76. 212000G2.2.36 001/2/1/RPS/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

Unit 1 is shutdown with all control rods fully inserted. Shutdown cooling (SDC) loop "1B" is in service, with reactor coolant temperature at 185°F and all RPV head studs are fully tensioned.

I & C has just reported to the Shift Supervisor that due to an error in 57SV-C71-005-1, "RPS Power Monitors", the relays for power monitoring assemblies 1C71-P003A and 1C71-P003C for 1C71-S001A, RPS M/G Set "1A", were left at the following setpoints:

RPS M/G Set 1A Relays	"1C71-P003A" assembly	"1C71-P003C" assembly
1C71-K751A/C Overvoltage	131.5 volts	131.4 volts
1C71-K752A/C Undervoltage	107.6 volts	108.1 volts
1C71-K753A/C Underfrequency	56.8 Hz	57.7 Hz

Which ONE of the following completes both the statements for RPS Power Monitoring assemblies and Tech Specs?

___(1)___ of the RPS Power Monitoring assemblies is(are) inoperable. Tech Specs requires RPS "1A" M/G Set to be removed from service within the next ___(2)___ .

Reference provided

A. (1) ONLY one

(2) hour

B. (1) ONLY one

(2) 72 hours

C. (1) Two

(2) hour

D. (1) Two

(2) 72 hours

Description:
1C71-K751A and C (Both volts are within TS limits)
C71-K752A and C (A volts are outside TS limit)
C71-K753A and C (A Hz are outside TS limit)

The "A" assembly is inoperable due to Undervoltage and Underfrequency.
The "C" assembly is operable.
The candidate must understand the arrangement of the power monitoring assemblies and understand the basis for what constitutes an operable assembly. (It takes all three relays operable for each.) A candidate may believe that having two relays inoperable means that two power monitoring assemblies are inoperable.

A. **(1) Correct.** Only "A" assembly is inop
(2) Incorrect. Tech Specs allows 72 hours to remove the "1A" RPS M/G Set from service.
Plausible since two relays are inoperable and the candidate must know that both relays are part of one assembly. If two assemblies are considered inop, only 1 hour is allowed for removal of the RPS M/G Set from service.

B. **Correct.** K752 A is inoperable, but K752 C is operable.
This would be a 72 hours RAS.

C. **(1) Incorrect.** Only "A" assembly is inop
(2) Incorrect. Tech Specs allows 72 hours to remove the "1A" RPS M/G Set from service.
Plausible since two relays are inoperable and the candidate must know that both relays are part of one assembly. If two assemblies are considered inop, only 1 hour is allowed for removal of the RPS M/G Set from service.

D. **(1) Incorrect.** Only "A" assembly is inop
(2) Correct. Tech Specs allows 72 hours to remove the "1A" RPS M/G Set from service.
Plausible since two relays are inoperable and the candidate must know that both relays are part of one assembly.

Provide candidates a copy of Unit 1 Tech Spec Section 3.3.8.2, complete section.

SRO only because of tie to 10CFR55.43(2): Tech specs (1 hour distractor is not RO level because the data in the table must be analyzed and compared against the surveillance requirements.) Also knowledge in the bases is required to know the requirements of what constitutes an RPS electric power monitoring assembly .

SYSTEM: 212000 Reactor Protection System

2.2 Equipment Control

2.2YSTEM: 212000 Reactor Protection System

2.2.36 Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.
(CFR: 41.10 / 43.2 / 45.13) IMPORTANCE RO 3.1 SRO 4.2

Reference(s) used to develop this question:

Tech Specs 3.3.8.2
Tech Spec Basis 3.3.8.2
57SV-C71-005-1, RPS Power Monitors

Reference(s) provided to the student:
Unit 1 Tech Spec Section 3.3.8.2, complete section

77. 233000G2.1.28 001/2/2/FPCCU SKIMMER/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

Unit 2 is operating at 100% power.

A pipe rupture occurs in the Fuel Pool Cooling system at the BOTTOM of the "2A" Skimmer Surge Tank that can NOT be isolated.

Which ONE of the following answers both of these statements?

Fuel Pool water level __(1)__ go below the top of fuel assemblies seated in the Fuel Pool.

The operating shift team will enter ___(2)___.

A. (1) will

(2) 73EP-EIP-001-0, "Emergency Classification" declare an Alert emergency

B. (1) will

(2) 73EP-EIP-001-0, "Emergency Classification" declare an Notification Of Unusual Event

C. (1) will NOT

(2) 34SO-G71-001-0, "Decay Heat Removal" section 7.2, "System Startup and Operation"

D. (1) will NOT

(2) 34SO-E11-010-2, "Residual Heat Removal System" section 7.4.3, "RHR Assisted Fuel Pool Cooling"

Description: The skimmer surge tanks prevent draining an excessive amount of water from the fuel pool in case of a line break on the fuel pool cooling system suction lines. The lowest level the pool will drain to is 22.1' (normal is 22.4' to 22.7'). The purpose of the skimmer surge tank and the anti-siphon check valves often are confused. The skimmer surge tank on the suction from the pool and the anti-siphon check valves on the return to the pool. The difference is that the skimmer surge tank only allows the fuel pool to lower several inches and the antisiphon check valves prevent the pool from being drained completely since the return line goes all the way to the bottom of the pool.

A. **Incorrect.** Fuel pool level will not decrease below the top of the fuel and an Alert Emergency will not exist.
Plausible because if the candidate confuses the purpose of the skimmer surge tanks with the anti-siphon check valves. Both are designed to limit the loss of water from the pool, but if a line break occurred with the check valves failing, the pool would be drained to a level below the top of the fuel that is seated in the fuel pool. An Alert would exist if level decreased to the top of the fuel.

B. **Incorrect.** Fuel pool level will not decrease below the top of the fuel and a NUE will not exist.
Plausible because if the candidate confuses the purpose of the skimmer surge tanks with the anti-siphon check valves. Both are designed to limit the loss of water from the pool, but if a line break occurred with the check valves failing, the pool would be drained to a level below the top of the fuel that is seated in the fuel pool. An NUE would exist as a result of decreasing level, and then be upgraded to an Alert when level reached the top of fuel.

C. **Correct.** Level will not decrease below the top of the fuel, but a low suction pressure trip will occur and the Fuel Pool Cooling system will be lost . Decay heat removal will be required using the DHR system.

D. **Incorrect.** The RHR fuel pool cooling assist mode can not be placed in service with the current plant conditions. RHR must be in Shutdown Cooling to place fuel pool cooling assist mode.
Plausible because the first part is correct and for a different set of plant conditions, the RHR fuel pool cooling assist mode is a common method for removing decay heat from the fuel pool.

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure.

SYSTEM: 233000 Fuel Pool Cooling and Clean-up

2.1 Conduct of Operations

2.1.28 Knowledge of the purpose and function of major system components and controls.
(CFR: 41.7) IMPORTANCE RO 4.1 SRO 4.1

Reference(s) used to develop this question:
34SO-E11-010-2, "Residual Heat Removal System"
34SO-G41-003-2, "Fuel Pool Cooling and Cleanup System"
34AB-G41-001-2, "Loss of Fuel Pool Cooling"
34SO-G71-001-0, "Decay Heat Removal"
73EP-EIP-001-0, Emergency Classification and Initial Actions
G41-FPC-LP-04501, "Fuel Pool Cooling and Cleanup" EO 045.002.A.01, 045.030.A.02 and 045.022.A.01

Reference(s) provided to the student:
None

78. 239002G2.4.18 001/2/1/SRV/NEW/FUND/HT 2009-301/SRO/CME/ELJ/

IAW the Emergency Operating Procedures (EOPs), a shutdown reactor requires a minimum of __(1)___ Safety Relief Valves (SRVs) to open during an emergency depressurization.

The EOP Bases for this requirement is to ensure _____(2)_____.

A. (1) 5

(2) fuel clad temperature does NOT increase to a point where a Zirc-Water reaction becomes self-sustaining.

B. (1) 4

(2) fuel clad temperature does NOT increase to a point where a Zirc-Water reaction becomes self-sustaining.

C. (1) 5

(2) removal of decay heat from the reactor core at a pressure low enough that the RHR system will be capable of making up for the SRV steam flow.

D. (1) 4

(2) removal of decay heat from the reactor core at a pressure low enough that the RHR system will be capable of making up for the SRV steam flow.

Description; EOPs require a minimum of 5 SRVs to Emergency Depressurize the RPV. Prior to core loading for a "two year operating cycle", the Minimum Number of SRVs Required for Emergency Depressurization was 4. The increase in the amount of fuel loaded into the core necessitated the change to 5 SRVs.

The Minimum Number of SRVs Required for Emergency Depressurization is defined to be the greater of either:

1. The least number of SRVs which, if opened, will remove all decay heat from the core at a pressure sufficiently low that the ECCS with the lowest head will be capable of making up the SRV steam flow, **OR**
2. The least number of SRVs which correspond to a Minimum Alternate RPV Flooding Pressure sufficiently low that the ECCS with the lowest head will be capable of making up the SRV steam flow at the corresponding Minimum Alternate RPV Flooding Pressure.

A. **Incorrect.** see description above. 1st part is correct, 2nd part is not correct.
Plausible - The basis for 5 SRVs is that they will provide the steam flow necessary to maintain clad temperature below 1,500F. Self sustaining Zirc-Water reaction occurs at 2,200F.

B. **Incorrect.** see description above. 1st part is not correct (requires 5 SRVs). 2nd part is not correct
Plausible - since this is a plant EOP change from 4 SRVs to 5 SRVs. The basis for 5 SRVs is that they will provide the steam flow necessary to maintain clad temperature below 1,500F. Self sustaining Zirc-Water reaction occurs at 2,200F.

C. **Correct,** see description above.

D. **Incorrect.** see description above. 1st part is incorrect (requires 5 SRVs). 2nd part is correct.
Plausible - since this is a plant change EOP from 4 SRVs to 5 SRVs.

SRO only because of link to 10CFR55.43 (1): Conditions and Limitations in the facility license.

SYSTEM: 239002 Relief/Safety Valves

2.4 Emergency Procedures / Plan

2.4.18 Knowledge of the specific bases for EOPs.
(CFR: 41.10 / 43.1 / 45.13) IMPORTANCE RO 3.3 SRO 4.0

Reference(s) used to develop this question:

EOP CP-1 Flowchart
Lesson Plan EOP-CURVES-LP-20306, EOP Curves and Limits EO 201.085.A.17
BWROG Appendix B section 17.22

Reference(s) provided to the student:
None

79. 259002G2.4.20 001/2/1/RWL INSTRU/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

A transient occurs on **Unit 2** resulting in a Group 1 isolation and a steam line break inside the Drywell.

When the reactor scrammed, one control rod remained at position 48, all others fully inserted.

The following conditions exist:

- o Reactor pressure ..... has decreased from 1000 psig to 275 psig in the last 30 minutes
- o Reactor Water Level .....

2C32-R606A, B, and C (GEMACs)	Flashing observed
2B21-R623A & B wide range	- 85 inches
2B21-R623A fuel zone	- 155 inches
2B21-R623B fuel zone	Flashing observed

- o HPCI has just become available for injection

Based on the above conditions, actual reactor water level ____(1)____ .
The Shift Supervisor is required to ____(2)____

A. (1) is -85 inches

(2) slowly increase reactor water level using HPCI

B. (1) is -155 inches

(2) perform an Emergency Depressurization per CP-1.

C. (1) cannot be determined

(2) enter EOP Flowchart CP-2 and perform the RPV ATWS Flooding section

D. (1) cannot be determined

(2) enter EOP Flowchart CP-2 and perform the RPV NON-ATWS Flooding section

Description; In this question, none of the RWL instruments may be used. The candidate is expected to analyze plant conditions to come up with this determination. The candidate is told that flashing is directly observed on the GEMACs and one of the Fuel Zone Instruments. The candidate must know the reference legs for the 2C32-R606A-C RWL indicators are the same as for the Fuel Zone indicators, therefore the Fuel Zone instruments are not usable. When all RWL indication is lost, with a Cold Shutdown Rod Configuration, the EOPs direct emergency depressurization of the RPV and injection with all available sources at rated flow. EOPs caution 2 states that the wide range instruments are not to be used following a rapid depress (>100 degrees/hour) below 500 psig.

One control rod failing to insert with all other control rods fully inserted is a "Cold Shutdown Rod Configuration". This condition is not considered to be an ATWS situation. CP-2 flowchart will be entered and will direct opening 7 ADS valves.

A. **Incorrect,** see description above. 1st part is not correct (RWL can not be determined). 2nd part is not correct (ED with all available systems injecting is required).
Plausible if the candidate does not consider the rapid depress below 500 psig, but does consider the relationship between the Fuel Zone and GEMAC reference legs. Also 34AB-B21-002-2 states that SPDS and Wide Range RWL instruments are to be used when RPV level is above -100 inches. Also plausible because if RWL was -85", HPCI alone would be acceptable for injection.

B. **Incorrect,** see description above. 1st part is not correct (RWL can not be determined). 2nd part is a correct action.
Plausible if candidate recalls that the Wide Range instruments may not be used following a rapid cooldown to below 500 psig, but does not recall the relationship between GEMAC and Fuel Zone reference legs. Also because ED is required.

C. **Incorrect,** see description above. 1st part is correct (RWL can not be determined). 2nd part is not correct (non-ATWS flooding is directed)
Plausible since all control rods did not fully insert.

D. **Correct,** see description above.

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure.

SYSTEM: 259002 Reactor Water Level Control System

2.4 Emergency Procedures / Plan

2.4.20 Knowledge of the operational implications of EOP warnings, cautions, and notes.
(CFR: 41.10 / 43.5 / 45.13) IMPORTANCE RO 3.8 SRO 4.3

Reference(s) used to develop this question:

EOP Caution 1 and 2 on EOP flowcharts (also located in 34AB-B21-002-2)
EOP-RC-LP-20308, "RPV Control, Non ATWS" EO 201.085.A.05
34AB-B21-002-2, "RPV Water Level Corrections"

Reference(s) provided to the student:
None

80. 262002A2.01 001/2/1/VITAL AC/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

Unit 2 is operating at 100% power.

- o The alternate supply breaker to the Vital AC bus is tagged in the open position for maintenance.
- o The fuse downstream of the Static Inverter (between the Static Inverter and the Static Transfer Switch) blows.

Which ONE of the following predicts the impact of the blown fuse and identifies a procedure used to mitigate the consequences of this condition.

Vital AC ____(1)____ go on battery backup.

The SS direction to the crew is to ____(2)_____.

A. (1) will NOT

(2) enter 34AB-N21-001-2, "Loss of Feedwater Heating"

B. (1) will

(2) enter 31GO-OPS-019-0, "Use of the Emergency Fuse Kit"

C. (1) will

(2) continue in 34GO-OPS-022, "Maintaining Rated Thermal Power"

D. (1) will NOT

(2) enter 34SO-N30-001-2, Main Turbine Operation, at step 7.2.2, "Shutdown on Turbine Trip"

Description: These conditions will cause a loss of Vital AC due to the alternate power being tagged out and the fuse blowing downstream of the inverter. The batteries are not available because the fuse is downstream of the inverter and the batteries are upstream. A loss of Vital AC causes a loss of feedwater heating.

A. Correct.

B. Incorrect. The batteries will not be supplying the Bus.
Plausible because the second part is correct and also if the candidate does not understand the location of the batteries in relation to the fuse and the inverter.

C. Incorrect. The batteries will not be supplying the Bus.
Plausible because the second part is correct and also if the candidate does not understand the location of the batteries in relation to the fuse and the inverter.

D. Incorrect. The Main Turbine will not trip.
Plausible because a turbine trip would occur if the backup power was not available to the Mark VI DEHC system. (normal power is Vital AC)

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure.

SYSTEM: 262002 Uninterruptable Power Supply (A.C./D.C.)

A2. Ability to (a) predict the impacts of the fol lowing on the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)

A2.01 Under voltage ..... 2.6 / 2.8

Reference(s) used to develop this question:

34AB-R25-001-2, Loss of Vital AC
34AB-N21-001-2, Loss of Feedwater Heating
R25-ELECT-LP-02705 Vital AC Lesson Plan

Reference(s) provided to the student:
None

81. 268000G2.4.21 001/2/2/RADWASTE/LEAK/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

Unit 1 is operating at 100% power.

- o Primary Containment is being vented IAW 34SO-T48-002-1, "Containment Atmospheric Control and Dilution Systems"
- o Drywell (DW) pressure is increasing at 0.12 psig/min

An operator has determined that DW UNIDENTIFIED leakage has increased to 55 gpm.

IAW ____(1)____ the required procedure action is to make ____(2)____.

A. (1) 73EP-EIP-001-0, "Emergency Classifications and Initial Actions"

(2) an Emergency Declaration based on a degraded Reactor Coolant System barrier

B. (1) 73EP-EIP-001-0, "Emergency Classifications and Initial Actions"

(2) an Emergency Declaration based on a degraded Primary Containment barrier

C. (1) 00AC-REG-001-0, REG 0024 form "Reporting Requirements"

(2) an 8 hour report to the NRC based on exceeding a Technical Specification Limit

D. (1) 00AC-REG-001-0, REG 0024 form "Reporting Requirements"

(2) a 4 hour report to the NRC based on a principal safety barrier being seriously degraded

Description: A greater than 50 GPM leak inside the drywell is a potential loss of the RCS barrier and is an Alert Emergency IAW The Fission Product Barrier Evaluation Chart of 73EP-EIP-001-0 "Emergency Classifications and Initial Actions"

A. Correct. Alert emergency due to Reactor coolant system barrier leakage >50 GPM

B. Incorrect. Drywell pressure is < 1.85 psig and no conditions exist that would require overriding the isolation signals to vent.
Plausible because of containment venting in progress. This would be a correct answer if venting required the isolation signal to be overridden.

C. Incorrect. The report would be a 1 hour report due to declaring an Alert Emergency.
Plausible because a report is required after reactor power reduction commenced when a Tech Spec shutdown is required, but it is a 4 hour report.

D. Incorrect. This a 1 hour report due to Alert Emergency
Plausible because a report is required when a principal safety barrier is seriously degraded but it is a 8 report.

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure.

SYSTEM: 268000 Radwaste

2.4 Emergency Procedures / Plan

2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.
(CFR: 41.7 / 43.5 / 45.12) IMPORTANCE RO 4.0 SRO 4.6

Reference(s) used to develop this question:
73EP-EIP-001-0, attachment 1
00AC-REG-001-0
REG-00024
REG-00025

Reference(s) provided to the student:
None

82. 290001A2.04 001/41-SC/2/SBGT RAD/BANK MOD/HIGHER/HT 2009-301/SRO/CME/ELJ/

Unit 2 was operating at 100% power when a steam line break occurred in the Main Steam Line Tunnel area.

- o The steam leak can NOT be isolated.

The following Reactor Building radiation conditions currently exist:

- o 2D11-K609A, RB POT CONTAM AREA RADIATION ..... 22 mR/hr
- o 2D11-K609B, RB POT CONTAM AREA RADIATION ..... 20 mR/hr
- o 2D11-K609C, RB POT CONTAM AREA RADIATION ..... 20 mR/hr
- o 2D11-K609D, RB POT CONTAM AREA RADIATION ..... 19 mR/hr
- o 2D21-K601F, 130' ELEVATION AREA (NORTHWEST) Tip Area .... 1100 mR/hr
- o Several other area radiation monitors in the area indicate as high as 200 mR/hr.

Which ONE of the following predicts the impact of this line break and identifies a procedure used to mitigate the consequences of this condition.

The Unit 2 Standby Gas Treatment system __(1)___ received an auto start signal.

IAW 31EO-EOP-014-2, "Secondary Containment Flowchart", the SS will direct the crew to _____(2)_____.

A. (1) has

(2) enter 34GO-OPS-13-2, "Plant Shutdown"

B. (1) has

(2) enter 34AB-C71-001-2, "Scram Procedure"

C. (1) has NOT

(2) enter 34GO-OPS-13-2, "Plant Shutdown"

D. (1) has NOT

(2) enter 34AB-C71-001-2, "Scram Procedure"

A. **Incorrect.** 34GO-OPS-13-2 is entered if two areas are above max safe radiation regardless of a leak.
Plausible because SBGT has got an auto start signal on radiation and if the candidate does not recognize that two areas are required to be above max safe radiation to perform 34GO-OPS-013-2. Also, 34GO-OPS-13-2 shutdown is in a perform concurrently step with the correct answer, but the Wait Until Step has NOT been met.

B. **Correct.** Rad levels are above the SBGT start setpoint of 18 mR/hr, a leak that cannot be isolated has occurred, and Rx bldg rad levels are above max safe in one area.

C. **Incorrect.** SBGT has an auto start signal.
Plausible if the candidate does not recognize that two areas are required to be above max safe radiation to perform 34GO-OPS-013-2. Also, 34GO-OPS-13-2 shutdown is in a perform concurrently step with the correct answer, but the Wait Until Step has NOT been met.

D. **Incorrect.** SBGT has an auto start signal.
Plausible because a scram is required with one area above max safe with a leak that cannot be isolated.

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure.

SYSTEM: 290001 Secondary Containment

A2. Ability to (a) predict the impacts of the following on the SECONDARY CONTAINMENT ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:
(CFR: 41.5 / 45.6)

A2.04 High airborne radiation ..... 3.4 / 3.7

Reference(s) used to develop this question:

31EO-EOP-014-2, "Secondary Containment Flowchart"
31EO-EOP-010-2, RPV Control (N0n-ATWS) EOP flowchart
Lesson Plan T41-SC HVAC-LP-01303, Sec Cont Ventilation System EO 037.011.A.10

Reference(s) provided to the student:
None

83. 295006G2.1.27 001/1/1/ATWS/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

Unit 1 was operating at 50% power when a scram occurs due to a loss of feedwater.

45 seconds after the Scram the following conditions exist:

- o Reactor Mode switch ..... SHUTDOWN position
- o Reactor power 10%
- o Reactor pressure ..... 1000 psig, highest since scram and stable
- o Reactor water level ..... -40 inches, lowest since scram and slowly decreasing
- o RPS White scram lights ..... "A" Channel Extinguished
- o ..... "B" Channel Illuminated
- o RPS Scram Relays ..... 1C71-K14A, C, E, and G de-energized
  ..... 1C71-K14B, D, F, and H energized
- o Full Core Display blue scram lights ... Illuminated

Which ONE of the following completes both of these statements?

The _____(1)_____ functioned properly to depressurize the Scram air header.

The Shift Supervisor will direct the crew to manually insert control rods IAW _____(2)_____.

A. (1) Alternate Rod Insertion (ARI) system

(2) 31EO-EOP-103-1, "Control Rod Insertion Methods"

B. (1) Alternate Rod Insertion (ARI) system

(2) 34AB-C11-005-1, "Control Rod Insertion Methods"

C. (1) Backup Scram Valves

(2) 31EO-EOP-103-1, "Control Rod Insertion Methods"

D. (1) Backup Scram Valves

(2) 34AB-C11-005-1, "Control Rod Insertion Methods"

A. Correct. ARI initiated due to low Rx level. The backup scram valves did not initiate due to the "B" RPS K14 relays being energized. 31EO-EOP-103-1 is used to insert rods because Rx. power is above 5%.

B. Incorrect. 31EO-EOP-103-1 is used to insert rods because Rx. power is above 5%.
Plausible because ARI did initiate and 34AB-C11-005-1 is used to insert rods when power is below 5%.

C. Incorrect. The backup scram valves did not initiate due to the "B" RPS K14 relays being energized.
Plausible if candidate does not remember RPS logic requires a full scram signal to initiate the backup scram valves or does not remember/recognize the ARI low level setpoint has been exceeded. Also plausible because 31EO-EOP-103-1 is used to insert rods in this condition.

D. Incorrect. The backup scram valves did not initiate due to the "B" RPS K14 relays being energized.
Plausible if candidate does not remember RPS logic requires a full scram signal to initiate the backup scram valves or does not remember/recognize the ARI low level setpoint has been exceeded. Also plausible if candidate does not remember the power level where 34AB-C11-005-1 is used to insert rods.

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure.

APE: 295006 SCRAM

2.1 Conduct of Operations

2.1.27 Knowledge of system purpose and/or function.
(CFR: 41.7) IMPORTANCE RO 3.9 SRO 4.0

Reference(s) used to develop this question:

31EO-EOP-011-1, RPV Control (ATWS) EOP Flowchart
34AB-C71-001-1, Scram Procedure
Lesson Plan C71-RPS-LP-01001, Reactor Protection System, EO 010.013.a.03 & a.05
Lesson Plan C11-CRD-LP-00101, Control Rod Drive System, EO 010.024.A.02

Reference(s) provided to the student:
None

84. 295008G2.4.20 001/1/2/T&P RHR CS/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

A pipe break inside the Drywell (DW) has occurred on **Unit 2.**

The following conditions exist:

- o Reactor is scrammed ..... All rods are NOT full-in
- o Reactor Power ..... 3% (highest since scram signal)
- o Reactor water level ..... 9 inches (lowest since scram signal)
- o Reactor pressure ..... 300 psig and slowly decreasing
- o DW pressure ..... 14 psig
- o Core Spray pumps ..... Manually secured

The crew sprays the DW with RHR.

- o DW pressure DECREASES to 1.0 psig and DW sprays are secured.
- o DW pressure RETURNS to 3.0 psig within 2 minutes of securing DW sprays.

Based on the above conditions the SS will order the crew to enter ___(1)___ and ___(2)___.

A. (1) 31EO-EOP-113-2, "Terminating and Preventing Injection into the RPV",

(2) secure BOTH the Core Spray and RHR pumps

B. (1) 34SO-E11-010-2, "RHR System",

(2) re-initiate DW sprays

C. (1) 31EO-EOP-114-2, "Preventing Injection into the RPV",

(2) secure the Core Spray pumps

D. (1) 34SO-E21-001-2, "Core Spray System",

(2) start the Core Spray pumps

A. Incorrect. Rx power is 3%. The override has not been met for lowering Rx. level.
Plausible because an ATWS exist and these actions are required for an ATWS >5%.

B. Incorrect. The conditions are not met to re-initiate DW sprays.
Plausible if the candidate does not understand that all conditions must be met again to re-initiate drywell sprays.

C. Correct. Note 1 on RCA chart requires 31EO-EOP-114-2 if core spray is not required for ACC. Also a caution in EOP-114 states that the Core Spray pumps will re-start on subsequent LOCA signals such as the action taken in the Stem for drywell pressure to prevent uncontrolled injection which will result in a high reactor water level in addition to a potential power excursion .

D. Incorrect. Core spray re-started on the high drywell pressure signal following DW sprays.
Plausible if the candidate does not realize that the Core Spray pumps re-start (assumes LOCA logic seal in similar to RHR) and thinks that CS can be used to inject to the RPV to restore level as RPV level decreases in this condition. (The RHR pumps do not re-start.) Core spray can be used on the RCA flowchart if table 13 systems can't maintain RWL.

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure.

APE: 295008 High Reactor Water Level

2.4 Emergency Procedures / Plan

2.4.20 Knowledge of the operational implications of EOP warnings, cautions, and notes.
(CFR: 41.10 / 43.5 / 45.13) IMPORTANCE RO 3.8 SRO 4.3

Reference(s) used to develop this question:

31EO-EOP-017-1, ATWS Level Control
31EO-EOP-114-2, Preventing Injection into the RPV from Core Spray and LPCI
Lesson Plan E21-CS-LP-00801, Core Spray System, EO 008.004.a.02

Reference(s) provided to the student:
None

85. 295014G2.2.40 001/1/2/BPWS TS/BANK MOD/HIGHER/HT 2009-301/SRO/CME/ELJ/

Unit 2 is starting up.

- o Reactor power ..... 8%.
- o Control rod withdrawal is in progress.
- o CRD drive water pressure is raised to 350 psid to move a stuck rod and is NOT restored to normal.

When the rod movement control switch is placed in the "out notch" position for the next control rod, the rod double notches from position 16 to 20. (The Group withdraw limit is 18)

The "**RMCS/RWM ROD BLOCK OR SYSTEM TROUBLE** "(603-239) annunciator is received.

The Rod Worth Minimizer is ___(1)___.

A Tech Spec Required Action Statement (RAS) for Tech Spec 3.1.6, Rod Pattern Control, is ___(2)___

A. (1) inoperable

(2) NOT required to be entered. Tech Spec compliance for the banked position withdrawal sequence (BPWS) is met.

B. (1) inoperable

(2) required to be entered due to non-compliance with the banked position withdrawal sequence (BPWS).

C. (1) operable

(2) NOT required to be entered. Tech Spec compliance for the banked position withdrawal sequence (BPWS) is met.

D. (1) operable

(2) required to be entered due to non-compliance with the banked position withdrawal sequence (BPWS).

A. Incorrect. RWM is operable and TS 3.1.6 is required to be operable.
Plausible because the rod did go beyond the notch that is normally allowed by RWM and if candidate does not remember that TS Bases specifically states that a double notch can be a BPWS problem or does not recognize the power level that the BPWS is required.

B. Incorrect. RWM is operable .
Plausible because and TS 3.1.6 is required to be operable and the rod did go beyond the notch that is normally allowed by RWM

C. Incorrect. 3.1.6 is required to be entered.
Plausible if candidate does not remember that TS Bases specifically states that a double notch can be a BPWS problem or does not recognize the power level that the BPWS is required.

D. Correct. <10% power, rod double notched beyond BPWS group limit

SRO only because this question is tied to tech spec 10CFR55.43 (2)

APE: 295014 Inadvertent Reactivity Addition

2.2 Equipment Control

2.2.40 Ability to apply Technical Specifications for a system.
(CFR: 41.10 / 43.2 / 43.5 / 45.3) IMPORTANCE RO 3.4 SRO 4.7

Reference(s) used to develop this question:

Tech Spec 3.1.6, Rod Pattern Control
Tech Spec Bases B3.1.6, Rod Pattern Control
Lesson Plan C11-RWM-LP-05403, Rod Worth Minimizer, EO 300.006.A.09

Reference(s) provided to the student:
None

86. 295017AA2.01 001/1/2/OFFSITE RELEASE/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

Unit 1 was at 80% power when a Main Steam Line break that could NOT be isolated occurred in the Turbine Building.

The following conditions currently exist:

- o Prompt Offsite Dose results ..... 1050 mR/HR peak TEDE
- o Fuel element failure ..... Confirmed
- o Reactor power: ..... All Rods Full-In
- o Reactor pressure: ..... 900 psig
- o Reactor Water Level: ..... 35 inches

IAW with 31EO-EOP-014-1, "Radioactivity Release Control" EOP flowchart, the crew __(1)__ required to emergency depressurize the reactor.

IAW 73EP-EIP-001-0, "Emergency Classification and Initial Actions", the crew __(2)__ required to declare a General Emergency.

A. (1) is

(2) is

B. (1) is

(2) is NOT

C. (1) is NOT

(2) is

D. (1) is NOT

(2) is NOT

A. Correct, At 1000 mR/hr the RR chart directs scramming and emergency depressing the reactor. EAL RG1 of 73EP-EIP-001-0 requires a General Emergency to be declared. It is Only a Site Area Emergency on the Fission Product Barrier Chart.

B. Incorrect. Declaring General Emergency is required.
Plausible since it also meets the requirement of a Site Area Emergency (100 mR/hr) or two barriers degraded.

C. Incorrect An Emergency depress is required per the RR EOP flowchart.
Plausible if the candidate does not recognize the Wait Until box on the RR chart has been met.

D. Incorrect An Emergency depress is required per the RR EOP flowchart. .
Plausible if the candidate does not recognize the Wait Until box on the RR chart has been met and since it also meets the requirement of a Site Area Emergency (100 mR/hr) or two barriers degraded.

APE: 295017 High Off-Site Release Rate

AA2. Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE : (CFR: 41.10 / 43.5 / 45.13)

AA2.01 †Off-site release rate: Plant-Specific..... 2.9* / 4.2*

Reference(s) used to develop this question:

73EP-EIP-001-0, "Emergency Classification and Initial Actions" RG1 of Attachment 2, "Hot" Initiating Condition Matrix Evaluation Chart
31EO-EOP-014-1, "Radioactivity Release Control" EOP flowchart
EOP-SCRR-LP-20325, "SCC Cont Radioactivity Release Control" EO 201.082.a.10

Reference(s) provided to the student:
None

87. 295021AA2.03 001/1/1/RHR SDC/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

Unit 1 is in Hot Shutdown.

The following conditions exist:

- o "1B" Residual Heat Removal (RHR) aligned for Shutdown Cooling.
- o "1B" RHR loop flow ..... 7,700 gpm
- o Reactor Coolant temperature ..... 220°F
- o Reactor Water Level ..... +37 inches
- o Both Reactor Recirculation Pumps are secured

An electrical fault causes 1E11-F009, "SDC Suction VLV" to fail CLOSED.

- o 1E11-F009 can NOT be re-opened.

Which ONE of the following answers both of these statements?

Reactor water level __(1)__ adequate to ensure there is a flow path available for reactor coolant natural circulation.

The Shift Supervisor will direct performance of _____(2)_____.

A. (1) is

(2) 50AC-MNT-001-0, "Maintenance Program" section 8.1.7, "Emergency Maintenance"

B. (1) is NOT

(2) 34SO-E11-010-1, "RHR System" section 7.4.2, "Shifting Shutdown Cooling Loops"

C. (1) is NOT

(2) 34SO-B31-001-1, "Reactor Recirculation System" section 7.1.2, "Recirc pump A(B) Startup"

D. (1) is

(2) 34GO-OPS-013-1, "Plant Shutdown" Attachment 1, Cooldown/Depressurization Check", every 15 minutes

Description: When 1E11-F009 fails closed the RHR pump will trip due to suction valve interlocks. 37" is normal reactor water level. With no forced circulation and RWL <53" a coolant flow path for natural circulation is not available. Tech Specs requires a re-start of SDC or a recirc pump.
Certain RHR suction valves (2E11-F004, F006, F008 and F009) have interlocks which cause a RHR pump trip when the valve is closed. Suction valve 2E11-F065 is not interlocked with the pump. The F008 and F009 are in series and both are required to be open for a suction path for SDC.

A. Incorrect, RWL is <53" and no forced circulation exist. (see above)
Plausible because RWL is in the normal band. Also because Emergency Maintenance would be used for this condition.

B. Incorrect, the "A" RHR SDC Loop cannot be started due to the F009 being closed.
Plausible because this is an action in the Loss of SDC Abnormal procedure and if the candidate does not remember that the F008 and F009 are in series.

C. Correct, see above

D. Incorrect, RWL is <53" and no forced circulation exist. (see above)
Plausible because RWL is in the normal RWL band and also because plotting temperature is required by 34GO-OPS-013-1, "Plant Shutdown" Attachment 1, Cooldown/Depressurization Check", is required to be increased to every 15 minutes.

APE: 295021 Loss of Shutdown Cooling

AA2. Ability to determine and/or interpret the following as they apply to LOSS OF SHUTDOWN COOLING : (CFR: 41.10 / 43.5 / 45.13)

AA2.03 Reactor water level 3.5 3.5

Reference(s) used to develop this question:
50AC-MNT-001-0, "Maintenance Program"
34GO-OPS-013-1, "Plant Shutdown"
34SO-B31-001-1, "Reactor Recirculation System"
34AB-E11-001-1, "Loss of SDC"
TS 3.4.7 RHR SDC section for Hot Shutdown conditions
E11-RHR-LP-00701 "RHR System" lesson plan EO 200.049.A.01 and EO 007.005.A.04

Reference(s) provided to the student:
None

88. 295023G2.4.45 001/1/1/REFUEL ACCIDENT/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

Unit 2 is in Mode 5, with irradiated fuel movement in progress. The Fuel Handling SRO contacts the Control Room to report that a fuel bundle has fallen from the grapple. The bundle fell approximately four feet, but landed in it's correct in-core location. Visible gas bubbles are coming from the bundle.

One minute later the Control Room receives the following annunciators:

- **REFUELING FLOOR VENT EXHAUST RADIATION HIGH** (601-409-2)
- **REFUELING FLOOR VENT EXHAUST RADIATION HI-HI** (601-403-2)
- **REFUELING FLOOR AREA RADIATION HIGH** (601-312-2)

Which ONE of the following describes the HIGHEST priority action that is required to be taken and the procedure that is required to be entered IAW 31EO-EOP-014-2, "Secondary Containment Control" (SC chart)?

A. Contact Health Physics to confirm local radiation conditions.

Enter procedure 34AB-T22-003-2, "Secondary Containment Control".

B. Evacuate the Refuel Floor.

Enter procedure 34SO-T41-006-2, "Refueling Floor Ventilation System".

C. Contact Health Physics to confirm local radiation conditions.

Enter procedure 34SO-T41-006-2, "Refueling Floor Ventilation System".

D. Evacuate the Refuel Floor.

Enter procedure 34AB-T22-003-2, "Secondary Containment Control".

A. **Incorrect.** The refuel floor should be evacuated per 34AR-601-403-2 which is a higher setpoint alarm than 34AR-601-312-2 and its' actions should be prioritized higher.
Plausible because contacting HP is a required action IAW 34AR-601-312-2, step 5.3.2 prior to evacuating and 34AB-T22-003-2 is required to be entered.

B. **Incorrect.** 34SO-T41-006-2 is not required to be entered because the RF Floor Vent Exhaust Radiation Hi-Hi alarm is annunciated. This alarms significance is that it comes on when Table 14 setpoints are exceeded which takes away the requirement to enter 34SO-T46-006-2 per the override on the EOP SC Flowchart.
Plausible because the refuel floor should be evacuated and this would be a required procedure if the RF Floor Vent Exhaust Radiation Hi-Hi alarm was not annunciated.

C. **Incorrect.** The refuel floor should be evacuated per 34AR-601-403-2 which is a higher setpoint alarm than 34AR-601-312-2 and its' actions should be prioritized higher. Also 34SO-T41-006-2 is not required to be entered because the RF Floor Vent Exhaust Radiation Hi-Hi alarm is annunciated. This alarms significance is that it comes on when Table 14 setpoints are exceeded which takes away the requirement to enter 34SO-T46-006-2 per the override on the EOP SC Flowchart.
Plausible because contacting HP is a required action IAW 34AR-601-312-2, step5.3.2 prior to evacuating and 34SO-T46-006-2 would be a required procedure if the RF Floor Vent Exhaust Radiation Hi-Hi alarm was not annunciated.

D. **Correct.** The candidate must prioritize the actions of 601-403 higher than 601-312 and recognize the significance of 601-403 and how it determines the EOP SC chart actions that are required.

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure.

APE: 295023 Refueling Accidents

2.4 Emergency Procedures / Plan

2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm.
(CFR: 41.10 / 43.5 / 45.3 / 45.12) IMPORTANCE RO 4.1 SRO 4.3

Reference(s) used to develop this question:

31EO-EOP-014-2, Secondary Containment Control (SC chart)
34AB-T22-003-2, Secondary Containment Control
34SO-T41-006-2, Refueling Floor Ventilation System
34AR-601-409-2, REFUELING FLOOR VENT EXHAUST RADIATION HIGH
34AR-601-403-2, REFUELING FLOOR VENT EXHAUST RADIATION HI-HI
34AR-601-312-2, REFUELING FLOOR AREA RADIATION HIGH
34AB-J11-001-2, Irradiated Fuel Damage During Handling

Reference(s) provided to the student:
None

89. 295026EA2.03 001/1/1/TORUS TEMP/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

Unit 2 scrammed on low reactor water level due to a loss of the Condensate system.

Current plant conditions are:

- Control rods ..... Fully inserted
- Reactor Water Level ..... -135 inches and stable
- Reactor Pressure ..... 900 psig, being controlled by LLS
- Torus Level ..... 180 inches and slowly increasing
- Torus Temperature ..... 192°F and slowly increasing

IAW the EOP flowcharts and Graph 2, the NEXT EOP action that the SS is required to direct is to _____.

A. Perform the "Override" step at co-ordinate "E3" on the RC, "RC RPV Control", EOP flowchart, to reduce pressure to 300 psig irrespective of the resulting cooldown rate.

B. enter Point "G" on the CP-1, "Alternate Level Control, Steam Cooling & Emergency RPV Depressurization", EOP flowchart, and open 7 ADS valves

C. perform the "Override" step at co-ordinate "G-1" on the RC, "RPV Control", EOP flowchart to open SRVs to reduce reactor pressure without exceeding 100°F/hr

D. perform the "Perform Concurrently" step at co-ordinate "G-5" on the PC, "Primary Containment Control", EOP Flowchart to lower torus water level

The EOPs require maintaining in the Safe Area of the HCTL graph, but if the unsafe area is entered the reactor will be emergency depressurized.

A. **Incorrect.** The reactor must be Emergency Depressed due to already being in the unsafe area of the HCTL limit curve.
Plausible because lowering pressure to 300 psig would place the plant in the Safe area of the HCTL and this would be the action required to prevent entering the Unsafe area.

B. Correct

C. **Incorrect.** The reactor must be Emergency Depressed due to already being in the unsafe area of the HCTL limit curve.
Plausible because this action would be performed if the candidate did not recognize that the the unsafe area of Graph 2 had been entered.

D. **Incorrect.** The reactor must be Emergency Depressed due to already being in the unsafe area of the HCTL limit curve.
Plausible because this action would be performed to prevent entering the unsafe area of Graph 2.

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure.

EPE: 295026 Suppression Pool High Water Temperature

EA2. Ability to determine and/or interpret the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: (CFR: 41.10 / 43.5 / 45.13)

EA2.03 Reactor pressure..... 3.9 4.0

Reference(s) used to develop this question:
31EO-EOP-011-2, "RPV Control ATWS", EOP flowchart (RCA)
31EO-EOP-015, "Alternate Level Control, Steam Cooling & Emergency RPV Depressurization", EOP flowchart (CP-1)
31EO-EOP-017-2, "ATWS Level Control", EOP flowchart (CP-3)
31EO-EOP-012-2, "Primary Containment Control" EOP Flowchart (PCC)
EOP Graph 2, "Heat Capacity Temperature Limit"
EOP-CP3-LP-20327, "Level Power Control" Lesson Plan EO 201.091.A.01

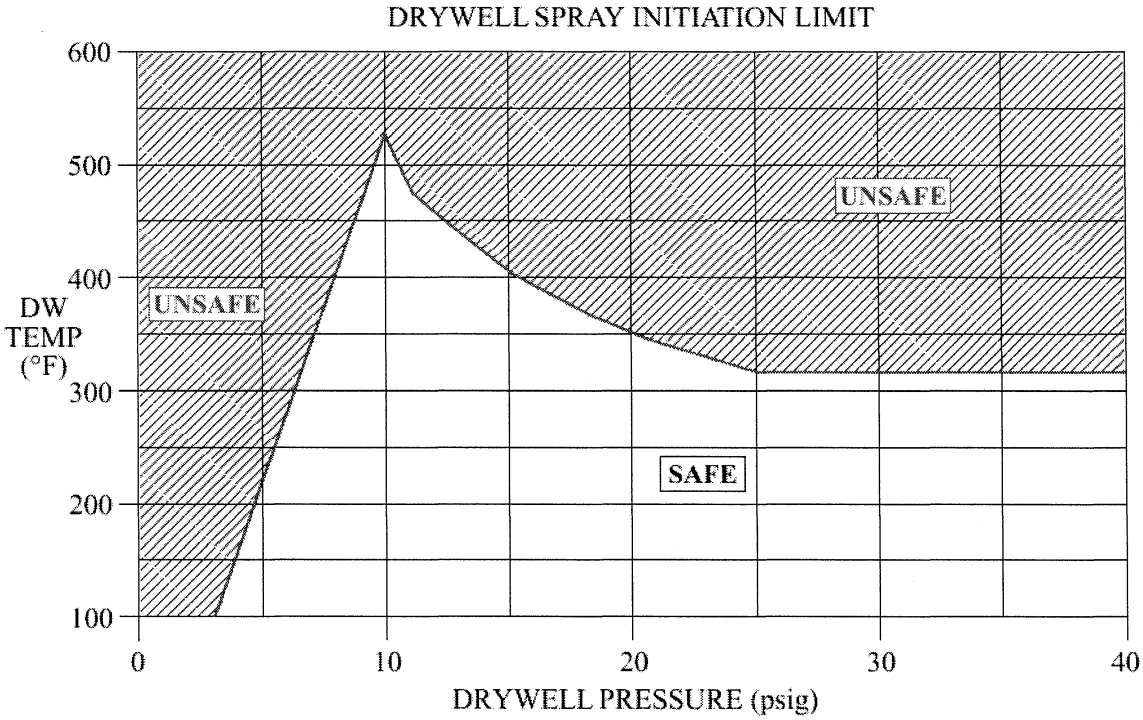
Reference(s) provided to the student:
None

90. 295028EA2.04 001/1/1/DW SPRAY/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

A small break Loss Of Coolant Accident (LOCA) has occurred on **Unit 2**.

The following conditions exist:

- o Control Rods ..... All Rods In
- o Reactor Water Level ..... 9 inches / stable
- o Torus Level ..... 150 inches / slowly increasing
- o Drywell pressure ..... 4 psig / slowly increasing
- o Bulk Average Drywell temperature ... 270°F / slowly increasing



The SS will order an operator to enter procedure ____(1)____ and ____(2)____.

A. (1) 31EO-EOP-100-2, "Miscellaneous Emergency Overrides"
(2) override the LOCA signal to the drywell cooling fans

B. (1) 31EO-EOP-100-2, "Miscellaneous Emergency Overrides"
(2) override the LOCA signal to the drywell chillers

C. (1) Enter 34SO-E11-010-2, "RHR System"
(2) initiate RHR in the Drywell Spray mode

D. (1) Enter 34SO-E11-010-2, "RHR System"
(2) initiate RHR in the Torus Spray mode

A. **Incorrect.** Drywell average bulk temperature is above 250°F with a LOCA. This is not allowed by a caution in 31EO-EOP-100-2.
Plausible because the EOP PC chart at C 1 directs performing the action. This would be a correct action if DW temperature was below 250F or if a line break did not exist. Also starting DW cooling fans is a required action on PCG chart.

B. **Incorrect.** Drywell avg. bulk temp. is above 250°F with a LOCA. This is not allowed by a Caution in 31EO-EOP-100-2.
Plausible because the EOP PC chart at C 1 directs performing the action. This would be a correct action if DW temperature was below 250F or if a line break did not exist.

C. **Incorrect.** When the candidate plots the current plant conditions on the DSIL graph, it should be determined that the plant is in the Unsafe area of the graph for drywell sprays.
Plausible because if the candidate does not or incorrectly plots the plant parameters on the DSIL Graph, then drywell spray would be allowed as directed by the PC flowchart at E 6.

D. **Correct.**

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure.

EPE: 295028 High Drywell Temperature

EA2. Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE : (CFR: 41.10 / 43.5 / 45.13)

EA2.04 Drywell pressure..... 4.1 4.2

Reference(s) used to develop this question:

31EO-EOP-012-02, Primary Containment Control" EOP Flowchart (PCC)
31EO-EOP-100-2, "Miscellaneous Emergency Overrides"
EOP-CURVES-LP-2306, "Curves and Limits" lesson plan, 201.072.A.29

Reference(s) provided to the student:
None

91. 295038G2.4.9 001/1/1/RELEASE/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

Unit 1 just entered Mode 5 in preparation for a Refueling Outage.

- o Boil Off time as calculated from Attachment 2, Vessel and Cavity Boil Off Time, of 34AB-E11-001-1, "Loss of Shutdown Cooling" has been exceeded during a loss of Shutdown Cooling.
- o Secondary Containment is NOT intact.
- o A radiation release is occurring and can NOT be terminated.
- o A General Emergency has been declared.
- o 73EP-EIP-018-0, "Prompt Offsite Dose Assessment", indicates that the following CDE values exist:
  - o 1 mile is 6 REM Thyroid
  - o 10 miles is 1 REM Thyroid

IAW NMP-EP-109, Protective Action Recommendations, the Emergency Director will issue _____.

Reference Provided

A. PAR 1

B. PAR 2

C. PAR 3

D. PAR 4

A. Incorrect. PAR 3 is correct

Plausible because the candidate must follow the flowchart for the conditions present and if not followed correctly this PAR could be entered.

B. Incorrect. PAR 3 is correct

Plausible because the candidate must follow the flowchart for the conditions present and if not followed correctly this PAR could be entered.

C. Correct.

D. Incorrect. PAR 3 is correct

Plausible because the candidate must follow the flowchart for the conditions present and if not followed correctly this PAR could be entered.

Provide candidate with NMP-EP-109, Protective Action Recommendations, Attachment 1 ONLY

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate sections of a procedure.

EPE: 295038 High Off-Site Release Rate

2.4 Emergency Procedures / Plan

2.4.9 Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.
(CFR: 41.10 / 43.5 / 45.13) IMPORTANCE RO 3.8 SRO 4.2

Reference(s) used to develop this question:
NMP-EP-109, "Protective Action Recommendations"
EP-LP-20102, "Protective Actions" EO 001.008.A.01

Reference(s) provided to the student:
NMP-EP-109, Protective Action Recommendations, Attachment 1 ONLY

92. 300000A2.01 001/2/1/SSAC DRYER/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

Unit 2 is at 10% power during a Reactor startup.

- o Station Service Instrument Air Dryer After Filter, 2P52-D102A, is tagged out of service
- o Annunciator INSTR AIR AFT FLTR D102B DIFF PRESS HIGH (700-214-2) alarms
- o Air pressure down stream of the After Filters begins to decrease

Which ONE of the following completes BOTH of these statements?

With NO operator action, entry into ___(1)___ will be required as a result of air pressure decreasing to ___(2)___ (select the HIGHEST air pressure that applies).

A. (1) 34AB-C32-001-2, "RWL Above 60 Inches"

(2) 80 psig

B. (1) 34AR-603-123-2, "REACTOR LEVEL CONTROL VALVE LOCKED"

(2) 80 psig

C. (1) 34AB-C32-001-2, "RWL Above 60 Inches"

(2) 50 psig

D. (1) 34AR-603-123-2, "REACTOR LEVEL CONTROL VALVE LOCKED"

(2) 50 psig

Description: When the after filter clogs, it will cause air pressure to start decreasing and will not be restored until maintenance is performed. As air pressure continues to decrease the 2P52-F565 valve will open to provide nitrogen to the non-interruptible essential instrument air header. The Startup Level Control valve will lock-up at its current position when air pressure decreases below 50 psig. The position will most likely be in mid-position since it is being used for RWL control under these plant conditions.

80 psig is the opening pressure for 2P52-F565 (Nitrogen Backup).

A. Incorrect; The Startup Level Control valve fails as is at 50 psig (not full open).
Plausible if the candidate assumes the Startup Level Control Valve fails OPEN on a loss of air, since this would allow an uncontrolled floodup of the RPV. 80 psig corresponds to automatic opening of 2P52-F565.

B. Incorrect; The Startup Level Control valve fails as is at 50 psig..
Plausible if the candidate thinks the Startup Level Control Valve fails as-is at 80 psig. 80 psig corresponds to automatic opening of 2P52-F565.

C. Incorrect; The Startup Level Control valve fails as is at 50 psig (not full open).
Plausible if the candidate assumes the Startup Level Control Valve fails open on a loss of air, since this would allow an uncontrolled floodup of the RPV.

D. Correct, see above.
SYSTEM: 300000 Instrument Air System (IAS)

A2. Ability to (a) predict the impacts of the following on the INSTRUMENT AIR SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: (CFR: 41.5 / 45.6)

A2.01 Air dryer and filter malfunctions 2.9 2.8

Reference(s) used to develop this question:

34AB-P51-001-2, "Loss of Instrument and Service Air System or Water Intrusion Into The Service Air System"
P51-P52-P70-Plant Air-LP-03501, "Plant Air System" lesson plan EO 200.025.A.01
INSTR AIR AFT FLTR D102B DIFF PRESS HIGH (700-214-2) Annunciator

Reference(s) provided to the student:
None

93. 600000G2.4.49 001/1/1/FIRE TS/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

Unit 1 is operating at 100% power.

- o A fuel oil fire ignites in the "1A" Emergency Diesel Generator (EDG) room.

The red light associated with the fire protection system, in the hall next to "1A" EDG room door, is EXTINGUISHED.

- o CO_2 is NOT being discharged into the "1A" EDG Room.

IAW 34SO-X43-005-0, "Diesel Generator Building Carbon Dioxide System", the action(s) that must be taken INSIDE the EDG building to manually actuate the "1A" EDG CO_2 system is to _____(1)_____, then immediately exit the area.

- o After the fire is extinguished, the "1A" EDG is declared inoperable.
- o Fire damage was confined to the "1A" EDG room.

IAW Tech Specs, the Tech Spec loads supplied from the emergency bus associated with the "1A" EDG _____(2)_____.

A. (1) depress and hold the START pushbutton

(2) remain operable

B. (1) depress and hold the START pushbutton

(2) are required to be declared inoperable

C. (1) place the Diesel Generator Room CARDOX Pilot Control Valve in the OPEN position.

(2) remain operable

D. (1) place the Diesel Generator Room CARDOX Pilot Control Valve in the OPEN position.

(2) are required to be declared inoperable

This questions is based on 34AB-X43-001-1, Fire Procedure (abnormal). This procedure lists automatic actions including "Fire Suppression Initiation" (34AB-X43-001-1, Fire Procedure). In this case the fire suppression system fails to automatically initiate. A problem is indicated by the extinguished Red ready light.

30AC-OPS-001-0, Plant Operations, step 8.5.4.1.6 requires that operators manually align any automatically actuated system equipment, signal, or function that has indication of a start failure or incomplete initiation so that it wll perform its intended function unless operation would create a condition that would not mitigate a transient. This step is instruction for the operator to manually initiate the fire suppression system which has failed to automatically actuate.

The direction for actuating the EDG bldg CARDOX system in found in 34SO-X43-005-0, "Diesel Generator Building Carbon Dioxide System" which states:

Step 7.2.1 If the "Red" ready light is illuminated, then depress and hold appropriate start pushbutton switch until the red light is extinguished and immediately exit the area.

Step 7.2.2 If the red ready light was not illuminated or if CO2 discharge does not occur, then place in open applicable Diesel Generator Room CARDOX Pilot Control Valve.

A. 1st part - Incorrect since the red light was not illuminated (See preceding statement).
Plausible since the candidate must know the significance of the red light associated with the fire suppression system and then understand the correct action based on the light indication.
2nd part - Correct

B. 1st part - Incorrect since the red light was not illuminated (See preceding statement)
Plausible since the candidate must know the significance of the red light associated with the fire suppression system and then understand the correct action based on the light indication.
2nd part - Incorrect. No TS requirement to declare the components inoperable in this instance.
Plausible since TS does require emergency power available for operability and components are to be declared inoperable if redundant components are inoperable. Example, CS "1B" inop requires redundant ECCS systems to be declared inoperable after the "1A" EDG has been inoperable for 4 hrs. (TS 3.8.1.B.2)

C. 1st Part - **Correct**
2nd part - **Correct**

D. 1st part - **Correct**
2nd part - **Incorrect**. No TS requirement to declare the components inoperable in this case.
Plausible since TS does require emergency power available for operability and components are to be declared inoperable if redundant components are inoperable. Example, CS "1B" inop requires redundant ECCS systems to be declared inoperable after the "1A" EDG has been inoperable for 4 hrs. (TS 3.8.1.B.2)

APE: 600000 Plant Fire On Site

2.4 Emergency Procedures / Plan

2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.
(CFR: 41.10 / 43.2 / 45.6) IMPORTANCE RO 4.6 SRO 4.4

Reference(s) used to develop this question:

Unit 1 TS and TS Bases
34SO-X43-005-0, "Diesel Generator Building Carbon Dioxide System"
X43-FPS-LP-03601, "Fire Protection System" EO 200.024.A.03

Reference(s) provided to the student:
None

94. G2.1.20 001/3/1/LOCKOUT RESET/BANK MOD/HIGHER/HT 2009-301/SRO/CME/ELJ/

Both **Unit 1** Reactor Recirculation pumps have tripped as a result of a reactor water level transient.

- The operator has been directed to restart Reactor Recirculation pumps.

IAW procedure _____(1)_____, the MINIMUM required authorization for resetting the Reactor Recirculation pump MG set lockout relays is the _____(2)_____.

A. (1) 31GO-OPS-021, Manipulation of Controls and Equipment

(2) Shift Supervisor AND Electrical Team Leader

B. (1) 30AC-OPS-003, Plant Operations

(2) Shift Supervisor AND Electrical Team Leader

C. (1) 31GO-OPS-021, Manipulation of Controls and Equipment

(2) Shift Supervisor ONLY

D. (1) 30AC-OPS-003, Plant Operations

(2) Shift Supervisor ONLY

31GO-OPS-021, Manipulation of Controls and Equipment, specifies that The Recirculation Pump MG Set Lock-out Relays may be reset as authorized by the SS provided the trip cause has been investigated and considered NOT to be detrimental to the equipment. This is the basis for the correct answer.

Lock-out relays and flags on protective relays that trip lock-out relays will NOT be reset UNTIL authorized by the SS and one of the following:

- Shift Manager (SM) or higher
- Engineering Supervisor or higher
- Maintenance Team Leader (TL) (Supervisor)(Electrical) or higher

A. 1st part is **Correct.** Second part is incorrect as noted above

Plausible because previous step in procedure requires SS approval and Electrical Team leader

B. First part is incorrect because this procedure does not specify lockout reset authority,

Plausible because this information was previously contained in this procedure and is under the category of Conduct of Operations.

See reason in A for second part

C. Correct..

D. 1st part is incorrect. See above

2nd part is **incorrect**. See above

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate sections of a procedure.

2.1 Conduct of Operations

2.1.20 Ability to interpret and execute procedure steps.
(CFR: 41.10 / 43.5 / 45.12) IMPORTANCE RO 4.6 SRO 4.6

Reference(s) used to develop this question:
31GO-OPS-021, Manipulation of Controls and Equipment
B31-RRS-LP-00401, Reactor Recirculation System, EO 004.001.01

Reference(s) provided to the student:
None

95. G2.2.11 001/3/2/TEMP MOD/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

Which ONE of the following completes both of these statements?

_____(1)_____ requires that a Temporary Modification tag be hung IAW "Temporary Modification Control", 40AC-ENG-018-0.

A Plant Review Board approval ___(2)___ required.

A. (1) Pulling the annunciator card for "CORE SPRAY SYSTEM II ACTUATED", 601-101-2 to disable the alarm

(2) is

B. (1) Pulling the annunciator card for "CORE SPRAY SYSTEM II ACTUATED", 601-101-2 to disable the alarm

(2) is NOT

C. (1) Changing the Unit 2 HPCI oil filter from a standard cartridge oil filter to a water scavenging oil filter for one week to remove moisture from the lube oil

(2) is

D. (1) Changing the Unit 2 HPCI oil filter from a standard cartridge oil filter to a water scavenging oil filter for one week to remove moisture from the lube oil

(2) is NOT

A. Incorrect, does not require temporary modification documentation or approvals.

Plausible since it is a change to a plant system.

B. Incorrect, does not require temporary modification documentation or approvals.

Plausible since it is a change to a plant system.

C. Correct

D. Incorrect, Plant Review Board approval is required.
Plausible since it is a change to a plant system and other plant system changes such as annunciator card pulling does not require PRB approval.

2.2 Equipment Control

2.2.11 Knowledge of the process for controlling temporary design changes .
(CFR: 41.10 / 43.3 / 45.13) IMPORTANCE RO 2.3 SRO 3.3

Reference(s) used to develop this question:

40AC-ENG-018-0, "Temporary Modification Control"
LT-LP-30004, "Administrative Procedures" lesson plan EO LT-300.017.A.02
NMP-GM-009, Plant Review Board Charter (definition of Safety Related)

Reference(s) provided to the student:
None

96. G2.2.7 001/3/2/IPTE/NEW/FUND/HT 2009-301/SRO/CME/ELJ/

Unit 1 is in a refueling outage.

Integrated Leak Rate Testing (ILRT) is planned IAW "Primary Containment Integrated Leakage Rate Test", 42SV-TET-003-1.

IAW NMP-AD-006, "Infrequently Performed Tests and Evolutions" (IPTE), the lowest level of authority that is allowed to conduct the IPTE brief for this testing is a __(1)__.

The person conducting the IPTE brief __(2)__ have a direct role in the ILRT being performed.

A. (1) Shift Supervisor

(2) can

B. (1) Shift Supervisor

(2) can NOT

C. (1) Shift Manager

(2) can

D. (1) Shift Manager

(2) can NOT

A. Incorrect. A minimum of Shift Manager level is required and the person performing the IPTE brief can have a direct role in the task.
Plausible because a Shift Supervisor routinely performs pre-job briefs. Also persons leading a brief generally have a direct role in the task.

B. Incorrect. A minimum of Shift Manager level is required.
Plausible because a Shift Supervisor routinely performs pre-job briefs.

C. Incorrect. A person performing an IPTE can not have a direct role in the task.
Plausible because a person leading a pre-job brief routinely has a direct role in the task.

D. Correct

2.2 Equipment Control

2.2.7 Knowledge of the process for conducting special or infrequent tests.
(CFR: 41.10 / 43.3 / 45.13) IMPORTANCE RO 2.9 SRO 3.6

Reference(s) used to develop this question:

NMP-AD-006, "Infrequently Performed Tests and Evolutions"
LT-LP-30007 "Shift Operations and Evolutions" TO 560.003.B
SOER 91-01, "Infrequently Performed Tests or Evolutions"

Reference(s) provided to the student:
None

97. G2.3.11 001/3/3/DW EMERGENCY VENT/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

A major Loss of Coolant Accident (LOCA) has occurred on **Unit 2**.

The following conditions currently exist:

- o Drywell Pressure ..... 54 psig, slowly increasing
- o Torus Pressure ..... 52 psig, slowly increasing
- o Drywell Radiation ..... 2500 R/Hr, slowly increasing
- o Reactor water level ..... -165 inches, stable
- o Wide Range Torus Water Level ..... OFFSCALE High (300 inches indicated)

Which ONE of the following identifies the method for controlling Primary Containment pressure?

IAW 31EO-EOP-012-2, "Primary Containment Control" and 31EO-EOP-101-2, "Emergency Containment Venting", the Shift Supervisor will order the crew to Emergency Vent the _____.

A. Drywell until containment pressure is below 1.85 psig

B. Suppression Chamber until containment pressure is below 1.85 psig

C. Drywell ONLY as necessary to maintain containment pressure below 56 psig

D. Suppression Chamber ONLY as necessary to maintain containment pressure below 56 psig

Description: When emergency venting the containment you would normally want to vent from the torus, but in this case torus level is too high. The EOPs do not allow venting the torus if torus level is above 300", the upper limit of the instrumentation. Also normally when venting is performed, pressure is decreased until it is slightly above 0 psig, but in this case venting is only performed as necessary to protect the containment (maintained below 56 psig but not lowered significantly), but at the same time limiting the radiation release to the public.

A. Incorrect. Drywell pressure should only be decreased to a point to prevent containment failure, while limiting the release to the public IAW 31EO-EOP-101-2.
Plausible because this is the pressure that the Drywell is normally vented to per the EOP PC flowchart (non-Emergency Venting).

B. Incorrect. Torus level is too high to vent the suppression (>300").
Plausible because per the EOP PC flowchart the suppression chamber is the preferred vent path. If venting the Suppression Chamber were allowed, this is the pressure the containment is normally vented to per the EOP PC flowchart (non-Emergency Venting)

C. Correct

D. Incorrect. Torus level is too high to vent the Suppression Chamber (>300").
Plausible because this is the correct direction for controlling pressure IAW with 31EO-EOP-101-2 and Suppression Chamber venting is the preferred method for venting.

2.3 Radiation Control

2.3.11 Ability to control radiation releases.
(CFR: 41.11 / 43.4 / 45.10) IMPORTANCE RO 3.8 SRO 4.3

Reference(s) used to develop this question:
31EO-EOP-101-2, "Emergency Containment Venting"
31EO-EOP-012-2, "Primary Containment Control"
EOP-101-LP-20312, "Emergency Containment Venting" EO 013.054.A.07
EOP-PC-LP-20310, "Primary Containment Control" EO 201.072.A.07

Reference(s) provided to the student:
None

98. G2.3.5 001/3/3/RAD EVENT/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

A small steam leak in the **Unit 2** RCIC room occurs.

- o The time is 10:00 A.M.
- o Area Radiation Monitor (ARM) 2D21-K601G, "RB 130' N-E Working Area" begins increasing at a constant 60 mR/Hr
- o NORMAL dose rate in this area: 2 mR/Hr

IAW 73EP-RAD-001-0, "Radiological Event", the EARLIEST time that the criteria for declaring a Radiological Event is at ___(1)___.

The LOWEST level of authority that can declare the Radiological Event is the ___(2)___.

A. (1) 10:18 A.M.

(2) Shift Manager

B. (1) 10:18 A.M.

(2) Shift Supervisor

C. (1) 10:48 A.M.

(2) Shift Manager

D. (1) 10:48 A.M

(2) Shift Supervisor

73EP-RAD-001-0 states that the SS is the minimum level of qualification to declare a Rad Event. The event should be declared (in consultation with HP) when rad levels are 10 times normal. 10:18 would put the rad level at 20 mR/hr, which is 10 times normal. At 10:48 rad levels would be 50 mR/hr, which is the Max Normal Rad level for the area per the EOP SC flowchart.

A. **Incorrect,** the procedure states the Control Room Shift Supervisor is the minimum level of qualification necessary.
Plausible as the SS does not normally declare "events". Also the time is correct.

B. **Correct.**

C. **Incorrect,** the procedure states the Control Room Shift Supervisor is the minimum level of qualification necessary. Also the time is incorrect.
Plausible as the SS does not normally declare "events" and 50mR/hr is the Max Normal Operating Rad level for the area.

D. **Incorrect,** the time is incorrect.
Plausible as 50mR/hr is the Max Normal Operating Rad level for the area.

SRO Because CFR 43.4 Radiation hazards that may arise ...

2.3 Radiation Control

2.3.5 Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.
(CFR: 41.11 / 41.12 / 43.4 / 45.9) IMPORTANCE RO 2.9 SRO 2.9

Reference(s) used to develop this question:

73EP-RAD-001-0, "Radiological Event"
LT-LP-30001, "Offsite Dose Calculation Manual" TO 200.051.A

Reference(s) provided to the student:
None

99. G2.4.22 001/3/4/SCC RCIC TIMER/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

Unit 1 was operating at 100% power when a transient resulted in a full reactor scram signal.

Conditions are as follows:

- o Several control rods remain fully withdrawn
- o Reactor power 10%
- o Reactor pressure ..... 960 psig and steady
- o Reactor water level .... -70 inches and steady

- o Injection of Sodium Pentaborate using Reactor Cooling Isolation Cooling (RCIC) is the only method available to add negative reactivity to the core.

A report is received in the control room that there is a small RCIC steam line leak discharging steam into the Secondary Containment (SC).

- o The "RCIC ISOL TIMER INITIATED (602-303-1) annunciator is received
- o The SC area temperatures are below Maximum Safe Operating Temperatures

IAW the SC Control flowchart, the Shift Supervisor will direct the crew to _____(1)_____.

The bases of this direction is _____(2)_____.

A. (1) isolate RCIC

(2) to allow personnel to enter Secondary Containment to operate Safe Shutdown equipment

B. (1) isolate RCIC

(2) to protect other Safe Shutdown equipment located in Secondary Containment

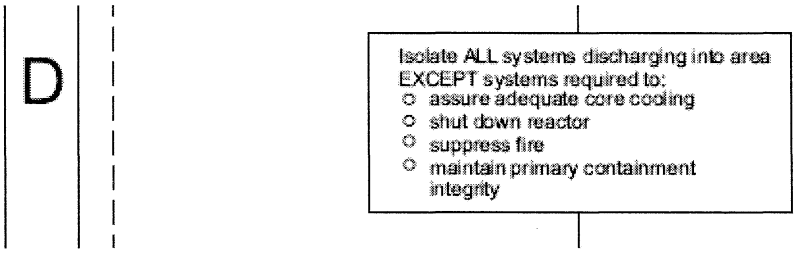
C. (1) allow RCIC operation to continue

(2) that RCIC is required to shut down the reactor

D. (1) allow RCIC operation to continue

(2) that RCIC is required to assure adequate core cooling

From the EOP SC Flowchart Temp path



A. Incorrect. RCIC should not be isolated. It is being used to inject Boron to shutdown the Rx.
Plausible because if RCIC was not being used to inject boron, it would be required to be isolated. Also because this is one of the bases for the EOP Max Safe temps.

B. Incorrect. RCIC should not be isolated. It is being used to inject Boron to shutdown the Rx.
Plausible because if RCIC was not being used to inject boron, it would be required to be isolated. Also because this is one of the bases for the EOP Max Safe temps.

C. Correct, RCIC operation should be continued and is a higher priority than protecting secondary containment IAW the EOP SC flowchart step above, to shutdown the reactor.

D. Incorrect. With these plant conditions, RCIC is not required for ACC. The Rx could be depressed and low pressure ECCS could be used for ACC.
Plausible because RWL is below the automatic start setpoint for RCIC injection on low RWL.

2.4 Emergency Procedures / Plan

2.4.22 Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.
(CFR: 41.7 / 41.10 / 43.5 / 45.12) IMPORTANCE RO 3.6 SRO 4.4

Reference(s) used to develop this question:

31EO-EOP-014-1, "Secondary Containment Control/Radioactivity Release Control" EOP Flowchart
EOP-SCRR-LP-20325, "Secondary Containment Control/ Radioactivity Release Control"
EO 201.077.A.06 and EO 201.077.A.07

Reference(s) provided to the student:
None

100. G2.4.30 001/3/4/ENN ENS NOTIFICATION/NEW/HIGHER/HT 2009-301/SRO/CME/ELJ/

Unit 1 was operating at 100% power when multiple "system malfunctions" required that an Alert Emergency be declared.

- o The Alert declaration was made at 0800

Which ONE of the following identifies both the time requirements and form used to notify the Nuclear Regulatory Commission (NRC) of the plant status?

IAW with 00AC-REG-001-0, "Federal and State Reporting and Federal Document Posting Requirements", the LATEST time the team is allowed to make the NRC notification for the Alert Emergency is ___(1)___,

The form used in making this notification is the ___(2)___.

- o Emergency Notification Network (ENN)
- o Emergency Notification System (ENS)

A. (1) No later than 0815

(2) ENN form

B. (1) No later than 0815

(2) ENS form

C. (1) No later than 0900

(2) ENN form

D. (1) No later than 0900

(2) ENS form

A. **Incorrect,** the NRC notification does not have to be made until 0900 and the ENN is NOT used.
Plausible since the notification to the state and locals is a 15 minutes time limit which the candidate is familiar with, also the ENN is used during an emergency to notify state and locals.

B. **Incorrect,** the NRC notification does not have to be made until 0900.

Plausible since a 15 minute time limit is required during a declared emergency for the state and local notification. Also, the ENS form is used.

C. **Incorrect,** the ENN form is not used, but the 0900 time frame is correct.
Plausible as the ENN form is used during an emergency except it is used to notify state and locals.

D. **Correct,** the notification is required by 0900 and the ENS form is used.

2.4 Emergency Procedures / Plan

2.4.30 Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.
(CFR: 41.10 / 43.5 / 45.11) IMPORTANCE RO 2.7 SRO 4.1

Reference(s) used to develop this question:

73EP-EIP-004-0, "Duties of Emergency Director"
REG-0024 Reporting Requirements

Reference(s) provided to the student:
None

You have completed the test!