



**Boston Edison**

Pilgrim Nuclear Power Station  
Rocky Hill Road  
Plymouth, Massachusetts 02360-5599

October 28, 1998  
BECo Ltr. 2.98.140

U.S. Nuclear Regulatory Commission  
Region I  
475 Allendale Road  
King of Prussia, PA 19406

Docket No. 50-293  
License No. DPR-35

Pilgrim Station's 1998 NRC Initial License Written Examination Comments

The written examination administered on October 16, 1998, was considered to be an in-depth examination, which fairly tested the four (4) SRO and five (5) RO candidates knowledge in the appropriate areas.

In accordance with NUREG-1021 (Interim Rev. 8), Section #5 of ES-402, specific requests on several written exam questions are submitted for your consideration in Enclosure 1. Enclosure 2 contains the reference documentation associated with each of the requests.

If you have any questions or comments, please contact Mark Santiago at (508)830-7612 or Scott Willoughby at (508) 830-7638.

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ENCLOSURE 1

1. **Question # 115**  
SRO Exam Question #91  
RO Exam Question # N/A

A turbine building sump pump has been cleared for routine maintenance. The tagout has been accepted, and a maintenance Red Tag has been hung. No work has been done to the pump. A problem has developed with the other sump pump, making it necessary to place the cleared pump back in service. The tagout requestor is NOT onsite to remove his Red Tag.

Which ONE (1) of the following individuals is the MINIMUM level of authority required to authorize removal of the Red Tag?

- a. Operations Department Manager (ODM)
- b. Any Maintenance Supervisor
- c. The Nuclear Operations Supervisor (NOS)
- d. The Nuclear Watch Engineer (NWE)

ANSWER: d.

**DISCUSSION:**

Not enough information is provided in the stem of the question to allow the candidate to properly answer the question. The applicable section of the referenced procedure is attached. A review of this reference reveals the following:

Answer "d" allows the NWE to "release" the tagout "if an emergency condition exists and the individual authorizing the work is unable to be contacted." An "emergency" is clarified to mean threatening to the plant or personnel safety. The stem describes a condition involving a turbine building sump pump. Without additional supporting information, it is difficult to assume that this is a true emergency condition. Additionally, the stem states that the tagout requester is not on-site. It does not specify that the requestor cannot be contacted by telecon, as would be the expected action for a non-emergency condition. Additionally, distractor "b" could be interpreted as correct since a "responsible" supervisor can also release the tagout after verifying that the tagout can be safely removed.

**REQUEST (Question # 115):**

The question was intended to test the requirements for clearing a tagout during an emergency. Since the question does not present such a situation, we request that this question be deleted from the examination.

**REFERENCE**

NOP 1.4.5, "PNPS Tagging Procedure," p. 42

**2. Question # 124**

SRO/RO Exam Question #96

You are required to enter an area that contains a radiation source. This source is causing dose rates of 1200 mrem/hour at 30 cm from the surface of the source.

Which ONE (1) of the following is REQUIRED?

- a. The NWE must authorize entry.
- b. Two persons are required for entry: one must be an RPT.
- c. RP Personnel must either establish stay times or provide line of site coverage.
- d. One person may enter alone, but another person dressed in the required protective clothing must be standing by.

ANSWER: d.

**DISCUSSION:**

The keyed answer is not correct. There is no requirement in station procedures for this. The selection of "d" as the correct answer was determined to be a "typo". The proposed correct answer was "c". However, further review reveals that regarding entry to a high RAD area, distractor "b" is also correct (see the explanation below). The applicable section of procedure 6.2-014 is attached and is quoted below.

- Per procedure 6.1-014, Section 6.0 [3], p. 8:  
"At least two people are required to effect entry into a LHRA or VHRA, one of which must be an RP person." This makes answer "b" correct.
- Per procedure 6.1-014, Section 8.2 [5], p. 11:  
"....stay times....shall be established by RP prior to entries into LHRAs. In lieu of stay times, line of sight RP coverage may be provided." This makes answer "c" correct.
- No procedural basis justifying answer "d" could be located.

**REQUEST (Question # 124):**

Answer key should be changed to accept either "b" or "c" as the correct answer.

**REFERENCE:**

PNPS Procedure 6.1-014, Rev. 5, p. 8 and 11

3. **Question # 69**  
SRO Exam Question #37  
RO Exam Question #50

The plant is operating at 100% power.

Which ONE (1) of the following conditions would cause automatic closure of the condenser vapor valves and subsequent loss of main condenser vacuum?

- a. 70 psig steam pressure to the SJAE inlet.
- b. 10 psig downstream of the SJAE Condenser.
- c. 6000 lbm/hr steam flow to the jet compressor.
- d. 280 degrees F downstream of the SJAE Condenser.

ANSWER: a.

**DISCUSSION:**

The proposed answer "a" is incorrect. The applicable page of the reference text is attached and an excerpt follows:

Main Condenser and Offgas System reference text, Rev. 1, p. 9 of 33 states:

"These vapor valves will auto-close if a hydrogen explosion condition, (temp. greater than 250° or pressure greater than 35 psig), is sensed in the off-gas system piping downstream of the After-Condenser. Auto-closure of the vapor valves also occurs if either air ejector steam supply pressure decreases to 40 psig, or if A.O.G. jet compressor flow decreased to 2750 lbm/hour."

The applicable operating procedure is also attached and an excerpt follows:

"Low main steam pressure to the SJAE inlet regulator of less than 50 psi and the **OVERRIDE LOW DRIVE STEAM PRESSURE** switch in "PRESS" will close the four vapor valves to the SJAE and annunciate the alarm on Panel CP600." This makes answer "a" incorrect, since pressure is greater than the setpoint.

"High temperature upstream of the 30 minute holdup pipe of greater than 250° will close the four vapor valves to the SJAE and annunciate the alarm on Pane CP600." This makes answer "d" correct.

**REQUEST (Question # 69):**

Change correct answer to "d".

**REFERENCE:**

Main Condenser Vacuum and Air Removal reference text, p. 9.  
Procedure 2.2.93, Rev. 35, p. 9 of 64.

ENCLOSURE 2

6.7.2 Normal Tagout Continued)

(h) **Block 27 (TAGOUT RELEASED BY/DATE/TIME)** A tagout may be released by the individuals/designees signed onto the tagout when any of the following conditions are met: These conditions shall be verified by the individual releasing the tagout (i.e., if Responsible Supervisor A has performed the work, Responsible Supervisor B may release the work as long as he or she has personally verified one of the following).

- (1) All work for which the individual accepting the tagout was responsible for has been completed.
- (2) All work has not been completed, the MR is to remain outstanding, but the work is completed to the point where isolation is no longer required.

Tagout release via telecon with the individual performing the physical work is permitted as long as the conversation is held with the NWE or the NOS and witnessed by one other Control Room Operations person. Both Operations personnel involved with the telecon shall sign the TAGOUT RELEASE portion of the Tagout.

- (1) If an emergency condition (threatening to the plant or personnel safety) exists, the NWE may sign off the tagout for an individual not able to be contacted.

[7] When all jobs performed under a tagout are complete, the tagout may be closed out through the completion of the TAGOUT REMOVAL section of the Tagout Sheet.

[8] Tagout Removal - Section 5

(a) **Block 28 (ALL JOBS RELEASED)**

This question is a reminder to verify all applicable work packages/Procedures and tagouts (if this was a Master) have been released from this tagout.

(b) **Block 29 (EQUIPMENT VENT IAW PNPS 2.1.11.1)**

The NOS shall determine whether the closeout of the tagout will require a system fill and vent. Instructions for determining the need to fill and vent systems are contained in PNPS 2.1.11.1.

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## 5.0 SPECIAL TOOLS AND EQUIPMENT

- [1] Appropriate keys and key lockers
- [2] Appropriate locking systems which function to the standards listed in Attachment 4
- [3] Radiation survey instruments and alarming dosimeters as required by applicable Radiation Work Permits
- [4] Flashing lights, when applicable

## 6.0 PRECAUTIONS AND LIMITATIONS

- [1] Each LHRA and VHRA shall be locked or guarded at all times.
- [2] Only Radiation Protection (RP) personnel may admit a person to an LHRA or VHRA.
- [3] At least two people are required to effect entry to an LHRA or VHRA, one of which must be an RP person.
- [4] Equipment and material, (e.g., hoses, cords, etc.) will not be positioned between the door and frame of an LHRA or VHRA unless approved by Radiation Protection.
- [5] Two persons, one of whom is a Radiation Protection Technician (RPT) or Radiological Operations Supervisor (ROS), shall check doors used to access or exit an LHRA or VHRA upon leaving the area and verify them locked.
- [6] An RPT shall check all accessible doors to an LHRA or VHRA upon leaving the area and verify them locked. **[NRC LER 89-005-00]**
- [7] When exiting an area secured by an egress restricting device (e.g., chain and lock), verify that all personnel have left the area prior to locking the door. Control of Locked High Radiation Areas (LHRAs) shall be maintained such that no individual is prevented from leaving the area.
- [8] An RPT or an ROS who has been issued a VHRA key shall not give the key to anyone except the RPDM/designee.
- [9] An RPT or an ROS who has been issued an LHRA or VHRA key shall return the key to the Radiological Operations office or the RPDM/designee, as appropriate, and ensure that it is signed in before he or she leaves site.

## 8.2 LOCKED HIGH RADIATION AREA (LHRA) ACCESS/EGRESS

- [1] In addition to the access requirements for HRAs, areas classified as LHRAs shall be locked or guarded.
- [2] Prior to entering an LHRA, the RP person who has been issued the "R" key shall perform the following:
  - (a) Obtain an LHRA/VHRA Verification Record (Attachment 5) which lists all accessible entrances for the area to be entered. Those areas not entered shall be marked "N/A" on Attachment 5.
  - (b) Carry this LHRA/VHRA Verification Record to the area.

### NOTE

LHRAs under constant visual observation and control of Radiation Protection personnel are exempt from the requirements of Attachment 6.

- [3] A door guard (normally supplied by the work group) is required for all entries into LHRAs. The door guard shall be briefed and shall perform his/her duties in accordance with Attachment 6.
- [4] Only RP personnel may allow entry into an LHRA.
- [5] The RWP shall specify the maximum stay time for each LHRA. In addition, stay times based on individual's available exposure or the RWP ADA shall be established by RP prior to entries into LHRAs. In lieu of stay times, line of sight RP coverage may be provided. Remote continuous coverage (TV camera) with continuous communication (head sets) should be used when practical.
- [6] The work crew shall exit the LHRA via the same door they used to enter unless otherwise directed by RP.
- [7] The doors to the LHRA shall be verified to be closed and locked in accordance with Section 8.7 after exit. **[NRC LER 89-005-00]**
- [8] For individual High Radiation Areas with radiation levels of  $\geq 1000$  mrem/hr accessible to personnel that are located within large areas such as Reactor containment, where no enclosure exists for purposes of locking or that cannot be continuously guarded, and where no enclosure can be reasonably constructed around the individual area, that individual area shall be barricaded and conspicuously posted, and a flashing light shall be activated as a warning device unless otherwise authorized by the RPM.

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## 4.2 SYSTEM AUTOMATIC RESPONSE

- [1] Low main steam pressure to the SJAE inlet regulator of less than 50 psi and the OVERRIDE LOW DRIVE STEAM PRESSURE switch in "PRESS" will close the four vapor valves to the SJAE and annunciate the alarm on Panel CP600.
- [2] High temperature upstream of the 30 minute holdup pipe of greater than 250°F will close the four vapor valves to the SJAE and annunciate the alarm on Panel CP600.
- [3] High pressure upstream of the 30 minute holdup pipe of greater than 35 psi will close the four vapor valves to the SJAE and annunciate the alarm on Panel CP600.
- [4] Low steam flow to Offgas Jet Compressors and the OFF GAS LOW FLOW BYPASS switch in "NORMAL" will close the four vapor valves to the SJAE and annunciate the alarm on AOG Control Panel CP600.
- [5] If the mechanical vacuum pump is in service and an isolation signal is received from the main steam line radiation monitors, the mechanical vacuum pump will trip and its discharge valve 8-AO-3712 will close.
- [6] The mechanical vacuum pump will trip on low seal water flow of 15 GPM.
- [7] On decreasing vacuum in the condenser, less than 25" Hg causes low vacuum alarm, less than 22" Hg causes turbine trip, and less than 7" causes bypass valves trip.
- [8] If the radiation monitors upstream of the charcoal beds (RM-1705-3A/3B) are selected and BOTH these monitors receive a high radiation signal,

### OR

If the radiation monitors downstream of the charcoal beds (RM-1705-5A/5B) are selected and BOTH these monitors receive a high radiation signal,

### THEN

- (a) Offgas stack isolation valve 8-AO-3751 closes after 15 minute timer has timed out.
  - (b) Offgas 30 minute loop seal holdup line drain valve 8-AO-3750 closes.
- [9] The offgas holdup line loop seal drain valve 8-AO-3750 will close on low level in the loop seal drain pot and alarm on Panel CP600.
  - [10] The SJAE after-condenser loop seal drain valve 8-AO-9071 will close on low level in the loop seal drain pot and will alarm on Panel CP600.
  - [11] If any of the air ejector vapor valves are not fully open, annunciator "VAPOR VALVE NOT FULL OPEN" (CP600L-A1) will alarm.

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## C. COMPONENT DESCRIPTION

### 1. Main Condenser Vapor Valves (Figure 2)

The air removal system draws from condensers "A" and "B". Each condenser has two suction lines with 12 inch butterfly type air-operated isolation valves. AO-3703 and AO-3710 for condenser "A"; and AO-3704 and AO-3711 for condenser "B". The vapor valves are controlled from panel C-10 by control switches CS-SV-3703, 10, 04 and 11, using control power from Y-1, (valves fail closed upon loss of control power). These vapor valves will auto-close if a hydrogen explosion condition, (temp. greater than 250<sup>o</sup>, or pressure greater than 35 psig), is sensed in the off-gas system piping downstream of the After-Condenser. Auto-closure of the vapor valves also occurs if either air ejector steam supply pressure decreases to 40 psig, or if A.O.G. jet compressor flow decreases to 4500 lbm/hour.

During a plant startup, it is necessary to bypass both the low S.J.A.E. steam supply pressure auto-closure feature, and the low A.O.G. jet compressor flow auto-closure feature, to open the vapor valves and provide a suction path for our mechanical vacuum pump to be used to draw the initial condenser vacuum. Consequently, both a "AOG Strm Dilution Low Flow Bypass Switch" and a "Ejector Low Press Override Switch" are provided on Panel C-10. These switches also enable or disable associated control room alarms. The two condenser suction lines join to form one line for each condenser.

A vacuum breaker line is connected to main condenser "A" just upstream of AO-3710. This line has two isolation valves (AO-3707 and AO-3708) between the condenser and room air. The air-to-open and air-to-close valves are in series, and are controlled with pushbuttons on panel C-2. The valves are opened when it is desired to rapidly decrease vacuum (ie., to stop the turbine quickly as on a turbine vibration problem, or to prevent damage to turbine seals when no steam is being supplied).