unit from Cold Shutdown to Hot Standby." Excess letdown has been placed in service to expedite drawing the bubble. All initial conditions have been met with one RCDT pump running and the other in pull-to-lock. The recycle evaporator is running and processing the #1 RHT. The CCW system is aligned with the "C" pump running through the "C" heat exchanger. The Unit Operator notices that R-17B readings are starting to increase and that CCW surge tank level has increased 4 inches since the last set of log readings. Based on the above stated plant conditions, determine three(3) potential sources of inleakage to the CCW system.

ANSWER: Any three(3) of the following for .5 each. (5 minutes)

- LTDN heat exchanger
- Excess letdown heat exchanger
- RHR heat exchanger
- RCP thermal barrier
- RCDT heat exchanger
- Charging pump seals
- RHR pump seals

(Minus .25 for sources beyond three that will not result in inleakage or upscale R-17B readings for the stated plant conditions.)

If the dropped rod will not move due to electrical problems and cannot be recovered, then which of the following actions is correct? (Circle the correct response.)

- A. Continue operation according to Technical Specification 3.1.3.1 action d.3.
- B. Be in hot standby within 6 hours according to Technical Specification 3.1.3.1 action a.
- C. Be in hot standby within 6 hours according to Technical Specification 3.1.3.1 action b.
- D. Maintain power level and align the remaining rods to within  $\pm 12$  steps within 1 hour.

ANSWER: AOP19-1.SCN (5 minutes)

A.

Following the dropped rod, the operators restored Tav<sub>g</sub> to program by operation of the turbine controls. Final power level after Tav<sub>g</sub> was restored to program was 86%. Prior to recovering the dropped rod in accordance with AOP-19, power level should be: (Circle the correct response.)

- A. Maintained at 86%
- B. Increased to 95%
- C. Reduced to 81%
- D. Reduced to 72%

ANSWER: AOP19-1.SCN (5 minutes)

C

A "rod recovery" is in progress and has been performed satisfactorily up to but not including step 5.4.5. Describe the method that you would use to determine the reactivity worth of the dropped rod. (Actual calculation is not required.)

ANSWER: AOP19-1.SCN (4 minutes)(SRO only)

(Accept other answers on a case-by-case basis which determine the worth of the dropped rod.)

Determine the difference in the power defect for the two power levels (1.0).

OR

Determine the difference in the power defect for the power levels, taking into account the effect of any boron dilution performed.

While recovering the dropped rod, the operator is directed to "zero the pulse to analog converter." If the operator failed to perform this step of the procedure, what, if any, effect(s) will this have following the dropped rod recovery on plant operation?

ANSWER: AOP19-1.SCN (4 minutes)(SRO only)

RIL computer will show rods higher than actual (1.0)  
(or an equivalent statement).

During the recovery, step 5.4.15 of "the rod recovery procedure" was inadvertently omitted. All other steps were completed according to procedure. When the OATC placed rod control in MANUAL to adjust Tavg to within  $\pm 1^\circ\text{F}$  of Tref, there was no rod motion. Which of the following is the cause of the rods failing to move: (NOTE: No other problems exist in rod control except for omitting step 5.4.15.)(Circle the correct response.)

- A. Logic cabinet urgent failure
- B. Power cabinet urgent failure
- C. Bank D rods are indicating greater than 220 steps, preventing outward rod motion
- D. Negative rate rod stop

ANSWER: AOP19-1.SCN (5 minutes)(SRO only)

B.



1. Calculate the present Quadrant Power Tilt Ratio (QPTR).  
QPTR =
  
  
  
  
  
  
  
  
  
  
2. Based on the calculated QPTR, which of the following actions should be taken: (Circle the correct response)
  - A. No action required based on calculated QPTR.
  - B. Calculate the QPTR at least once per hour until the QPTR is reduced to within its limits.
  - C. Take actions to correct and verify that QPTR is within its limit within 2 hours after exceeding or reduce thermal power < 50% within the next 2 hours.
  - D. Take actions to correct and verify that QPTR is within its limit within 24 hours after exceeding or reduce thermal power < 50% within the next 2 hours.

ANSWER: (AOP19-1.SCN)(12 minutes)(2.0)

1. QPTR =  $1.007 \pm .001$  (1.0)
2. A. (1.0)(Multiple choice answer should be based on calculated QPTR value.)

Which of the following conditions would you expect to observe if this dropped rod event occurred at EOL? (Circle the correct response.)

- A. Smaller increase in Tavg
- B. Smaller decrease in Tavg
- C. Greater increase in Tavg
- D. Greater decrease in Tavg

ANSWER: AOP19-1.SCN (1.0)(4 minutes)

B.

- A. List at least four(4) plant parameters or indications you would use in determining if the RMS alarm is due to an instrument failure. (1.0)
- B. YES or NO: Have all actions occurred that should have for this alarm condition? (Circle the correct answer.)(1.0)

ANSWER: AOP33-1.SCN (2.0) (5 minutes)

- A. Any four(4) of the following for .25 each
- CCW surge tank levels unchanged
  - "B" train CCW not in service
  - Multipoint recorder step change
  - Charging flow unchanged
  - VCT level unchanged
  - RMS meter pegged high
  - Both high and low alarm lights lit
  - Chemistry sample indicates no activity
  - Annunciator F-72 alarming
  - Front panel indication not indicating per SOP
- B. YES (1.0)



RTYPE: K2.04  
(Individual)

RTYPE: K2.07  
(KEY)

TRAINING DEPARTMENT EXAMINATION

NAME(\*RCVR): KEY GROUP: OPS

\*DATE: 01/31/90

EXAM NUMBER: SRO-SS-EMER-NRC

EXAM TITLE: NRC - SRO - EMERGENCY STATI TOTAL POINTS: 12.50  
(\*XREF)

INSTRUCTIONS

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EXAM GRADED BY: \_\_\_\_\_

PREPARED BY: [Signature]

GRADING/MATH REVIEW BY: \_\_\_\_\_

APPROVED BY: [Signature]  
Training Manager/  
Supervisor

\*INDEXING INFORMATION

2/24/89

# STATIC SIMULATOR EXAM SCENARIO

DATE 900131 PREPARED BY R. C. Lulling  
SCENARIO NO. SS-ERPL.NRC IC NO. 7  
EVENT TYPE EMERGENCY

<u>TASK NO.</u>	<u>TASK DESCRIPTION</u>
CRO-5406	Perform required actions for Rx trip with SI.
CRO-5357	Perform required actions in response to a loss of secondary coolant.

## SCENARIO DESCRIPTION

The plant is initially at 100% steady-state with a MDAFW pump inoperable and red tagged, repairs expected to be complete in 12 hours. A 4E6 stm line break on B S/G inside CTMT causes an automatic Rx trip, SI, and main stm line isolation. CTMT pressure is > 4 psig, causing adverse CTMT conditions. On the SI, phase A isolation valve 8152 (LTDN isolation) and valves 8107 and 8108 (charging isolation valves) fail to close. The simulator is frozen at this time.

## SIMULATOR SETUP

- Init at 100% in IC 7
- Fail valve 8152 open (MALF-CVC5)
- Fail valves 8107 and 8108 open (C-CHGM7=5; CHGM8=5)
- Trip B MDAFW pump (MALF-FWM 1B)
- Tag out a MDAFW pump (C-AFWP1=4)
- Activate steam line break on B S/G inside CTMT (MALF-MSS1B 4E6, 100 sec ramp)
- Verify Rx trip, SI, and MSLIAS
- Stop minipurge fan
- Place feed reg valve controllers in MAN and shut
- Verify post-LOCA mixing fans and H<sub>2</sub> dilution fans running
- Verify CTMT pressure > 4 psig but < 27 psig (i.e. NO CTMT Spray actuation)
- Verify LCV-1003 closed
- Acknowledge Subcooled Margin Monitors
- FRZ simulator (Prior to CTMT spray actuation!)
- Make the following log entry:
  - "A MDAFW PUMP inoperable due to motor connections; repairs expected to be complete in 12 hours; LCO is written."
- Start exam

## GOALS

1. Verification that a phase A isolation has occurred per attachment 1 of EEP-0.  
CRO-5406 S/K 249706002100 K/A 000040GEN10 4.1/4.2

2. Response of the CRO to CTMT phase A not being actuated when required.  
CRO-5406 S/K 24970600200 K/A 000040GEN10 4.1/4.2
3. Verification of two trains of safeguards equipment running IAW EEP-0.  
CRO 5406 S/K 241306000450 K/A 000040GEN12 3.8/4.1
4. Response of CRO to faulted S/G indication.  
CRO-5357 S/K 24351502510 K/A 000040EA2.01 4.2/4.7
5. Identification of a faulted S/G.  
CRO-5357 S/K 243515021000 K/A 000040EA2.01 4.2/4.7
6. Monitoring of CSF status trees.  
CRO-5406 S/K 240610021875 K/A000040GEN12 3.8/4.1
7. Recognition that foldout page should be monitored continuously.  
CRO-5406 S/K 240205020340 K/A 000040GEN12 3.8/4.1
8. Verification that S/G levels are sufficiently maintained or AFW flow is maintained.  
CRO-5406 S/K 243575020434 K/A 000040EA2.05 4.1/4.5
9. Recognition of which S/Gs supply steam to the TDAFW pump.  
CRO-5406 S/K 243515022600 K/A 000046EA1.03 4.3/4.3  
061000K1.03 3.5/3.9
10. Precautions associated with isolating the TDAFW steam supply from faulted S/G.  
CRO-5357 S/K 246111020170 K/A 000040EA1.03 4.3/4.3  
061GEN10 3.5/3.6
11. Operation of the CTMT spray system during a steam break.  
CRO-5357 S/K 242662000150 K/A 000040EK3.06 3.4/3.9
12. Determination that SI should be terminated.  
CRO-5406 S/K 240606000343 K/A 000040EA2.05 4.1/4.5

STATIC SIMULATOR EXAM SCENARIO

SCENARIO NO. SS-ERP1.NRC IC NO. 7

EVENT TYPE EMERGENCY

INITIAL CONDITIONS

Time: 5 minutes

An emergency event has occurred. Annunciator G-51 was the first out. Prior to the event the plant was at 100% steady state, equilibrium conditions. 1A MDAFW pump was inoperable and tagged out for maintenance on the motor. Repairs are estimated to be completed in 12 hours.



The operator that was assigned to place the hydrogen analyzers in service reports that neither analyzer will operate correctly. Chemistry reports that they cannot obtain H<sub>2</sub> grab samples due to faulty equipment. Based on these conditions, what would be the correct action to take?

(Circle the correct response.)

- A. Leave H<sub>2</sub> recombiners off until containment H<sub>2</sub> concentration is verified < 4%.
- B. Start the H<sub>2</sub> recombiners and reduce H<sub>2</sub> concentration in the containment by using post-LOCA vent system for two hours.
- C. Reduce H<sub>2</sub> concentration in the containment by using post-LOCA vent system; do not start recombiners.
- D. Start both H<sub>2</sub> recombiners even though H<sub>2</sub> concentration in containment is not known.

ANSWER: EEP1-4.SCN (4 minutes)

A.

What component(s), if any, must be operated by the operator to ensure completion of EEP-0 immediate operator actions?

ANSWER: EEP2-1.SCN (6 minutes)

Shut valve 8152 (to complete  $\phi$ A isolation per EEP-0 attachment 1)(1.0)

What component(s) if any, must be operated by the operator to ensure two trains of S1 flow path are aligned?

ANSWER: EEP2-1.SCN (6 minutes)

Close valves 8108 and/or 8107 (1.0)

(NOTE: Shutting either valve would meet the intent.)

A safety injection has occurred in the plant.

- A. State the type of emergency event which initiated the event.
- B. State the major component which initiated the event.

ANSWER: EEP2-1.SCN (4 minutes)

- A. Steam or feed break (loss of secondary coolant) (.5)
- B. B S/G (.5)

If containment spray were to actuate, it should be stopped when: (Circle the correct response.)

- A. <10% spray add tank level, spray add tank outlet valves closed, and pressure < 26 psig (due to adverse containment)
- B. <16 psig containment pressure regardless of spray add tank level
- C. <10% spray add tank level, spray add tank outlet valves closed, and containment sump recirculated for two hours
- D. <10% spray add tank level, spray add tank outlet valves closed, and <16 psig containment pressure

ANSWER: EEP2-1.SCN (4 minutes)

D

Assuming static plant conditions remain the same, except those indicated in the below choices, which of the following sets of conditions would allow SI termination when the faulted S/G boils dry? (Circle the correct response.)

- A. 52° subcooling, two SGs at 25% NR, one SG at 0% WR, AFW flow at 100 gpm, RCS pressure at 1600 psig and stable, and PZR level at 62%
- B. 52° subcooling, two SGs at 50% NR, one SG at 0% NR, AFW flow at 100 gpm, RCS pressure 1600 psig and stable, and PZR level at 62%
- C. 52° subcooling, 650 gpm AFW flow, RCS pressure 1600 psig and stable, and PZR level 12%
- D. 52° subcooling, 450 gpm AFW flow, RCS pressure 1600 psig and decreasing, and PZR level 62%

ANSWER: EEP2-1.SCN (4 minutes)

B

Assume 30 minutes of operational time have elapsed since the simulator was frozen. The new following plant conditions now exist:

- The SI is still in progress
- RCS  $T_h$  and  $T_c$  are 260°
- RCS pressure is 1600 psig and stable
- PZR level is 95% and increasing
- Containment pressure is 50 psig
- Containment radiation monitors at current value
- Containment sump level is 6.5 feet
- N-31 and N-32 are energized
- Both source range SUR indicate .1 DPM

Based on the above conditions (regardless of the circumstances which led to their formation), answer the following questions:

- A. Which FRPs are required to be implemented?
- B. In what sequence are the FRPs required to be implemented?

ANSWER: EEP2-1.SCN (4 minutes)

- A. FRP-P.1 (.5)  
FRP-Z.1 (.5)
- B. P.1 then Z.1 (.5)

(Minus .25 for any invalid orange or red path)  
(Minus .25 for any yellow path listed as being required)

How should steam flow to the TDAFW pump be isolated? (Circle the correct response.)

- A. It is not required to be isolated based on fault location
- B. Isolation from the MCB
- C. Isolation from the HSD panels
- D. Isolation in the Main Steam valve room

ANSWER: EEP2-1.SCN (4 minutes)

D

(NOTE: Based on NO MDAFW pumps operable and the need to maintain secondary heat sink.)



Based on the present static plant conditions and assuming a 65 gpm primary to secondary leak causes R-15 to alarm and indicate full scale, which of the following best describes the appropriate emergency classification for these conditions? (Circle the correct response.)

- A. Site Area
- B. Alert
- C. NOUE
- D. One hour non-emergency

ANSWER: EEP2.1-SCN (4 minutes)

B.

(Basis EIP-12, 3.2.2 or 3.2.17 or 3.2.8.a)

Based on the present static plant conditions, state the appropriate emergency classification including the procedure and paragraph for your basis.

ANSWER: EEP2.1-SCN (4 minutes)

ALERT, EIP-12 (.5)

Paragraph 3.2.17 or 3.2.8.a (.5)

Based on the emergency event, the first procedure used when the ERP's are entered should be:

- A. ECP-0.0
- B. EEP-0
- C. EEP-1
- D. EEP-2

ANSWER: EEP2-1.SCN (4 minutes)

B.

An MSIV closure signal has been generated, yet one set of MSIVs is indicating not fully closed because: (Circle the correct response.)

- A. They did not receive the MSIV closure signal.
- B. Steam flow is still being directed to the turbine building through the MSIVs.
- C. Reverse steam flow from the steam header to the SG exists.
- D. They are required to remain open to maintain condenser vacuum.

ANSWER: EE2-1.SCN (4 minutes)

C.



RTYPE: K2.04  
(Individual)

RTYPE: K2.07  
(KEY)

TRAINING DEPARTMENT EXAMINATION

NAME(\*RCVR): KEY GROUP: OPS

\*DATE: 01/31/90

EXAM NUMBER: RO-SS-ABN-NRC

EXAM TITLE: NRC - RO - ABNORMAL STATIC TOTAL POINTS: 11.50  
(\*XREF)

INSTRUCTIONS

1. This is a 1.0 hour examination.
2. Point value for each question is indicated in the question header.
3. Answer all questions:
  - On a separate paper.
  - On the answer sheet by circling or marking the correct response or filling in the blanks.
  - On the same page as the question. If extra room is needed, use the reverse side of the previous page or use extra paper.
4. CHEATING OF ANY KIND IS STRICTLY FORBIDDEN. ANY INDIVIDUAL CAUGHT CHEATING WILL AUTOMATICALLY FAIL THE EXAMINATION AND DISCIPLINARY ACTION WILL BE TAKEN.
5. ALL WORK DONE ON THIS EXAMINATION IS MY OWN. TO MY KNOWLEDGE, I HAVE NEITHER GIVEN NOR RECEIVED AID. FURTHERMORE, I WILL NOT DIVULGE THE CONTENTS OF THIS EXAMINATION TO ANYONE ELSE WHO MAY TAKE IT.

EXAMINEE'S SIGNATURE \_\_\_\_\_

EXAM GRADED BY: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_

GRADING/MATH REVIEW BY: \_\_\_\_\_

APPROVED BY: \_\_\_\_\_

*Randy Higgins*  
Training Manager/  
Supervisor

\*INDEXING INFORMATION

2/24/89

# STATIC SIMULATOR EXAM SCENARIO

DATE 900131

PREPARED BY R. C. Lulling

SCENARIO NO SS-ABN1.NRC

IC NO 7

EVENT TYPE ABNORMAL (AOP19-1.SCN)

## TASK NO.            TASK DESCRIPTION

CRO-5033            Perform corrective actions in response to a malfunction of the rod control system.

CRO-5379            Apply action statement of Technical Specifications.

## SCENARIO DESCRIPTION

Initialize at 100% power, BOL, with rods in manual. Initiate a dropped rod malfunction with no reactor trip occurring or required.

## SIMULATOR SETUP

- Initiate MALF CRF-15A, stationary coil, rod F6
- Acknowledge all annunciators that alarm and/or clear
- Allow 15 minutes run time to stabilize Tav<sub>g</sub>, pressure, etc. (900 sec)
- FRZ simulator
- Initiate exam

## GOALS

1. Determine the correct method for restoring RCS Tav<sub>g</sub> to program value.  
CRO-5033 S/K 240122020405 K/A 000003EA1.05 4.1/4.1
2. Determine the reactivity worth of a dropped rod.  
CRO-5033 S/K 240122020430 K/A 000003EK1.03 3.5/3.8
3. Explain the consequences of improperly withdrawing a dropped rod.  
CRO-5033 S/K 240122020440 K/A 000003EK1.01 3.2/3.7
4. Explain the interrelation of the lift coil disconnect switches with the rod control urgent failure alarm.  
CRO-5033 S/K 240109020100 K/A 001050A2.01 3.7/3.9
5. Determine if a negative rate trip exists on a power range drawer.  
CRO-5033 S/K 241540020400 K/A 015000A3.01 3.8/3.8
6. Determine the correct Technical Specification action requirement.  
CRO-5033 S/K 240105020080 K/A 000003 generic 8 3.3/3.9  
S/K 240122020490 K/A 000003EK3.08 3.1/4.2

# STATIC SIMULATOR EXAM SCENARIO

DATE 900131 PREPARED BY R. C. Lulling

SCENARIO NO. SS-ABN2.NRC IC NO. 7

EVENT TYPE ABNORMAL (AOP33-1.SCN)

TASK NO.            TASK DESCRIPTION

CRO-5413            Perform corrective actions in response to a high alarm of the radiation monitoring system.

## SCENARIO DESCRIPTION

Initialize in any plant condition. Initiate an RMS malfunction.

## SIMULATOR SETUP

- Verify multipoint recorders on for 15 min prior to RMS malfunction
- Initiate MALF RMS-2K; 1E6 cpm, no ramp
- Acknowledge all annunciators that alarm
- FRZ simulator
- Initiate exam

## GOALS

1. Verify the validity of a process effluent monitor alarm.  
CRO-5413 S/K 247309020500 K/A 073000A4.02 3.7/3.7
2. Determine the source or cause of high activity utilizing control room indications.  
CRO-5413 S/K 247309020120 K/A 073000A1.01 3.2.3.5
3. Determine if failed process radiation monitor is Technical Specification related.  
CRO-5413 S/K 247304020120 K/A 073000 generic 11 2.8/3.4



STATIC SIMULATOR EXAM SCENARIO

SCENARIO NO. SS-ABN1.NRC/SS-ABN2.NRC IC NO. 7

EVENT TYPE ABNORMAL

INITIAL CONDITIONS

Time: 5 minutes

Unit I was at 100% power steady state, equilibrium conditions when the indicated abnormal event occurred. There were no LCO's or inoperable equipment prior to this event.

The unit is operating at 100% power with main generator load at 867 MWs. The unit operator notices that the DEHC system has automatically transferred to manual. Based on these plant conditions, what are two(2) possible causes of the DEHC system transferring to manual?

ANSWER: (.5 pts. each) (5 minutes)

- A. A loss of 120V AC to the operator auto controllers (also accept: a loss of 120V AC to DEHC)
- B. A failure of both operator auto controllers

A complete loss of instrument air has occurred and the operator tripped the reactor from 100% power. Ten minutes later, the operator attempted to stop the TDAFW pump by shutting the steam admission valves from the MCB. The TDAFW pump would not stop. Which of the following is the cause?

(Circle the correct response.)

- A. Steam admission valves from B & C loops are failed open due to loss of instrument air.
- B. Common steam admission valve in main steam valve room is failed open due to B S/G steam supply valve being in local.
- C. Both main feed pumps tripped.
- D. All S/G levels out of narrow range.

ANSWER: D. (4 minutes)

Unit 1 is in Mode 5 with the RCS at 178°F and 375 psig. A bubble is being drawn in accordance with UOP-1.1, "Startup of Unit from Cold Shutdown to Hot Standby." Excess letdown has been placed in service to expedite drawing the bubble. All initial conditions have been met with one RCDT pump running and the other in pull-to-lock. The recycle evaporator is running and processing the #1 RHT. The CCW system is aligned with the "C" pump running through the "C" heat exchanger. The Unit Operator notices that R-17B readings are starting to increase and that CCW surge tank level has increased 4 inches since the last set of log readings. Based on the above stated plant conditions, determine three(3) potential sources of inleakage to the CCW system.

ANSWER: Any three(3) of the following for .5 each. (5 minutes)

- LTDN heat exchanger
- Excess letdown heat exchanger
- RHR heat exchanger
- RCP thermal barrier
- RCDT heat exchanger
- Charging pump seals
- RHR pump seals

(Minus .25 for sources beyond three that will not result in inleakage or upscale R-17B readings for the stated plant conditions.)

In accordance with AOP-19, "Malfunction of Rod Control System," step 5.4.10 has the operator "zero the pulse to analog converter." If the operator failed to perform this step of the procedure, what, if any, effect(s) will this have following the dropped rod recovery on plant operation.

ANSWER: AOP19-1.SCN (4 minutes)

RIL computer will show rods higher than actual (1.0).  
(or an equivalent statement)

While at 100% power, a dropped rod event occurred on Unit 1. During the recovery, step 5.4.15 of AOP-19 was inadvertently omitted. All other steps were completed according to procedure. When the OATC placed rod control in MANUAL to adjust Tavg to within  $\pm 1^\circ\text{F}$  of Tref, there was no rod motion. Which of the following is the cause of the rods failing to move: (NOTE: No other problems exist in rod control except for omitting step 5.4.15.)(Circle the correct response.)

- A. Logic cabinet urgent failure
- B. Power cabinet urgent failure
- C. Bank D rods are indicating greater than 220 steps preventing outward rod motion
- D. Negative rate rod stop

ANSWER: AOP19-1.SCN (5 minutes)

B.

AOP-19 is in progress and has been performed satisfactorily up to but not including step 5.4.5. Describe the method that you would use to determine the reactivity worth of the dropped rod. (Actual calculation is not required.)

ANSWER: AOP19-1.SCN (4 minutes)  
(Accept other answers on a case-by-case basis which determine the worth of the dropped rod.)

Determine the difference in the power defect for the two power levels (1.0).

OR

Determine the difference in the power defect for the two power levels, taking into account the effect of any boron addition performed.

Following the dropped rod, the operators restored Tavg to program by operation of the turbine controls. Final power level after Tavg was restored to program was 86%. Prior to recovering the dropped rod in accordance with AOP-19, power level should be: (Circle the correct response.)

- A. Maintained at 86%
- B. Increased to 95%
- C. Reduced to 81%
- D. Reduced to 72%

ANSWER: AOP19-1.SCN (5 minutes)

C



The present Quadrant Power Tilt Ratio (QPTR) is:

- A. 1.004
- B. 1.007
- C. 1.011
- D. 1.033

ANSWER: (AOP19-1.SCN)(8 minutes)(1.0)

B.

Upper

$$195/199 = .9799$$

$$188/193 = .9741$$

$$187/191 = .9791$$

$$185/188 = \frac{.9840}{3.9171}$$

$$\text{QPTR} = 1.0048$$

Lower

$$202/222 = .9234$$

$$192/206 = .9320$$

$$200/217 = .9217$$

$$197/213 = \frac{.9249}{3.702}$$

$$\text{QPTR} = 1.0070$$

Which of the following conditions would you expect to observe if this dropped rod event occurred at EOL? (Circle the correct response.)

- A. Smaller increase in Tavg
- B. Smaller decrease in Tavg
- C. Greater increase in Tavg
- D. Greater decrease in Tavg

ANSWER: AOP19-1.SCN (1.0)(4 minutes)

B.

- A. List at least four(4) plant parameters or indications you would use in determining if the RMS alarm is due to an instrument failure. (1.0)

- B. YES or NO: Have all actions occurred that should have for this alarm condition? (Circle the correct answer.)(1.0)

ANSWER: AOP33-1.SCN (2.0) (5 minutes)

- A. Any four(4) of the following for .25 each

CCW surge tank levels unchanged  
"B" train CCW not in service  
Multipoint recorder step change  
Charging flow unchanged  
VCT level unchanged  
RMS meter pegged high  
Both high and low alarm lights lit  
Chemistry sample indicates no activity  
Annunciator F-72 alarming  
Front panel indication not indicating per SOP

- B. YES (1.0)



RTYPE: K2.04  
(Individual)

RTYPE: K2.07  
(KEY)

TRAINING DEPARTMENT EXAMINATION

NAME(\*RCVR):                     KEY                     GROUP: OPS

\*DATE: 01/31/90

EXAM NUMBER: RO-SS-EMER-NRC

EXAM TITLE: NLC - RO - EMERGENCY STATIC TOTAL POINTS: 10.50  
(\*XREF)

INSTRUCTIONS

1. This is a 1.0 hour examination.
2. Point value for each question is indicated in the question header.
3. Answer all questions:
  - On a separate paper.
  - On the answer sheet by circling or marking the correct response or filling in the blanks.
  - On the same page as the question. If extra room is needed, use the reverse side of the previous page or use extra paper.
4. CHEATING OF ANY KIND IS STRICTLY FORBIDDEN. ANY INDIVIDUAL CAUGHT CHEATING WILL AUTOMATICALLY FAIL THE EXAMINATION AND DISCIPLINARY ACTION WILL BE TAKEN.
5. ALL WORK DONE ON THIS EXAMINATION IS MY OWN. TO MY KNOWLEDGE, I HAVE NEITHER GIVEN NOR RECEIVED AID. FURTHERMORE, I WILL NOT DIVULGE THE CONTENTS OF THIS EXAMINATION TO ANYONE ELSE WHO MAY TAKE IT.

EXAMINEE'S SIGNATURE \_\_\_\_\_

EXAM GRADED BY: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_

GRADING/MATH REVIEW BY: \_\_\_\_\_

APPROVED BY: \_\_\_\_\_

*Randy Higgins*  
Training Manager/  
Supervisor

\*INDEXING INFORMATION

2/24/89

# TIC SIMULATOR EXAM SCENARIO

DATE 900131

PREPARED BY R. C. Lulling

SCENARIO NO. SS-ERPL.NRC IC NO. 7

EVENT TYPE EMERGENCY

## TASK NO.            TASK DESCRIPTION

CRO-5406            Perform required actions for Rx trip with SI.  
CRO-5357            Perform required actions in response to a loss  
                         of secondary coolant.

## SCENARIO DESCRIPTION

The plant is initially at 100% steady-state with a MDAFW pump inoperable and red tagged, repairs expected to be complete in 12 hours. A 4E6 stem line break on B S/G inside CTMT causes an automatic Rx trip, SI, and main stem line isolation. CTMT pressure is > 4 psig, causing adverse CTMT conditions. On the SI, phase A isolation valve 8152 (LTDN isolation) and valves 8107 and 8108 (charging isolation valves) fail to close. The simulator is frozen at this time.

## SIMULATOR SETUP

- Init at 100% in IC 7
- Fail valve 8152 open (MALF-CVC5)
- Fail valves 8107 and 8108 open (C-CHGM7=5; CHGM8=5)
- Trip B MDAFW pump (MALF-FWM 1B)
- Tag out a MDAFW pump (C-AFWP1=4)
- Activate steam line break on B S/G inside CTMT (MALF-MSS1B, 4E6, 100 sec ramp)
- Verify Rx trip, SI, and MSLIAS
- Stop stripurge fan
- Place feed reg valve controllers in MAN and shut
- Verify post-LOCA mixing fans and H<sub>2</sub> dilution fans running
- Verify CTMT pressure > 4 psig but < 27 psig (i.e. NO CTMT Spray actuation)
- Verify LCV-1003 closed
- Acknowledge Subcooled Margin Monitors
- FRZ simulator (Prior to CTMT spray actuation!)
- Make the following log entry:  
    "A MDAFW PUMP inoperable due to motor connections;  
    repairs expected to be complete in 12 hours; LCO is  
    written."
- Start exam

## GOALS

1. Verification that a phase A isolation has occurred per attachment 1 of EEP-0.  
CRO-5406 S/K : 06002100 K/A 000040GEN10 4.1/4.2

2. Response of the CRO to CTMT phase A not being actuated when required.  
CRO-5406 S/K 24970600200 K/A 000040GEN10 4.1/4.2
3. Verification of two trains of safeguards equipment running IAW EEP-0.  
CRO 5406 S/K 241306000450 K/A 000040GEN12 3.8/4.1
4. Response of CRO to faulted S/G indication.  
CRO-5357 S/K 24351502510 K/A 000040EA2.01 4.2/4.7
5. Identification of a faulted S/G.  
CRO-5357 S/K 243515021000 K/A 000040EA2.01 4.2/4.7
6. Monitoring of CSF status trees.  
CRO-5406 S/K 240610021875 K/A 000040GEN12 3.8/4.1
7. Recognition that foldout page should be monitored continuously.  
CRO-5406 S/K 240205020340 K/A 000040GEN12 3.8/4.1
8. Verification that S/G levels are sufficiently maintained or AFW flow is maintained.  
CRO-5406 S/K 243575020434 K/A 000040EA2.05 4.1/4.5
9. Recognition of which S/Gs supply steam to the TDAFW pump.  
CRO-5406 S/K 243515022600 K/A 000040EA1.03 4.3/4.3  
061000K1.03 3.5/3.9
10. Precautions associated with isolating the TDAFW steam supply from faulted S/G.  
CRO-5357 S/K 246111020170 K/A 000040EA1.03 4.3/4.3  
061GEN10 3.5/3.6
11. Operation of the CTMT spray system during a steam break.  
CRO-5357 S/K 242662000150 K/A 000040EK3.06 3.4/3.9
12. Determination that SI should be terminated.  
CRO-5406 S/K 240606000343 K/A 000040EA2.05 4.1/4.5

STATIC SIMULATOR EXAM SCENARIO

SCENARIO NO. SS-ERP1.NRC IC NO. 7

EVENT TYPE EMERGENCY

INITIAL CONDITIONS

Time: 5 minutes

An emergency event has occurred. Annunciator G-51 was the first out. Prior to the event the plant was at 100% steady state, equilibrium conditions. 1A MDAFW pump was inoperable and tagged out for maintenance on the motor. Repairs are estimated to be completed in 12 hours.



The operator that was assigned to place the hydrogen analyzers in service reports that neither analyzer will operate correctly. Chemistry reports that they cannot obtain H<sub>2</sub> grab samples due to faulty equipment. Based on these conditions, what would be the correct action to take?

(Circle the correct response.)

- A. Leave H<sub>2</sub> recombiners off until containment H<sub>2</sub> concentration is verified < 4%.
- B. Start the H<sub>2</sub> recombiners and reduce H<sub>2</sub> concentration in the containment by using post-LOCA vent system for two hours.
- C. Reduce H<sub>2</sub> concentration in the containment by using post-LOCA vent system; do not start recombiners.
- D. Start both H<sub>2</sub> recombiners even though H<sub>2</sub> concentration in containment is not known.

ANSWER: EEP1-4.SCN (4 minutes)

A.

What component(s), if any, must be operated by the operator to ensure completion of EEP-0 immediate operator actions?

ANSWER: EEP2-1.SCN (6 minutes)

Shut valve 8152 (to complete  $\phi$ A isolation per EEP-0 attachment 1)(1.0)

What component(s), if any, must be operated by the operator to ensure two trains of SI flow path are aligned?

ANSWER: EEP2-1.SCN (6 minutes)

Close valves 8108 and/or 8107 (1.0)

(NOTE: Shutting either valve would meet the intent.)

A safety injection has occurred in the plant.

- A. State the type of emergency event which initiated the event.
- B. State the major component which initiated the event.

ANSWER: EEP2-1.SCN (4 minutes)

- A. Steam or feed break (loss of secondary coolant) (.5)
- B. B S/G (.5)

If containment spray were to actuate, it should be stopped when: (Circle the correct response.)

- A. <10% spray add tank level, spray add tank outlet valves closed, and pressure < 26 psig (due to adverse containment)
- B. <16 psig containment pressure regardless of spray add tank level
- C. <10% spray add tank level, spray add tank outlet valves closed, and containment sump recirculated for two hours
- D. <10% spray add tank level, spray add tank outlet valves closed, and <16 psig containment pressure

ANSWER: EEP2-1.SCN (4 minutes)

D

Assuming static plant conditions remain the same, except those indicated in the below choices, which of the following sets of conditions would allow SI termination when the faulted S/G boils dry? (Circle the correct response.)

- A. 52° subcooling, two SGs at 25% NR, one SG at 0% WR, AFW flow at 100 gpm, RCS pressure at 1600 psig and stable, and PZR level at 62%
- B. 52° subcooling, two SGs at 50% NR, one SG at 0% NR, AFW flow at 100 gpm, RCS pressure 1600 psig and stable, and PZR level at 62%
- C. 52° subcooling, 450 gpm AFW flow, RCS pressure 1600 psig and stable, and PZF level 12%
- D. 52° subcooling, 450 gpm AFW flow, RCS pressure 1600 psig and decreasing, and PZR level 62%

ANSWER: EEP2-1.SCN (4 minutes)

B

Assume 30 minutes of operational time have elapsed since the simulator was frozen. The new following plant conditions now exist:

- The SI is still in progress
- RCS  $T_h$  and  $T_c$  are  $260^\circ$
- RCS pressure is 1600 psig and stable
- PZR level is 95% and increasing
- Containment pressure is 50 psig
- Containment radiation monitors at current value
- Containment sump level is 6.5 feet
- N-31 and N-32 are energized
- Both source range SUR indicate .1 DPM

Based on the above conditions (regardless of the circumstances which led to their formation), answer the following questions:

- A. Which FRPs are required to be implemented?
- B. In what sequence are the FRPs required to be implemented?

ANSWER: EEP2-1.SCN (4 minutes)

- A. FRP-P.1 (.5)  
FRP-Z.1 (.5)
- B. P.1 then Z.1 (.5)

(Minus .25 for any invalid orange or red path)  
(Minus .25 for any yellow path listed as being required)

How should steam flow to the TDAFW pump be isolated? (Circle the correct response.)

- A. It is not required to be isolated based on fault location
- B. Isolation from the MCB
- C. Isolation from the HSD panels
- D. Isolation in the Main Steam valve room

ANSWER: EEP2-1.SCN (4 minutes)

D

(NOTE: Based on NO MDAFW pumps operable and the need to maintain secondary heat sink.)



Based on the emergency event, the first procedure used when the ERP's are entered should be:

- A. ECP-0.0
- B. EEP-0
- C. EEP-1
- D. EEP-2

ANSWER: EEP2-1.SCN (4 minutes)

B.

An MSIV closure signal has been generated, yet one set of MSIVs is indicating not fully closed because: (Circle the correct response.)

- A. They did not receive the MSIV closure signal.
- B. Steam flow is still being directed to the turbine building through the MSIVs.
- C. Reverse steam flow from the steam header to the SG exists.
- D. They are required to remain open to maintain condenser vacuum.

ANSWER: EE2-1.SCN (4 minutes)

C.



ENCLOSURE 5

SIMULATOR FACILITY FIDELITY REPORT

Facility Licensee: Joseph M. Farley Nuclear Plant

Facility Docket Nos.: 50-348 and 50-364

Operating Tests Administered On: January 30, 1990

During the conduct of the simulator portion of the operating tests, the following items were observed:

Item

Description

None noted.