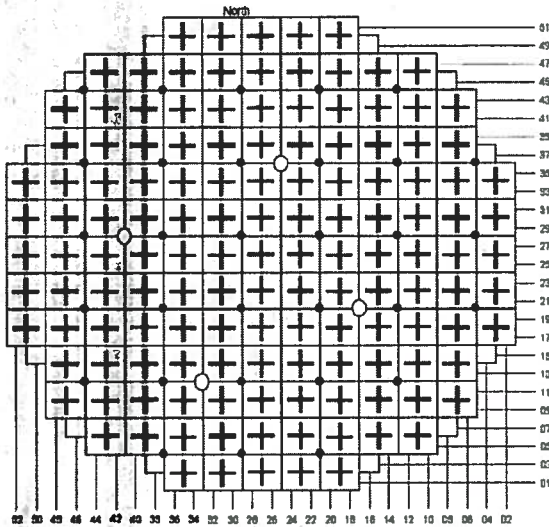


December 2015 (ILT 2015) Initial License Examination

During a startup on Unit Two, control rod 30-39 is desired to be moved continuously from 12 to 48.



The minimum number of RMCS control switches needed to accomplish this control rod movement is (1).

A. (1) one
(2) B

B. (1) one
(2) C

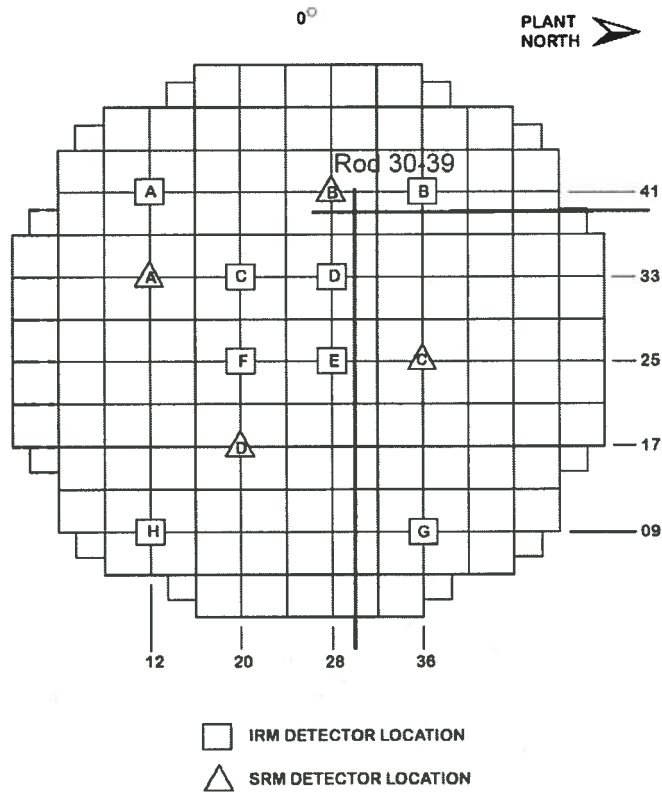
C. (1) two
(2) B

D. (1) two
(2) C

In accordance with NUREG-1021, Operator Licensing Examination Standards for Power Reactors, ES-403, Section D.1.b, the wrong answer being selected on the answer key, the **facility recommends that the correct answer be changed from 'D' to 'C'.**

Part 2 of the question identifies the wrong SRM Channel. It is the B SRM detector, instead of C. The validation of the question did not identify this error.

FIGURE 09.1- 2
IN-Core Instrumentation Location Diagram



SRM	CORE LOCATION
A	12-33
B	28-41
C	36-25
D	20-17

IRM	CORE LOCATION
A	12-41
B	36-41
C	20-33
D	28-33

IRM	CORE LOCATION
E	28-25
F	20-25
G	36-09
H	12-09

RO/SRO Question #75

In preparation for a valve manipulation in the drywell, the applicable RWP indicates that the highest dose rate in the area is 350 mR/hr. A flashing red light is encountered at the entry location to the valve in the drywell.

Which one of the following completes both statements below?

The flashing red light indicates the area is a (1).

This RWP (2) be used to perform the valve manipulation.

- A. (1) high radiation area
(2) can
- B. (1) high radiation area
(2) can NOT
- C. (1) locked high radiation area
(2) can
- D. (1) locked high radiation area
(2) can NOT

In accordance with NUREG-1021, Operator Licensing Examination Standards for Power Reactors, ES-403, Section D.1.b and c, **the facility recommends that the correct answer be changed from 'D' to 'C'.**

Part 2 of the question is the item of concern. The stem of the question states that 'the applicable RWP indicates that the highest dose rate in the area is 350 mR/hr.' RWPs used to enter Locked High Radiation Areas routinely indicate radiation alarms and doses below 1 R/Hr. One example is attached.

Based on the attached RWP the operator would enter this Locked High Radiation area.

INFORMATION

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**Brunswick Nuclear Plant
Radiation Work Permit**

INFORMATION

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Operations - Routine Plant Operation - Rounds

RWP # 23

Rev: 04

Task # 5

Operations-Routine Plant Operation- Rounds - LHRA/CA - Low
Risk

ED Alarm Set Points:

Dose Alarm: 80 mrem

Dose Rate Alarm: 400 mrem/hr

LHRA <10R/hr Entry

RWP Requirements

RP Hold Points

- RP survey required prior to handling debris or foreign material
- RP survey required after removal of items from contaminated systems. Decon may be necessary (as directed by RP)
- Notify RP prior to reaching OR entry into the overhead (8 feet and above)
- If Accumulated Dose is Higher Than Expected - Notify RP
- RP briefing required prior to entering High Radiation Areas
- RP briefing required prior to entering Looked High Radiation Areas
- Contact Radiation Protection (RP) PRIOR TO grinding, cutting, buffing or any other abrasive activities that may create airborne activity.
- No contaminated system breach or aggressive/abrasive work in contaminated areas on this Low Risk task
- Contact RP Prior to Transporting Radioactive Material that could Result in a Radiological Posting Change (>4 mrem/hr @ 30 cm)
- Contact RP prior to removing any radioactive material from any RCA/RMA or powerblock.
- No work on this task in verified Alpha Level 2 or Level 3 Areas
- Do not alter Radiological boundaries, shielding, fences or barriers without RP approval
- Adhere To Work Instructions, Stay Times, And Survey Requirements Specified in The Pre-Job Briefing

Stop Work Criteria

- Dose Alarm - Stop Work - Exit Area - Notify RP
- Unanticipated Dose Rate Alarm or Third Anticipated Dose Rate Alarm - Stop Work - Exit the Area - Notify RP
- If Actual Beta-Gamma or Alpha Contamination Levels Are Higher Than The Expected Levels Written On This RWP Task - Stop Work - Exit the Area - Notify RP
- Work Scope Changes - Stop Work - Notify RP
- Any Conditions Not As Briefed and Expected - Stop Work - Notify RP
- If accumulated dose reaches 80% of ED setpoint - Stop Work - Exit the Area - Notify RP

Expected Radiological Conditions

General area dose rates: <1 mrem/hr - 1000 mrem/hr
High contact dose rates: 100 mrem/hr - 2000 mrem/hr
Contamination levels: <1000 dpm/100cm² - <50,000 dpm/100cm²

RO/SRO Question #75

In preparation for a valve manipulation in the drywell, the applicable RWP indicates that the highest dose rate in the area is 350 mR/hr. A flashing red light is encountered at the entry location to the valve in the drywell.

Which one of the following completes both statements below?

The flashing red light indicates the area is a (1).

This RWP (2) be used to perform the valve manipulation.

- A. (1) high radiation area
(2) can
- B. (1) high radiation area
(2) can NOT
- C. (1) locked high radiation area
(2) can
- D. (1) locked high radiation area
(2) can NOT

In accordance with NUREG-1021, Operator Licensing Examination Standards for Power Reactors, ES-403, Section D.1.b and c, **the facility recommends that the correct answer be changed from 'D' to 'C'.**

Part 2 of the question is the item of concern. The stem of the question states that 'the applicable RWP indicates that the highest dose rate in the area is 350 mR/hr.' RWPs used to enter Locked High Radiation Areas routinely indicate radiation alarms and doses below 1 R/Hr. One example is attached.

Based on the attached RWP the operator would enter this Locked High Radiation area.

This position paper is written to support changing Exam Question #75, which provided the following:

- The area in question had a flashing light at the entrance.
- The operator had an approved dose rate of 350 mR/hr.

The assumption written during exam constructed was that the operator must know:

- That a flashing red light is indicative of a LHRA
- A LHRA is doses in excess of 1000 mR/Hr
- That his dose of 350 mR/Hr could be exceeded, therefore he could not perform this job.

Upon further review, it was identified that in fact, the operators at BNP may enter a LHRA with dose rate settings less than 350 mR/Hr. This requires the answer to be changed to reflect this new information.

Per discussions with the Radiation Protection Manager:

A LHRA posted simply means there is exposure rates of 800 mR/hr @30 cm (plant procedures) or 1000 mR/hr @30 cm (10CFR20 requirements) accessible inside the posted area. It does not mean a work area is 800 or 1000 mR/hr general area dose rates. The confusion seems to be related to the dose rate set point for the electronic dosimeter (ED). Most dose rate set points (documented in RWP) are less than the dose rate level where the posting is required. In this case 350 mR/hr is a reasonable dose rate set point for an RWP for work inside the Drywell (or any posted LHRA). The ED set points are designed to be used as a tool to maintain workers in the lowest dose rate areas that are expected for that area. We establish ED set points using TE-RP-ALL-2000 (Preparation of Radiation Work Permit). TE-RP-ALL-2000 Attachment 7 gives ALARA planners the guidance for establishing RWP ED set points. The entire procedure is included for your review, but the critical information can be found in section 5 of Attachment seven:

5. Use the following formula as a guide in determining the ED DOSE RATE setpoint:

- *For TWADR less than 100 mrem/hr, multiply the TWADR by 1.5 (round to the next highest 10 mrem/hr). This is your ED Dose Rate set point.*
- *For TWADR greater than 100 mrem/hr, multiply the TWADR by 1.25 (round to the next highest 50 mrem/hr). This is your ED Dose Rate set point.*

TWADR stands for typical work area dose rate.

The set point is not tied to the posting its tied to the work area dose rate.

Attached are excerpts from BNP procedures that:

1. Identifies that LHRA access requires a RWP and RWP Task that specifies allowed Dose Rate Levels (Step 5 of Attachment 1 of this document).
2. Allows the LHRA entry with a requirement to calculate total dose, based on dose rates and time inside the LHRA (Attachment 2 of this document).
3. Provides guidelines for using flashing lights to identify a LHRA (Attachment 3 of this document).
4. Shows that routine operator tasks and rounds are permitted in a LHRA. (Attachment 4 of this document).

Attachment 1 and 2 of this document to validate procedural steps and the checklist to allow entry.

Attachment 3 of this document supports using a flashing light to identify a LHRA.

Attachment 4 – Risk Assessment Guidelines shows that routine operator tasks and rounds are permitted in a LHRA.

Attachment 5 – Current RWP Example

Attachment 1- Copy of actual procedure step 5.1

ACCESS CONTROLS FOR HIGH, LOCKED HIGH, AND VERY HIGH RADIATION AREAS	AD-RP-ALL-2017
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5.0 INSTRUCTIONS

5.1 General Instructions

1. Weekly verification of controls for restricting access to high and very high radiation areas is performed by site specific processes. [7.3.5]
2. Free egress requirements must be maintained at all times for HRA, LHRA, and VHRAs.
 - a. Locking a swing gate or turnstile is not considered preventing an individual from being able to exit the area.
 - b. The use of a padlock or unique locking device (ULD) requires verifying the area is unoccupied prior to locking the area.
3. If there is no sound operational reason or there is a safety concern, then do not allow access to VHRA.
4. If at any time a HRA, LHRA, or VHRA cannot be secured (e.g., failed barricade, broken lock, inoperable flashing light), then guard the area until it can be secured.
5. LHRA access requires an RWP and RWP task that specifies the dose rate levels in the immediate work area on the RWP.

Attachment 2 –Accessing LHRA Checklist

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Accessing LHRA Checklist

ATTACHMENT 6

Page 1 of 1

<input type="checkbox"/>	Obtain RP supervision approval to enter LHRA and issue LHRA key
<input type="checkbox"/>	< 10 Rem/hour – RP Supervisor or RP General Supervisor:
<input type="checkbox"/>	≥ 10 Rem/hour – RPM (or designee):
<input type="checkbox"/>	Complete the following general verifications (may be performed in any order):
<input type="checkbox"/>	Verify workers are using the correct RWP and RWP Task
<input type="checkbox"/>	Verify ED setpoints are appropriate for the work area
<input type="checkbox"/>	Verify radiological briefing (both RWP and ALARA Plan if issued) is completed per AD-RP-ALL-2011, Radiation Protection Briefings
<input type="checkbox"/>	Verify operable dosimetry, including ED and telemetry (if required), and device placement as required by the RWP. Conduct immediately prior to LHRA entry
<input type="checkbox"/>	Verify each worker has a Pocket External Alarm (PEA) or equivalent
<input type="checkbox"/>	Verify continuous RP coverage is assigned as required by the RWP
<input type="checkbox"/>	Verify stay time has been determined and timekeeper is assigned if worker is expected to receive > 500 mrem per entry or if work area is > 1.5 Rem/hour, and ensure Attachment 10, Stay Time Calculation and Time Keeper Worksheet, is completed. {7.1.2}
<input type="checkbox"/>	Verify communications equipment is operable if used
<input type="checkbox"/>	Obtain LHRA key for area
<input type="checkbox"/>	Ensure area access controls are established, including acceptable locking devices (room lock, padlock, unique locking device, flashing light if approved) and access control guard established if required
<input type="checkbox"/>	Perform the following upon LHRA exit:
<input type="checkbox"/>	Verify all workers have exited the area
<input type="checkbox"/>	Ensure area is secured and locked (or flashing light established if approved) (signature) Peer checked by (signature):

Attachment 3 – Use of Flashing red lights to Establish a LHRA

ACCESS CONTROLS FOR HIGH, LOCKED HIGH, AND VERY HIGH RADIATION AREAS
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ATTACHMENT 3 Page 1 of 1

Use Of Flashing Lights To Establish LHRA Checklist

1.	Obtain RPM (or designee) approval to establish LHRA with flashing light(s). RPM: _____ Date and Time: _____ <input type="checkbox"/> Justification for allowance of Flashing Lights _____ _____ _____
2.	Establish LHRA with Tech. Spec. flashing light(s) by performing the following: <input type="checkbox"/> Install barricades to prevent inadvertent access <input type="checkbox"/> Post conspicuously <input type="checkbox"/> Position flashing light (s) so clearly visible when approached <input type="checkbox"/> Activate flashing light(s) <input type="checkbox"/> If using AC powered light(s), then ensure drop cords tagged at each connection and at each receptacle to prevent unauthorized de-energizing of the light(s) <input type="checkbox"/> Using DC (battery) powered lights
3.	Flashing Light installed by (signature): _____ Date and Time: _____
4.	ANSI-qualified RP Technician Peer check (signature): _____ Performed by (signature): _____ Date and Time: _____ RP Supervisor verification performed by (signature): _____ Date and Time: _____
5.	Log establishment and use of flashing light in electronic RP log. Log entry by: _____ Date and Time: _____
6.	RPM Approval (signature): _____ Date and Time: _____

Attachment 4 – Risk Assessment Guidelines

This shows that routine operator tasks and rounds are permitted in a LHRA.

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ATTACHMENT 9

Page 1 of 5

RWP Type and Risk Assessment Guidelines (Information Use)

[RNP, CR3, BNP, HNP] (9.1.1 SOER 01-1) (9.1.2 IER 11-41)

Low Risk Activities GENERAL RWP (LR)

- No High Radiation Areas (HRAs) and no Locked High Radiation Areas (LHRAs) other than routine tasks for operations rounds, HP surveillances, inspections, and routine PM's in these areas.
- No Hot Particle Areas (HPAs).
- Activities that will **NOT** change radiological conditions in the plant (for example dose rates, contamination levels, air quality).
- No aggressive work activities in contaminated areas that could change the radiological conditions.

Attachment 5

**INFORMATION
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Brunswick Nuclear Plant Radiation Work Permit

**INFORMATION
USE ONLY**

Operations - Routine Plant Operation - Rounds

RWP # 23

Rev: 04

Task # 5

Operations-Routine Plant Operation- Rounds - LHRA/CA - Low
Risk

ED Alarm Set Points:

Dose Alarm: 80 mrem

Dose Rate Alarm: 400 mrem/hr

LHRA <10R/hr Entry

RWP Requirements

RP Hold Points

- RP survey required prior to handling debris or foreign material
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- Contact Radiation Protection (RP) PRIOR TO grinding, cutting, buffing or any other abrasive activities that may create airborne activity.
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Expected Radiological Conditions

General area dose rates: <1 mrem/hr - 1000 mrem/hr
High contact dose rates: 100 mrem/hr - 2000 mrem/hr
Contamination levels: <1000 dpm/100cm² - <50,000 dpm/100cm²

SRO Question #83

Unit One is in MODE3, performing a reactor shutdown IAW GP-05, Unit Shutdown, in preparation for a refueling outage.

Which one of the following completes both statements below?

IAW TS3.4.9 RCS Pressure and Temperature Limits, the maximum cooldown rate is limited to ____ (1) ____ change in any one hour period.

If the cooldown rate is exceeded, the NRC ____ (2) ____ required to be notified IAW 10CFR50.72, Immediate Notification Requirements for Operating Nuclear Power Reactors.

- A. (1) 50°F
(2) is
- B. (1) 50°F
(2) Is NOT
- C. (1) 100°F
(2) is
- D. (1) 100°F
(2) is NOT

In accordance with NUREG-1021, Operator Licensing Examination Standards for Power Reactors, ES-403, Section D.1.b and c, **the facility recommends that this question be removed** due to there being two opposing correct answers C and D.

Concerning part 2 of the question, the condition in the stem states that the cooldown rate has been exceeded. However, this statement is not bounded by a magnitude of violation. In addition, this statement is not bounded by a duration of the violation.

The tech spec 3.4.9 basis states, "Violation of the limits places the reactor vessel outside of the bounds of the stress analyses and can increase stresses in other RCS components. The consequences depend on several factors, as follows:

- a. The severity of the departure from the allowable operating pressure temperature regime or the severity of the rate of change of temperature;
- b. The length of time the limits were violated (longer violations allow the temperature gradient in the thick vessel walls to become more pronounced)

Therefore, based on the absence of specific information in the stem of the question it calls into question whether a principal safety barrier would or would not have been degraded. See NUREG-1022 Rev 3 page 25. It is the position of Site Licensing that, because the question does not provide the magnitude and length of time the limits were violated during the cooldown event, there is insufficient information to determine reportability. Additionally, engineering input would likely be necessary to determine if a significant cooldown event resulted in the plant being seriously degraded (i.e., reportable to the NRC per 10 CFR 50.72(b)(3)(ii)). Therefore, reportability in accordance 10CFR50.72 is indeterminate.

SRO Question #88

Unit One is performing a shutdown with the following plant conditions:

- Reactor mode switch Shutdown
- Reactor water level 195 inches
- Shutdown Cooling B Loop RHR In Service
- RCS Intact
- RHR Hx Inlet Temperature 214°F
- RHR Hx Outlet Temperature 210°F

A loss of Off-Site power occurs with all 4 DGs starting and loading.

Thirty minutes later, Shutdown Cooling has been returned to service with the following plant conditions:

- Reactor water level 225 inches
- RHR Hx Inlet Temperature 244°F
- RHR Hx Outlet Temperature 241°F

Which one of the following completes the statements below?
(reference provided)

A MODE change ____ (1) ____ occurred.

The highest EAL classification for this event is an ____ (2) ____ .

- A. (1) has
(2) Unusual Event
- B. (1) has
(2) Alert
- C. (1) has NOT
(2) Unusual Event
- D. (2) has NOT
(2) Alert

In accordance with NUREG-1021, Operator Licensing Examination Standards for Power Reactors, ES-403, Section D.1.b and c, **the facility recommends that the correct answer be changed from 'D' to 'C'.**

The initial conditions, prior to the loss of offsite power, state that the Mode switch is in Shutdown, and that the RHR Hx Inlet Temperature is 214°F. According to T.S. Table 1.1-1, this places Unit One in MODE 3 due to the mode switch position and average reactor coolant temperature >212°F. The EAL chart for MODE 3 does not contain a classification for an ALERT based on the conditions given. The only applicable classification is an UNUSAL EVENT based on the Loss of Offsite Power for >15 minutes. There are no other conditions that apply.

Based on the choices given, C is the Correct answer. There is no MODE change, and an Unusual Event is the highest EAL classification.

SRO Question 96

Which one of the following completes both statements below IAW AD-WC-ALL-0200, On-Line Work Management?

The work week schedule is locked/frozen at the (1) Schedule Freeze Meeting.

After the work week is frozen, if FIN team work is required, an On-line/Outage Scope Change Request (2) required.

- A. (1) T-3
(2) is
- B. (1) T-3
(2) is NOT
- C. (1) T-10
(2) is
- D. (1) T-10
(2) is NOT

In accordance with NUREG-1021, Operator Licensing Examination Standards for Power Reactors, ES-403, Section D.1.b, the **facility recommends that the question be deleted from the exam**, as it is NOT SRO –Level Knowledge. This question does not contain a direct tie to the licensing duties of an SRO and is performed outside of the control room. This process is not specific to SRO and is performed by several different members of the organization including Maintenance and Work Control team members.