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SRO QUESTION # 9; EXAMINATION QUESTION #084

Both Units are in normal full power operations when a fire develops in the control boards. The fire causes the following conditions:

- Spurious cycling of plant equipment
- The crew will be forced to evacuate the Control Room

**As a Control Room Supervisor, which of the following describes your response?**

- a. Trip the reactor and enter EOP-0, 'Reactor Trip or Safety Injection'. Perform AOP-10A, 'Safe Shutdown - Local Control' in parallel until the Control Room is accessible.
- b. Enter AOP-10A, 'Safe Shutdown - Local Control'; Entering EOP-0, 'Reactor Trip or Safety Injection' is **not** required.
- c. Trip the reactor and perform the immediate actions of EOP-0, 'Reactor Trip or Safety Injection', then transition to AOP-10A, 'Safe Shutdown - Local Control'.
- d. Enter AOP-10A, 'Safe Shutdown – Local Control'; Entering EOP-0, 'Reactor Trip or Safety Injection' is required after the Control Room is accessible.

ANSWER

b.

**Facility Contention:**

This question provides initial conditions of a fire in the control boards resulting in the spurious cycling of plant equipment and subsequent evacuation of the Control Room. The question then asks for the response of the Control Room Supervisor for these conditions.

The correct answer provided on the exam was Choice B – “Enter AOP-10A, 'Safe Shutdown – Local Control': Entering EOP-0, Reactor Trip or Safety Injection' is not required.”

Choice B is correct. AOP-10A entry conditions are met; and specific guidance is provided via a NOTE prior to step 1 of AOP-10A which states “Entry into EOP-0, Reactor Trip or Safety Injection, is not required.” The timeframe in reference to Choice B is assumed to be immediately upon identification of the conditions provided in the stem of the question. No other conditions that would modify the stem are provided in Choice B.

Choice D is also correct. Choice D states, “Enter AOP-10A, 'Safe Shutdown – Local Control'; Entering EOP-0, Reactor Trip or Safety Injection' is required after the Control Room is accessible.”

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Choice D imposes an additional condition on the use of EOP-0 that Choice B or the stem of the question does not contain. Specifically, this is the condition of “after the Control Room is accessible.” This clearly separates Choice B and D from essentially being opposite with respect to EOP-0 entry.

From the information provided in the stem of the question, it is not clear whether the Control Room was evacuated due to the spurious cycling of plant equipment (a symptom for entry to AOP-10A which does not require entry) or due to habitability concerns (a required entry condition for AOP-10A), or a combination of both. Specific equipment impacted is not provided, so the extent of the equipment issue is unknown. This could significantly impact a decision on recovery should the Control Room become accessible.

If the Control Room were evacuated due to habitability issues and subsequently became accessible, personnel would then return to establish control of plant systems. As previously mentioned, it is unclear in the stem of the question whether the Control Room was evacuated due to a loss of control of vital equipment or due to the fire/smoke resulting in habitability issues. Although the stem indicates that “spurious cycling of plant equipment” occurred, the question is not specific about what equipment was affected. From the information provided, it is reasonable to assume that the Control Room was evacuated due to habitability issues resulting from the fire. Should Control Room accessibility be restored, then control would be re-established from the Control Room if at all possible.

If control from the Control Room can be established, AOP-10A would no longer be in effect (exit at step 51) and the Note prior to step 1 pertaining to EOP-0 is no longer applicable. Upon returning to the Control Room, a valid Reactor Trip signal would be present, requiring entry into EOP-0. Although the steps of EOP-0 would have to be evaluated carefully due to alignments made in AOP-10A, not entering EOP-0 would be a deviation from established guidance and would require proper authorization. Similarly, if personnel returned to the Control Room and a Safety Injection signal is present, an entry condition for EOP-0 would also be present and require performance of EOP-0. Not performing EOP-0 for either situation would require proper authorization and approval. Therefore, Choice D is also correct.

Choices A and C are clearly incorrect. Both of these Choices indicate that immediate entry to EOP-0 is required, which would be incorrect due to Control Room conditions and guidance provided in AOP-10 A.

The ambiguity introduced in Choice D by saying “is required after the Control Room is accessible” contributed to four of the eight examinees selecting this as the correct answer.

In summary, Choices B and D are both correct Choices A & C are incorrect for SRO Question #9 (84).

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**NRC Final Resolution:**

The NRC agrees with the facility that distractors (a.) and (c.) are incorrect. The NRC agrees that distractor (b.) is a correct answer. However, the NRC does not agree that distractor (d.) is a correct answer. The distractor states: ***“Enter AOP-10A, ‘Safe Shutdown – Local Control’; Entering EOP-0, ‘Reactor Trip or Safety Injection’ is required after the Control Room is accessible.*** The first portion of the distractor is correct. Entry into AOP-10A is required per the conditions provided in the stem of the question. However, the NRC does not agree that the second part of the distractor is correct. The facility contends that when the control room is re-entered, AOP-10A is no longer in effect and, since a valid scram signal is in effect, EOP-0 is **required** (emphasis added) to be entered. This is in direct opposition to the development statement from the facility for distractor (d.) which stated: “Incorrect because EOP-0 entry is **not required** (emphasis added) for this Appendix R fire condition. Plausible in that the AOP has higher priority and student may think the EOP is done sequentially.”

In reality a control room entry team would determine what procedures would be in effect when control room re-entry occurs. The entry team may choose to enter EOP-0, or it may choose to not enter EOP-0 because the appropriate steps of EOP-0 were completed while the operators were executing the steps of AOP-10A. In order for distractor (d.) to be correct, the applicant must make an assumption that the entry team has required the use of EOP-0 when re-entry occurs. The requirement to enter EOP-0 is not supported by the station’s procedures. The facility also contended that it is not clear whether the control room was evacuated due to the spurious cycling of plant equipment or due to habitability concerns, or a combination of both. The stem clearly states there is spurious cycling of equipment and the control room must be evacuated. To say the control room had to be evacuated because of habitability issues would require an assumption on the part of the applicant that goes beyond the stem of the question. When the examination rules were read to the applicants, it was stressed that the applicants are not to make assumptions that are not a normal consequence of the stem of the question. In both of these instances noted above, an applicant would have to make an assumption that is not a natural part of the conditions of the question.

In summary, the NRC agrees with the original question development statement in that EOP-0 entry is not required when control room accessibility is re-established, but may be entered. The examination answer key was not altered for this question. The only correct answer to Question #9 (84) is distractor (b.).

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SRO Question #14; Examination Question # 89:

Unit 1 is responding to a Steam Generator Tube Rupture on the 'A' Steam Generator.

- The crew is currently implementing EOP-3.1 'Post Steam Generator Tube Rupture Cooldown Using Backfill' in order to cooldown and depressurize the RCS
- Equipment malfunctions have caused the level in the 'A' Steam Generator to begin rising
- 1C03 1E2 1-2, 'Steam Generator 'A' Level Setpoint Deviation' is LIT and level is currently 95% and slowly rising
- The Shift Technical Adviser has informed the Operating Supervisor that a Yellow Path condition exists on the Heat Sink Critical Safety Function and that entry conditions for CSP-H.3 'Response to Steam Generator High Level' are met

**If not corrected, (1) which of the following describes the most imminent damaging effects of this situation and (2) how the SRO will prioritize the use of CSP-H.3?**

- a. (1) Damage to 1P-29 Turbine Driven Auxiliary Feedwater Pump is likely.  
(2) The SRO must enter CSP-H.3 to address the challenge to the Heat Sink safety function because CSP-H.3 is a higher priority procedure than EOP-3.1.
- b. (1) Potential damage to the Main Turbine is likely.  
(2) The SRO may enter CSP-H.3 at his discretion. If entered, the requirements of CSP-H.3 will supersede any continuous actions that were in effect in EOP-3.1.
- c. (1) Potential damage to the 'A' Steam Generator Atmospheric Dump Valve is likely.  
(2) The SRO may enter CSP-H.3 at his discretion. If entered, any continuous actions that were in effect in EOP-3.1 will have priority over actions directed in CSP-H.3.
- d. (1) Potential damage to 'A' Steam Generator Safety Valves is likely.  
(2) CSP-H.3 may NOT be used in this situation because the crew is now in the event-specific recovery procedure.

ANSWER

c.

**Facility Contention:**

This question establishes that a crew is implementing EOP 3.1 'Post Steam Generator tube Rupture Cooldown using Backfill' when they note that 'A' Steam Generator level is 95% and slowly rising.

The question has two parts:

- For which of the given pieces of equipment is damage most imminent, and
- how will the SRO prioritize the use of CSP-H.3.

Choices 'A' and 'B' are clearly incorrect. The first part of both of these is incorrect because both pieces of equipment have been isolated by previous actions for this event. The second part of both of these choices each has a flaw in stating the relative priority of CSP-H.3 yellow path procedure and EOP-3.1.

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The key answer 'C' is correct. If the level continues to rise, the steam generator will overflow, the steam line will fill with water, and the Atmospheric Dump Valve could have water relief if pressure were to rise to the setpoint. While damage to the valve in this event is not a certain outcome, potential damage is likely. The second part of 'C' correctly notes that CSP-H.3 is entered at SRO discretion and that any continuous actions that were in effect in EOP3.1 will have priority over actions directed in this yellow path procedure.

There are two unintended semantic psychometric errors that combine to make choice 'D' also correct.

The first unintended psychometric error occurred when the question author used the term "most imminent," intending to denote that which will happen first. However, this is not common terminology, and can have alternative meanings.

The definition per Webster's Ninth New Collegiate Dictionary is:  
"Ready to take place: esp." hanging threateningly over one's head (was in imminent danger of being run over)"

This shows how the word can be used to convey two meanings. If a pedestrian had a child on a tri-cycle coming at them about 2 feet away and a runaway car approaching 20 feet away, the "most imminent damaging effect" could be from either.

At some point in question development, the link between this unclearly stated condition of the stem and what the answer choices contain was broken. Each of the choices simply states that potential damage to a component is likely. There isn't a sense of timing or importance (i.e., we don't ask which will occur first or which one looms larger in importance).

Choice 'D' first part states that potential damage to the 'A' Steam Generator Safety Valves is likely. 'D' is correct because, although the ADV can minimize challenges to the code safeties, damage is still possible if the line is water solid and pressurized to the point where the safety valve lifts. The code safety can not be isolated protection from this condition. Water relief that results in damage to the code safety would be more serious because that can not be isolated.

The second part of choice 'D' contains the second unintended psychometric error. While the question author intended for this distractor to state that the yellow path procedure is not applicable (or can not be used) in this situation, he incorrectly said that it may not be used. The candidate who missed this question thought this use of the word implied choice (i.e., may or may not be used). He then correctly reasoned that, with the crew implementing the event-specific recovery procedure, the SRO may not be using CSP-H.3 because the event-specific procedure will provide adequate guidance for the rising SG level.

Recommend that credit be given for both 'C' and 'D'.

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**NRC Final Resolution:**

The NRC agrees with the facility's contentions in part. The NRC agrees that distractors (a.) and (b.) are incorrect. The NRC does not agree that distractor (d.) is a correct answer. The definition of imminent provided by the facility "Ready to take place: esp." hanging threateningly over one's head (was in imminent danger of being run over)." was modified by the adjective in front of imminent (most) and makes the question determine which of the distractors is "most ready to take place, that is, which will happen first. The facility's example of a tricycle 2 feet away and a car 20 feet away, both headed for an individual also demonstrates this point. If the tricycle was nearly stopped and the car was going 30 miles per hour, the car would be the most imminent event because it would happen first. However, if the car is nearly stopped and the tricycle is going at a high rate of speed, then the tricycle hitting the individual would be the most imminent. Additionally, as noted by the facility, distractor (d.) used the words "may not be used" in the second part of the distractor. The facility contends an applicant interpreted this to grant permission to not use the applicable procedure and made an incorrect choice because of this perceived permission. During the reading of the examination administration rules, the applicants were told that they should ask clarifying questions of the proctors if a question was not complete or had unclear portions. The applicant did not ask the proctors for a clarification of this item. Mis-interpreting the word "imminent" and not clarifying the second part of the distractor does not justify a change to the answer key to make distractor (d.) a correct answer. The NRC did not modify the answer key to accept distractor (d.) as a correct answer.

After reviewing the facility's contention concerning the use of the word "imminent" in this question, the NRC has determined the designated correct answer (c.) is not a correct answer. The NRC applied the definition of imminent to the first part of the proposed correct answer which stated: "Potential damage to 'A' Steam Generator Safety Valves is likely," and determined that the words "potential" and "is likely" are disqualifiers for the term "imminent." If damage is imminent, it is ready to take place, not likely to take place, or there is a potential for it to take place. When other considerations not provided in the stem of the question such as, flow rates, pressures, temperatures, etc., are variables, the potential damage implied in the distractor may not even occur. Because the damage is likely or potential, or may not even occur, the damage is not "imminent" and distractor (c.), the designated correct answer, is not a correct answer to the question. Additionally, for this same reason, all the distractors in this question are incorrect. Therefore, there was no correct answer supplied for this question.

Because there was no correct answer to this question, the NRC has deleted the question from the examination.