

Mr. Todd Fish
USNRC
475 Allendale Road
King of Prussia, PA 19406

June 17, 2004

Dear Mr. Fish,

Enclosed please find the following documents submitted IAW NUREG-1021, Draft Revision 9, Section ES-501, Initial Post Exam Activities, for the Salem Initial License Written Examination conducted on June 14, 2004:

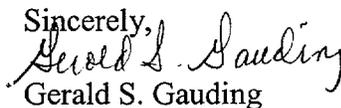
1. The graded written examinations consisting of each applicants original answer and examination cover sheets plus a clean copy of each applicants answer sheet.
2. An original RO question 68 annotated to show a pen and ink change made during the exam, and a new clean copy of that question after it had been changed in the Master computer copy. You have the complete Master Examination other than this one change. Also included in this package is the updated answer key for both exams.
3. An updated RO question 74 which states in the comments section that b and d were both accepted as correct answers, along with the separate document with justification for the change.
4. The questions asked by and answers given to the applicants during the written examination.
5. The written examination seating chart.
6. Completed Form ES-403-1 Written Examination Grading Quality Checklist.
7. NC.TQ-DG.ZZ-0001 Training Manual, Attachment 18 Exam Item Review Form, consisting of analysis of questions that more than 30% of applicants answered incorrectly. There is one form for the RO section and a separate form for the SRO section.

See
Attached

See
Attached

The original forms ES-201-3 Examination Security Agreement are NOT included with this package as we are in the process of obtaining post-examination signatures from all the individuals who had signed the agreement.

Please contact me at 1-856-339-1554 if you have any questions.

Sincerely,

Gerald S. Gauding

Question Topic

Given the following:

- Salem Units 1 and 2 are operating at 100% power.
- 1A EDG is C/T for maintenance.
- A loss of off-site power occurs, and both units trip.
- 1B EDG fails to start.
- 1C EDG starts and trips on low lube oil pressure.

Which of the following choices describes how the control room response will differ if the crew directly enters 1-EOP-LOPA-1 LOSS OF ALL AC POWER, instead of 1-EOP-TRIP-1 REACTOR TRIP OR SAFETY INJECTION?

- a. In LOPA-1, a manual Safety Injection will NOT be initiated by the operators prior to power restoration. TRIP-1 requires a Safety Injection to be performed prior to transition out of TRIP-1.
- b. In LOPA-1, Functional Restoration Procedures (FRPs) will NOT be implemented until after a transition out of LOPA-1 is performed. In TRIP-1, FRPs may be implemented prior to transition out of TRIP-1.
- c. LOPA-1 verifies AFW flow to be > 22E4 lbm/hr. TRIP-1 verifies flow to be >44E4 lbm/hr.
- d. LOPA-1 does NOT confirm the reactor trip; TRIP-1 does confirm the reactor trip.

Answer: Exam Level: Cognitive Level: Facility: ExamDate:

KA: RO Value: SRO Value: Section: RO Group: SRO Group:

System/Evolution Title

GENERI

KA Statement:

Knowledge symptom based EOP mitigation strategies.

Explanation of Answers:

d is correct because FRPs are designed with the assumption that at least 1 4kv vital bus is energized so that the operator can perform actions to trip the reactor or borate the RCS. Distractor c is incorrect because LOPA-1 verifies 44E4 lbm/hr to verify that the TDAFW pump is supplying the minimum safeguards AFW flow for heat removal. Distractor b is incorrect because FRP's are implemented PRIOR to leaving LOPA-1 at step 20 when prompt restoration of a vital bus has occurred.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of All AC Power Basis Document	1-EOP-LOPA-1			
Reactor Trip Response	1-EOP-TRIP-1			

L.O. Number

Objectives

LOPA00E007

Material Required for Examination

Question Source: Question Modification Method: Used During Training Program

Question Source Comments

Comment

Accepted b and d as correct answers. Justification on separate sheet.

Salem NRC Written Exam 6/14/04 Proposed Changes to Exam

Question RO #74

Comment: The question asks for the difference in crew response for a Loss of All AC Power (LOPA) if the crew enters LOPA-1 LOSS OF ALL AC POWER directly instead of entering EOP-TRIP-1 REACTOR TRIP RESPONSE first then transitioning to LOPA-1 at Step 4.

- The LOPA-1 Basis Document states... "In addition to the explicit entry condition from EOP-TRIP-1, this EOP is also entered per the rules of usage anytime from anywhere on the symptom of a loss of all AC power (all 4KV group and vital busses de-energized)." Page 1
Additionally... "EOP-LOPA-1 may be entered directly (without implementing EOP-TRIP-1) as a result of the operator observing the symptoms of a loss of all 4KV vital buses." Page 7
- LOPA-1 does NOT confirm the reactor trip. There is no power available. Step 3 of EOP-LOPA-1 directs the operator to trip the reactor, since LOPA-1 may have been entered directly. However, there is no step to confirm the reactor trip in LOPA-1.

"A transition is not provided to procedure EOP-FRSM if the reactor trip is not confirmed since FRSM-1 assumes a 4KV vital bus is available and that the operator can perform actions to trip the reactor or borate the RCS." LOPA Basis Document Page 7

- The correct answer to Question 74 was choice d. This answer is correct because confirmation of reactor trip is NOT performed in LOPA-1, while it is always performed in TRIP-1. LOPA does not include a step for reactor trip confirmation because ... "The EOP performs the RNO action directly, so listing these indications is unnecessary." (LOPA Basis Document Page 8 ERG Deviations.)

The facility recommends acceptance of an additional answer, Distracter b, "In LOPA-1, Functional Restoration Procedures (FRPs) will NOT be implemented until after a transition out of LOPA-1 is performed. In TRIP-1, FRPs may be implemented prior to transition out of TRIP-1." To be correct, both parts of this choice must be correct.

- The first part of choice b is correct because of the following:

A basic tenet of Functional Recovery Procedures (FRPs) is that at least ONE 4KV vital bus is energized. The Basis Document for LOPA-1 states the ERG Basis for NOT implementing FRPs in LOPA.... "This procedure has priority over all FRPs and is written to implicitly monitor and maintain critical safety functions. This priority is necessary since all FRPs are written on the premise that at least one 4KV vital bus is energized." (2-EOP-LOPA-1 Basis Document, Rev. 24 page 6.)

If operators are successful in restoring power quickly to any 4KV vital bus, the procedure checks SI requirements (Step 17), Charging pump suction alignment (Step 18), Turbine Building SW alignment (Step 19), then re-asks if a 4KV vital bus is energized (Step 20). When this decision step is reached and answered YES, the operator is directed to implement FRPs and return to procedure in effect. The physical placement of the parts of Step 20 are NOT intended to have FRPs implemented while still in LOPA-1, (during the construction and technical review of this question, it was not identified that a different procedure flow path and transition point could be reached, and that the physical order of step 20 did NOT mean that the FRP's would be implemented in LOPA-1) rather it is a reminder that since a 4KV vital bus is now energized, that upon exiting LOPA-1 the Critical Function Status Trees may be used to direct entry into FRPs. **At no point would the FRPs be implemented and used IN PARALLEL with the LOPA-1 procedure.**

If operators are unable to restore a 4KV vital bus by step 20, then the procedure would continue until a 4KV vital bus is recovered and the appropriate transition to LOPA-2 LOSS OF ALL AC POWER RECOVERY/SI NOT REQUIRED, or LOPA-3 LOSS OF ALL AC POWER RECOVERY/SI REQUIRED. FRPs would not be implemented in LOPA-1. The first two steps of LOPA-2 and LOPA-3 are identical to LOPA-1 in that FRP's are not to be implemented until directed.

In ALL cases, FRPs will NOT be implemented in LOPA-1.

- The second part of the choice b is correct because of the following:

Even though both plants were said to be tripped in the question stem, it is fair to determine that the plant is not tripped until confirmed in EOP-TRIP-1 Step 2. Therefore, there are two possible procedure paths, the transition to LOPA-1 after the trip has been confirmed, or the implementation of FRSM-1 based on the reactor trip NOT being confirmed at Step 2. In this case, implementation of FRSM-1 would occur if the reactor trip was not confirmed, and as such would make the second part of choice b correct.

ATTACHMENT 1

FACILITY COMMENT ON WRITTEN EXAM AND NRC RESOLUTION

Question RO #74:

The question asks for the difference in crew response for a Loss of All AC Power (LOPA) if the crew enters LOPA-1 LOSS OF ALL AC POWER directly instead of entering EOP-TRIP-1 REACTOR TRIP RESPONSE first then transitioning to LOPA-1 at Step 4.

- The LOPA-1 Basis Document states ... “In addition to the explicit entry condition from EOP-TRIP-1, this EOP is also entered per the rules of usage anytime from anywhere on the symptom of a loss of all AC power (all 4KV group and vital busses de-energized)”.

Additionally ... “EOP-LOPA-1 may be entered directly (without implementing EOP-TRIP-1) as a result of the operator observing the symptoms of a loss of all 4KV vital buses.”

- LOPA-1 does NOT confirm the reactor trip. There is no power available. Step 3 of EOP-LOPA-1 directs the operator to trip the reactor, since LOPA-1 may have been entered directly. However, there is no step to confirm the reactor trip in LOPA-1.

“A transition is not provided to procedure EOP-FRSM if the reactor trip is not confirmed since FRSM-1 assumes a 4KV vital bus is available and that the operator can perform actions to trip the reactor or borate the RCS.” (Also from the LOPA Basis Document.)

- The correct answer to Question 74 was choice d. This answer is correct because confirmation of reactor trip is NOT performed in LOPA-1, while it is always performed in TRIP-1. LOPA does not include a step for reactor trip confirmation because ... “The EOP performs the RNO action directly, so listing these indications is unnecessary.” (LOPA Basis Document.)

The facility recommends acceptance of an additional answer, Distracter b, “In LOPA-1, Functional Restoration Procedures (FRPs) will NOT be implemented until after a transition out of LOPA-1 is performed. In TRIP-1, FRPs may be implemented prior to transition out of TRIP-1.” To be correct, both parts of this choice must be correct.

- The first part of choice b is correct because of the following:

A basic tenet of Functional Recovery Procedures (FRPs) is that at least ONE 4KV vital bus is energized. The Basis Document for LOPA-1 states the Basis for NOT implementing FRPs in LOPA as follows ... “This procedure has priority over all FRPs and is written to implicitly monitor and maintain critical safety functions. This priority is necessary since all FRPs are written on the premise that at least one 4KV vital bus is energized.” (2-EOP-LOPA-1 Basis Document, Rev. 24 page 6.)

If operators are successful in restoring power quickly to any 4KV vital bus, the procedure checks SI requirements (Step 17), Charging pump suction alignment (Step 18), Turbine Building SW alignment (Step 19), then re-asks if a 4KV vital bus is energized (Step 20). When this decision step is reached and answered YES, the operator is directed to implement FRPs and return to procedure in effect. The physical placement of the parts of Step 20 are NOT intended to have FRPs implemented while still in LOPA-1, (during the construction and technical review of this question, it was not identified that a different procedure flow path and transition point could be reached, and that the physical order of step 20 did NOT mean that the FRPs would be implemented in LOPA-1) rather it is a reminder that since a 4KV vital bus is now energized, that upon exiting LOPA-1 the Critical Function Status Trees may be used to direct entry into FRPs. **At no point would the FRPs be implemented and used IN PARALLEL with the LOPA-1 procedure.**

If operators are unable to restore a 4KV vital bus by step 20, then the procedure would continue until a 4KV vital bus is recovered and the appropriate transition to LOPA-2 LOSS OF ALL AC POWER RECOVERY/SI NOT REQUIRED, or LOPA-3 LOSS OF ALL AC POWER RECOVERY/SI REQUIRED. FRPs would not be implemented in LOPA-1. The first two steps of LOPA-2 and LOPA-3 are identical to LOPA-1 in that FRPs are not to be implemented until directed.

In ALL cases, FRPs will NOT be implemented in LOPA-1.

— The second part of the choice b is correct because of the following:

Even though both plants were said to be tripped in the question stem, it is fair to determine that the plant is not tripped until confirmed in EOP-TRIP-1 Step 2. Therefore, there are two possible procedure paths, the transition to LOPA-1 after the trip has been confirmed, or the implementation of FRSM-1 based on the reactor trip NOT being confirmed at Step 2. In this case, implementation of FRSM-1 would occur if the reactor trip was not confirmed, and as such would make the second part of choice b correct.

NRC Response:

Comment accepted. Choice b is an additional correct answer. LOPA 1 indeed does not permit FRPs to be performed until after the procedure is exited (which is when power is restored to at least one 4KV vital bus). Second, since the provided plant conditions (“... both units trip”) do not make clear whether the units are shutdown, i.e., are the trips *confirmed*, it is reasonable for an applicant to determine one or both units may have experienced an anticipated transient without trip (ATWT). If so, TRIP-1 requires that FRSM-1 (a FRP) be implemented prior to exiting TRIP-1. The facility provided excerpts from LOPA-1, TRIP-1, and the Salem EOP basis documents verifying the above.