OPERATOR TRAINING

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NRC REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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Re: **OCONEE NUCLEAR STATION**
Post exam comments

Dear Mr. Haag:

The 2007 Oconee Initial License Examination was administered on 09/07/2007. We have enclosed post exam comments for your review. Please note that the attachment to this document contains confidential information submitted under 10 CFR 2.390.

If you require any additional information, or have further questions, please feel free to contact Gabriel Washburn at (864) 885-4490, or Robert Johnston at (864) 885-4100.

Sincerely,

Neil E. Constance, Jr.

Neil E. Constance Jr.,
Manager of Operator Training

Attachment

Question 11

Unit 1 initial conditions:

- Rule 5 in progress
- ES Channels 1 and 2 initiated

Current conditions:

- RCS pressure = 1820 psig increasing
- Rule 5 is complete
- EHT tab is complete

Based on the above conditions, which ONE of the following states whether ES Channels 1 and 2 may be reset and the lowest level of permission required prior to resetting the channels?

A. yes / Control Room SRO

B. yes / Operations Shift Manager

C. no / Control Room SRO

D. no / Operations Shift Manager

Question 11
T1/G1 - kds

040AA2.05, Steam Line Rupture - Excessive Heat Transfer / 4
Ability to determine and interpret the following as they apply to the Steam Line Rupture: When ESFAS systems may be secured (4.1/4.5)

K/A MATCH ANALYSIS
Question requires knowledge of when ES can be reset and what permission is required.

ANSWER CHOICE ANALYSIS
Answer: B

A. Incorrect: first part is correct. Second part is incorrect. Plausible because directions usually cone from the CRSRO.

B. Correct: the initiating condition is clear and the OSM permission is required to reset ES.

C. Incorrect: first part is incorrect. Plausible because if RCS pressure were above 1600 psig it would be correct. Second part is incorrect. Plausible because directions usually cone from the CRSRO.

D. Incorrect: first part is incorrect. Plausible because if RCS pressure were above 1600 psig it would be correct. Second part is correct.

Technical Reference(s): **EOP Enclosure 5.1, ES Actuation**
Enclosure 5.41, ES Recovery

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-ESA R20**

Question Source: **New**

Question History: Last NRC Exam _____

Question Cognitive Level: **Memory or Fundamental Knowledge**
Comprehension or Analysis

Question 11

COMMENT

Guidance for overriding safety systems is contained in more than one procedure.

At the end of enclosure 5.1, ES Actuation, there is direction to initiate Enclosure 5.41, ES Recovery. This procedure will direct the resetting of ES channels when conditions are met and the OSM concurs in step 1.

- In the conditions contained in the question, the time line is not clear. For certain EHT events, ES 1 and 2 may not immediately actuate, if at all. It cannot be certain under the conditions specified that Enclosure 5.1 had been completed to the point when the initiation of Enclosure 5.41 will occur.

More general guidance is contained in OMP 1-2 (Rules of Practice). Per this procedure equipment automatically actuated by a safety system can be overridden under specified conditions.

If the following are met per step 5.17.B, then ES 1 and 2 can be reset with the approval of two licensed personnel, one of whom is an SRO:

- The system is not required to perform its intended safety function.
    - In the conditions given in the question, RCS pressure is above the setpoint at which ES 1 and 2 are required.
- Its continued operation could increase the severity of the transient, damage equipment, or cause unnecessary operator burden.
    - If ES channels are actuated and the RZ modules are in manual, then the operators would be required to manually initiate any required ES actions. This is an unnecessary burden since, if the ES channels were reset, the system would be in a state that would automatically actuate at setpoint if conditions degrade.

The question did not specify which procedure the candidate should apply to arrive at the correct answer. Thus, depending on the event flowpath and the guidance used, the lowest level of approval may be the SRO per OMP 1-02, making "A" the correct answer, or the OSM per Enclosure 5.41 which would make "B" the correct answer.

Continued next page.

Two students submitted written post-exam feedback on this question asserting that the question did not specify the procedure that should be used to identify the answer. One student provided excerpted information from the documents referenced below.

RECOMMENDATION

Accept answers "A" and "B" as correct.

DOCUMENTATION (attached)

OMP 1-02, Rules of Practice, Pages 28-30 of 42
EOP Enclosure 5.1, ES Actuation, Page 31 of 31
EOP Enclosure 5.41, ES Recovery, Page 1 of 21

5.17 Guidelines for Bypassing of Safety Systems

5.17.1 Safety systems (RPS, AMSAC, DSS, ES, AFIS) must be allowed to perform their automatic function when required for transient mitigation. (14)

5.17.2 Safety systems must **NOT** be bypassed prior to automatic actuation except as follows:

A. Safety systems may be bypassed when directed by operating procedures for normal plant cooldown or when directed by procedures for testing.

B. Safety systems may be bypassed when directed by emergency operating procedures (EOP) and abnormal procedures (AP) for specific transients.

C. Non-procedural blocking of automatic safety systems actuations must be approved prior to taking the action by two licensed personnel, one of whom is an SRO, if both of the following are true:

- The Safety System is **NOT** required to perform its intended safety function (e.g., adequate SCM exists, SG pressures within acceptable limits, etc.).
- Actuation of the Safety System could increase the severity of the transient, damage equipment, or cause unnecessary operator burden.

5.17.3 Equipment automatically actuated by a safety system must **NOT** be repositioned except as follows:

A. Equipment may be overridden and repositioned when directed by emergency procedures (EOP) and abnormal procedures (AP) for specific transients.

B. Equipment may be overridden and repositioned with the approval of two licensed personnel, one of whom is an SRO, if both of the following are true:

- The Safety System is **NOT** required to perform its intended safety function (i.e., adequate SCM exists, SG pressures within acceptable limits, etc.)
- Continued operation of the Safety System could increase the severity of the transient, damage equipment, or cause unnecessary operator burden.

5.17.4 If a safety system has been bypassed or overridden, the operator assumes the responsibility to reactuate the system if necessary for transient mitigation.

5.15 Restoration of Control and Automatic Valves {5}

5.15.1 All control valves and automatic valves being returned to service after maintenance or troubleshooting must be verified to be in the expected position (open, closed, throttled) for current plant conditions prior to opening any isolation valves. Assuming the control or automatic valve to be in the correct position has led to plant events.

Example:

- If 1C-187 was isolated, it must be verified to be closed before opening isolation valve, 1C-186.

5.15.2 Ensure valve controls and corresponding indications agree with valve demand signals and plant conditions by at least two diverse means. Actual valve position should be verified using either local or remote indication.

5.15.3 Control valves should be checked to:

- Verify that power and air, if applicable, are available
- Verify that the control valve is free to operate (e.g., no physical obstructions)

5.16 Keowee Hydro Unit Operations

5.16.1 Startup or operation of the Underground Keowee Unit is prohibited when any IP, PT or maintenance is in progress in conjunction with ES Channel 1 & 2 testing that has the potential to operate any S, SK, or SL breaker. {3}

5.18 Temporary OAC Alarms

5.18.1 Temporary OAC alarms are adjustable alarm setpoints initiated for specific parameters per OP/0/A/1103/020A, *Operator Aid Computer Use*, as an action to increase the monitoring capability of a parameter or system, or as an early warning of changes in a parameter. A temporary alarm setpoint is based on good operating judgment.

5.18.2 The high and low OAC alarm setpoints are fixed and are not considered temporary OAC alarms. These setpoints are administratively controlled by Operations per OP/0/A/1103/020A, *Operator Aid Computer Use*.

5.18.3 Temporary alarms should be reviewed periodically to evaluate the need to continue the temporary alarm.

5.18.4 The following parameters and situations are examples where temporary OAC alarms may be helpful in monitoring the plant to prevent significant plant transients or equipment damage:

- Reactor power
- Condenser vacuum
- Pump/motor vibration
- System flow, pressure, temperature
- Component position
- Control signal to equipment

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
111.__ Verify Unit 2 turbine tripped.	__ **GO TO** Step 114.
112.__ Close 2LPSW-139.	
113.__ Verify total LPSW flow to UNIT 2 LPI coolers ≤ 6000 gpm.	__ Reduce LPSW to UNIT 2 LPI coolers to obtain total LPSW flow ≤ 6000 gpm.
114.__ Close 1LPSW-139.	
115. Place the following in FAIL OPEN: __ 1LPSW-251 FAIL SWITCH __ 1LPSW-252 FAIL SWITCH	
116. Verify either of the following: __ Three LPSW pumps operating __ Two LPSW pumps operating when Tech Specs only requires two to be operable	__ **GO TO** Step 118.
117. Open the following: __ 1LPSW-4 __ 1LPSW-5	
118.__ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). **(PS)**	
119.__ Notify U2 CR SRO that SSF is inoperable due to OTS1-1 open.	
120.__ **IAAT** conditions causing ES actuation have cleared, **THEN** initiate Encl 5.41 (ES Recovery).	
121.__ **WHEN** CR SRO approves, **THEN EXIT** this enclosure.	

• • • END • • •

ENTIRE ENCLOSURE ASH

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE Technical Specification 3.3.7 and 3.3.6 entry is required when any ES component is in Manual while ES signal is present. These conditions are exited when all digital channels are reset.	
1. __ **WHEN** all the following exist: __ ES Channels have actuated __ Condition causing ES Channel actuation has cleared __ ES Channel reset is desired __ OSM concurs **THEN** continue.	
2. Reset desired tripped bistables for the following: __ ES Analog Channel A __ ES Analog Channel B __ ES Analog Channel C	
3. __ Verify reset of ES Channels 1 & 2 is desired.	__ **GO TO** Step 27.
4. Verify the following Stat Alarms have cleared: __ 1SA-7/A-1 (ES HP INJECTION CHANNEL A TRIP) __ 1SA-7/B-1 (ES HP INJECTION CHANNEL B TRIP) __ 1SA-7/C-1 (ES HP INJECTION CHANNEL C TRIP) __ 1SA-7/A-3 (ES RB ISOLATION CHANNEL A TRIP) __ 1SA-7/B-3 (ES RB ISOLATION CHANNEL B TRIP) __ 1SA-7/C-3 (ES RB ISOLATION CHANNEL C TRIP)	1. __ Ensure analog channel bistables are reset. 2. __ **IF** required, **THEN** notify SPOC for assistance. 3. __ **WHEN** the following have cleared, __ 1SA-7/A-1 (ES HP INJECTION CHANNEL A TRIP) __ 1SA-7/B-1 (ES HP INJECTION CHANNEL B TRIP) __ 1SA-7/C-1 (ES HP INJECTION CHANNEL C TRIP) __ 1SA-7/A-3 (ES RB ISOLATION CHANNEL A TRIP) __ 1SA-7/B-3 (ES RB ISOLATION CHANNEL B TRIP) __ 1SA-7/C-3 (ES RB ISOLATION CHANNEL C TRIP) **THEN** continue.

Question 18

Which ONE of following describes the purpose of HPI Forced Cooling and the required number of HPI pumps that will be operating per Rule 4 (Initiation of HPI Forced Cooling)?

A. Maintain RCS pressure less than PZR Safety valves relief set point to prevent them from opening. / 2

B. To remove core decay heat to prevent the core from becoming uncovered. / 2

C. Maintain RCS pressure less than PZR Safety valves relief set point to prevent them from opening. / 3

D. To remove core decay heat to prevent the core from becoming uncovered. / 3

Question 18
T1/G1-kds

BE04EG2.1.27, Inadequate Heat Transfer-Loss of Secondary Heat Sink
Knowledge of system purpose and/or function (2.8/2.9)

K/A MATCH ANALYSIS
Loss of Main and Emergency Feedwater requires HPI forced cooling.

ANSWER CHOICE ANALYSIS
Answer: D

A. Incorrect: HPI F/C is not used to prevent lifting the codes. Plausible because Rule 4 is initiated at 2300 psig.

B. Incorrect: first part correct. Second part incorrect. Plausible because 2 HPI pumps are operating using Rule 1 for Emergency Boration.

C. Incorrect, HPI F/C is not used to prevent lifting the codes. Plausible because Rule 4 is initiated at 2300 psig. Second part is correct.

D. Correct: HPI F/C purpose is to remove decay heat. Three HPI pumps will be operating.

Technical Reference(s): **EOP Rule 4**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP LOHT R??**

Question Source: **New**

Question History: Last NRC Exam _____

Question Cognitive Level: **Memory or Fundamental Knowledge**
Comprehension or Analysis

Question 18

COMMENT

The stem asks the candidate to identify the "required number of HPI pumps that will be operating per EOP Rule 4".

All available HPI pumps will be started in Rule 4, Initiation of HPI Forced Cooling, step 3 if it is assumed that no equipment is out of service. No information is given in the question step to assume otherwise. Thus, in a normal sequence, three HPI pumps will be operating.

Per the Oconee EOP Reference Document, if two HPI pumps can be started then that is considered to be a normal and adequate HPI forced cooling alignment. Two HPI pumps are therefore required from a core cooling perspective.

During the actual exam, one candidate asked if it could be assumed in answering this question that HPI is aligned normally. Other candidates asserted during the post-exam review that only two HPI pumps are required for HPI forced cooling.

RECOMMENDATION

Accept answers "B" and "D" as correct.

DOCUMENTATION (attached)

EOP reference document, Pages 18 and 46
EOP Rule 4, Initiation of HPI Forced Cooling, Page 5 of 9

7.0 Loss of Heat Transfer

Overview

The Loss of Heat Transfer EOP section provides guidance when primary-to-secondary heat transfer has been lost, most likely due to an interruption in feedwater flow. Other causes can be steam generator levels too low or voids in the hot leg U-bends in the absence of forced circulation. The main symptom is increasing RCS temperature. Other abnormal indications include increasing RCS pressure, low steam generator level, and low hot leg levels. Pressurizer level can be either high or low, depending on whether or not the loss of heat transfer is caused by a loss of RCS inventory. Steam generator pressure increasing can be a symptom if the loss of heat transfer is due to a loss of steaming capability. Low steam generator pressure can be a symptom if the steam generator has dried out.

The main mitigation action is to restore a source of feedwater. The order of priority is EFW, MFW, flow from the condensate booster pumps (with MFW pumps tripped), SSF ASW, EFW from another unit, and station ASW. This order is based on how long it takes to restore each source and also the quality of the water supply.

If restoration of a source of feedwater takes more than 6-7 minutes, then the criterion for initiating the backup cooling method, HPI forced cooling (sometimes referred to as feed-and-bleed cooling), will be met. The above time is longer if the loss of MFW and EFW occurs at some time later than the time of reactor trip, or if the event occurs from a reduced initial power level. Aligning HPI forced cooling must be completed in a timely manner or the RCS will heat up to where it will not be successful and the only success path for core cooling will be to restore feedwater. HPI forced cooling mode involves starting all HPI pumps, latching open the pressurizer PORV and PORV block valves, and stopping all but one RCP pump. If only two HPI pumps can be started, then that is still considered to be a normal HPI forced cooling alignment. With this alignment the RCS will go water-solid, the overheating trend will be turned around, and the unit will gradually cool down. Attempts to recover a source of feedwater continue, and when it is restored the HPI forced cooling alignment is exited. If feedwater is not recovered then plant cooldown can continue using the HPI forced cooling alignment. This guidance is in the HPI Cooldown section.

If the normal HPI forced cooling alignment cannot be achieved, then additional actions are necessary to limit the severity of plant conditions until a source of feedwater can be restored, or additional HPI flow can be obtained. If no HPI flow exists then the existing RCS inventory must be conserved by leaving the PORV in automatic (rather than latching it open), and stopping all RCPs to minimize the heat load. If one HPI pump is available, then the high point vents are all opened to try to reduce RCS pressure so that more HPI flow can be delivered, and all RCPs are stopped to minimize the heat load.

If a source of feedwater is restored, then actions may need to be taken to restore primary-to-secondary heat transfer. These actions include lowering steam generator pressure to increase the ΔT driving the heat transfer. Hot leg U-bend voids can also be mitigated by opening the loop high point vents. Reactor coolant pumps can also be restarted to obtain forced circulation. RCPs are only restarted if the subcooled margin exists. Transfers from the LOHT section to other EOP sections are then made to continue with mitigation and recovery actions.

Steps 2 through 4 These steps check the HPI forced cooling alignment criteria following a loss of primary-to-secondary heat transfer. The first criterion is if the core subcooled margin is zero. This can occur if the RCS has overheated and the core exit thermocouples are at saturated conditions, or if RCS pressure control has been lost. The second criterion is if RCS pressure has increased to 2300 psig. The RCS heatup following a loss of heat transfer will compress the pressurizer bubble and pressurize the RCS. This is most

17.0 Rule 4 - Initiation of HPI Forced Cooling

Overview

Rule 4 provides guidance for aligning HPI forced cooling (sometimes referred to as feed-and-bleed cooling) due to a loss of primary-to-secondary heat transfer. The applicable scenarios are a loss of all feedwater, a SBLOCA with a loss of primary-to-secondary heat transfer, and any event that has lost secondary steaming capability due to overfilled steam generators. The desired configuration is to start all three HPI pumps and open the pressurizer PORV and the PORV block valve. Two HPI pumps are also a successful configuration. One reactor coolant pump is left in operation if the RCS is subcooled to provide thermal mixing and to reduce the tube-to-shell ΔT. Additional RCPs are an unnecessary heat load. The pressurizer heaters are also de-energized to eliminate an unnecessary heat load.

If no HPI pumps are operating then the PORV is left in automatic to minimize RCS inventory loss, and all RCPs are stopped to minimize the heat load.

Note: No step specific explanations were identified as necessary in this section

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3. __ Start all available HPI pumps.	
4. Open the following: __ 1HP-26 __ 1HP-27	
5. __ Open 1RC-4.	
6. __ Verify flow exists in any HPI header.	__ **GO TO** Step 8.
7. __ Open PORV.	
8. __ Verify at least two HPI pumps operating.	1. __ **IF NO** HPI pumps are operating, **THEN** perform the following: A. __ Stop all RCPs. B. __ Position 1RC-66 SETPOINT SELECTOR to HIGH. C. __ **GO TO** Step 15. 2. __ **IF** 1HP-26 is closed, **AND** either of the following exists: __ 1A HPI PUMP operating __ 1B HPI PUMP operating **THEN** open 1HP-410. 3. __ **GO TO** Step 10.

Question 45

Plant conditions:

- Unit 1 = 100%
- Unit 2 = de-fueled
- ALL Unit 1 & 2 LPSW pumps have just tripped
- AP-24 (Loss of LPSW) initiated

Based on the current plant conditions, which ONE of the following actions will be taken first per AP/24?

A. Trip the reactor due to CRDM temperatures exceeding operational limits

B. Cross-connect Unit 1 / 2 LPSW with HPSW

C. Trip the reactor due to RCP component temperatures exceeding operational limits

D. Refer to AP/29 (Rapid Unit Shutdown) and commence a Unit 1 shutdown

Question 45
T2 /G1 - kds

076A1.02, Service Water System
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SWS controls including: Reactor and turbine building closed cooling water temperatures (2.6*/2.6*)

K/A MATCH ANALYSIS
The question requires knowledge of the effect of a total loss of LPSW (changes in parameters) will have on CC temperatures (RB CC water) and the effect CC temperature will have on CRDM temperatures including time to exceed operational limits.

ANSWER CHOICE ANALYSIS
Answer: A

A. **Correct: Upon a loss of ALL LPSW pumps, CC temperatures will increase quickly causing a loss of letdown and within several minutes CRDM temperatures exceeding limits. It will take much longer (10-15 minutes) to exceed RCP temperature limits.**

B. Incorrect: AP-24 directs cross connecting with Unit 3 if no LPSW pumps are operating. Plausible because x-connecting with the HPSW system can still be used with the TSC permission.

C. Incorrect: Plausible because unless LPSW is restored, the RCPs will likely have to be secured but the reactor will already have been tripped (these actions are on the same IAAT step).

D. Incorrect: Plausible because with no LPSW letdown will isolate which would require the shutdown of the unit using AP/29 if letdown was not restored.

Technical Reference(s): **AP/24 (Loss of LPSW), AP/20 (Loss of Component Cooling) SSS-HPW Page 17 of 42**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **SSS-LPW R15, 16**

Question Source: **New**

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis

Question 45

COMMENT

The question asks:

> "Based on the current plant conditions, which ONE of the following actions will be taken first ***per AP/24***?"

In accordance with AP-24, Loss of LPSW, step 4.16, answer "C" is correct. This is the only answer which contains an action specifically directed in AP-24.

Two candidates asked similar questions of the proctor. One of these candidate commented that two answers for this question were possible depending on whether you should consider actions contained only in AP24, or also that contained in AP-20 (Loss of Component Cooling). AP-20 is initiated in AP-24 at step 4.15. If AP-20 actions are also considered then "A" could be correct. The first action required, based on heatup of components served by LPSW and Component Cooling, would be to trip the reactor based on CRD temperatures reaching the procedural limit. This is required in AP-20 in step 3.2.

The proctor directed all candidates present to scratch out "Per AP-24" from the stem of the question, making answer "A" the only correct answer (and the only answer that matched the exam key).

There were two candidates however, that had turned in their exam prior to this modification to the question. The required answer for these two candidates should reflect the original, unmodified version, i.e., answer "C".

RECOMMENDATION

Accept answer "A" as the correct answer for the 12 of 14 candidates who were directed by the proctor to alter the question.

Accept answer "C" as the correct answer for the 2 of 14 candidates who answered the original, unmodified version.

DOCUMENTATION (attached)

AP-20, Loss of Component Cooling, Page 1 of 7
AP-24, Loss of LPSW, page 7 of 19

AP-20

1. Entry Conditions

- Loss of CC inventory
- Degraded or loss of CC flow

2. Automatic Systems Actions

2.1 Standby CC pump starts at 575 gpm CC total flow decreasing.

2.2 1HP-5 closes at letdown temperature ≥ 135°F.

2.3 All RCP seal return valves close upon loss of both RCP seal injection (≤ 22 gpm) and total CC flow (≤ 575 gpm) with RCS pressure ≥ 400 psig.

3. Immediate Manual Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.1 __ **IAAT** both of the following are lost: • CC to RCPs • RCP seal injection **THEN** perform the following: A. __ Trip Rx. B. __ Stop all RCPs. C. __ Initiate AP/25 (SSF EOP).	
NOTE If CRD stator cooling is lost, stator temperatures will reach 180°F in ≈ 4 minutes.	
3.2 __ **IAAT** ≥ two CRD stator temperatures ≥ 180°F, **THEN** trip Rx.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.11 __ Dispatch an operator to perform Encl 5.1 (Local Operator Actions).	
4.12 __ **IAAT** conditions permit for a secured pump to be re-started, **THEN** start the LPSW pump(s) that were previously secured.	
4.13 __ **IAAT NO** Unit 1 & 2 LPSW pumps are available, **AND** Unit 3 LPSW system is available, **THEN** perform the following: A. __ Direct Unit 3 to start an additional LPSW pump, as required. B. __ Notify the operator performing Encl 5.1 (Local Operator Actions) to cross-tie Unit 1&2 LPSW to Unit 3.	
4.14 __ Verify CC related alarms.	__ **GO TO** Step 4.16.
4.15 __ Initiate AP/20 (Loss of Component Cooling).	
4.16 __ **IAAT** <u>any</u> RCP temperature limit is exceeded: {1}	

✓	Temperature	Limit
	Motor thrust bearing	190°F
	Motor upper guide bearing	190°F
	Motor lower guide bearing	190°F
	RCP motor stator	295°F
	RCP seal return	260°F
	RCP radial bearing	225°F

THEN perform the following:

A. __ Trip Rx.

B. __ Stop <u>all</u> RCPs.

Question 75

Unit 1 initial conditions:

- Time = 1000
- Reactor power = 100%
- 1B MD EFDWP out of service

Current conditions:

- Time = 1015
- MSLB outside containment
- 1A SG pressure = 0 psig stable
- 1B SG pressure = 1000 psig stable
- RCS pressure = 1520 psig increasing

Based on current plant conditions, which ONE of the following correctly states which procedure each member of the crew should perform at 1016?

ASSUME NO OPERATOR ACTIONS

A. SRO in Excessive Heat transfer tab / OATC performing Encl 5.1 (ES actuation) / BOP performing Rule 5 (Excessive Heat Transfer)

B. SRO in Loss Of Heat Transfer tab / OATC performing Rule 5 (Excessive Heat Transfer) / BOP performing Rule 3 (Loss of Main or Emergency Feedwater)

C. SRO in Excessive Heat transfer tab / OATC performing Rule 5 (Excessive Heat Transfer) / BOP performing Rule 3 (Loss of Main or Emergency Feedwater)

D. SRO in Loss Of Heat Transfer tab / OATC performing Encl 5.1 (ES actuation) / BOP performing Rule 3 (Loss of Main or Emergency Feedwater)

Question 75
T3 - kds

G2.4.13
Knowledge of crew roles and responsibilities during EOP flowchart use. (3.3/3.9)

K/A MATCH ANALYSIS
Question requires knowledge of crew roles for a specific set of conditions.

ANSWER CHOICE ANALYSIS
Answer: B

A. Incorrect: SRO should be in Loss of Heat Transfer Tab. Plausible because an Excessive Heat Transfer event has occurred.

B. Correct: For the stated conditions, a loss of heat transfer and an excessive heat transfer condition exists. Based on procedure Hierarchy, the LOHT tab should be entered and Rule 3 and Rule 5 should also be entered. Encl 5.1 will eventually be performed after Rule 3 or Rule 5 is complete.

C. Incorrect: SRO should be in Loss of Heat Transfer Tab. Plausible because an Excessive Heat Transfer event has occurred.

D. Incorrect: BOP should be performing Rule 5 (higher priority). Plausible because Encl 5.1 will eventually be performed after Rule 3 or Rule 5 is complete.

Technical Reference(s):

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-EOP R26**

Question Source: **New**

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis

Question 75

COMMENT

During the exam one candidate asked if the Turbine-Driven EFW Pump (TDEFDWP) could be assumed to have been started. Another candidate commented that training had been given to the class, based on clarification given by an Operations Liaison as an expectation, that required one to look at the answer in "several different ways".

The proctor was not aware of the clarification given by Operations. He told the class to answer the question based on normal procedure hierarchy for tabs and rules. Three candidates, however, had already turned in their exam and one additional candidate was in the restroom. These four individuals did not benefit from the proctor's clarification.

The clarification from Operations, which was transmitted to Operations Training by e-mail, is that in the case of a steam line break with the Motor Driven EFW Pump (MDEFDWP) out of service to the intact steam generator and the TDEFDWP available, the Loss of Heat Transfer Tab (LOHT) or Rule 3, Loss of Main or EFW, should <u>not</u> be entered until a manual start of the Turbine-driven EFW Pump (TDEFDWP) is attempted. The Loss of Heat Transfer Symptom is indicated by a Loss of Main and Emergency FDW (including unsuccessful manual initiation of EFDW). The TDEFDWP will not start automatically due to the AFIS interlock but is available for a manual start. Rule 5, Main Steam Line Break, step #2 directs a manual start of the TDEFDW Pump due to the MDEFDW Pump on the unaffected SG not running. The Excessive Heat Transfer Tab (EHT) would be entered.

The sequences are as follows,

<u>If Guidance from Operations is applied then "A" is correct</u>:

-Main Steam Line Break occurs (MDEFDWP to intact steam generator OOS)
-Reactor Trip
-OATC performs IMAs
-BOP performs Symptom Check
-BOP notes no Main or EFW pumps running
-BOP verifies AFIS actuation to ensure that he is not bypassing a safety system (He would normally attempt to start the MDEFDWP on the intact steam generator but recognizes it is OOS)
-BOP recognizes (from training) that the correct actions to start the TDEFDWP are contained in Rule 5.

- Rule 5 entry conditions are met in this case due to the main steam line break.
- This path will isolate the EFW valves to the faulted steam generator.
- If Rule 3 actions are taken without this isolation and the TDEFWP is started, this would result in feeding the faulted generator.
- When the TDEFDWP is started in rule 5, Rule 3 no longer applies.

Continued next page.

-BOP enters Rule 5, isolates the faulted generator and starts the TDEFDWP.
-CRS enters EHT Tab
-OATC directed to perform Enclosure 5.1
-Rule 5 will ultimately direct that Rule 3 be performed to verify proper TDEFDW operation

If the EOP hierarchy of Rules is applied then "B" is correct:

-Main Steam Line Break occurs (MDEFDWP to intact steam generator OOS)
-Reactor Trip
-OATC performs IMAs
-BOP performs Symptom Check
-BOP notes no Main or EFW pumps running
-BOP initiates Rule 3 (will start the TDEFDWP after entering)
-CRS enters LOHT Tab
-OATC initiates Rule 5

In the second sequence the crew would implement the LOHT Tab until the TDEFDWP is started. After this is done the crew would discontinue the LOHT and, shortly thereafter, transfer to the EHT tab.

RECOMMENDATION

Accept answer "A" for the four candidates that did not receive proctor's clarification.

Accept Answer "B" for the ten candidates that received proctor's clarification.

DOCUMENTATION

Copy of E-mail attached