

FACILITY NAME: HATCH

Section 3

REPORT NUMBER: 05000321/2009302 AND 05000366/2009302

DRAFT SRO WRITTEN EXAM

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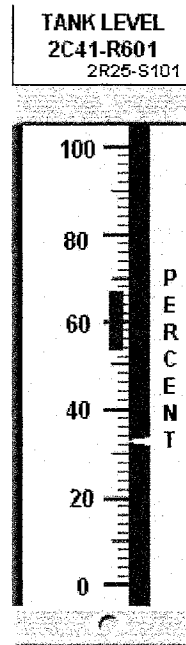
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Submitted By: Bruno Caballero

Verified By: *Mark J. Riches*

Unit 2 was operating at 100% power when a transient occurred causing the following conditions/indications:

- o APRMs 0% power (100 control rods not full in)
- o Recirc pumps Both Tripped
- o RWL -60" to -90" controlled by RFPT 2B
- o Reactor pressure 843 psig controlled by EHC
- o SBLC 2A injecting with the following tank level



Which ONE of the choices below completes the following statement?

IAW EOP flowcharts, the Shift Supervisor will direct RWL to be _____ and for reactor pressure to be _____

- A. maintained in the present band;
maintained at the present EHC setpoint
- B. maintained in the present band;
lowered, but NOT to exceed a 100°F/hr cooldown rate
- C. raised to between +3" to +50";
maintained at the present EHC setpoint
- D. raised to between +3" to +50";
lowered, but NOT to exceed a 100°F/hr cooldown rate

Description:

Based upon the conditions/indications an ATWS is in progress requiring SBLC injection. Reactor pressure and level are set IAW RCA & CP-3 flowcharts. SBLC tank level is indicating below 35% (Hot Shutdown Boron Weight - HSBW). With SBLC tank level <35%, CP-3 allows RWL to be raised to +3" to +50" while monitoring power. Reactor pressure will be maintained at its present EHC setpoint until either all rods are inserted or Cold Shutdown Boron Weight is injected.

Maintaining present RWL band would be plausible if the candidate does not recognize the value or the required actions for HSBW, therefore maintains the present band.

Lowering reactor pressure is plausible because with both recirc pumps tripped (Non-ATWS), an aggressive cooldown will be started to minimize thermal stratification. Also if the candidate confuses the actions required when CSBW is injected, commencing a pressure reduction would be valid.

- A. **Incorrect** - See description above.
- B. **Incorrect** - See description above.
- C. **Correct** - See description above.
- D. **Incorrect** - See description above.

Reference(s) provided to the student:

None

K/A: 211000G2.2.44 SLC

2.2.44 Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.
(CFR: 41.5 / 43.5 / 45.12) IMPORTANCE RO 4.2 SRO 4.4

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

EOP-CP3-LP-20327, "Level / Power Control (CP-3)", EO 201.092.A.02 & .09

Reference(s) used to develop this question:

EOP-CP3-LP-20327, "Level / Power Control (CP-3)"
31EO-EOP-017-2, "CP-3 ATWS Level Control"

Unit 1 is in Startup making preparations to transfer the mode switch to RUN.

All IRMs are reading between 25 on range 9 and 30 on range 10.

I&C reports that ALL IRMs are inoperable for their neutron flux - High trip (will not give trip).

All other requirements of 34GO-OPS-001-1, "Plant Startup," are met for going to "Run" mode.

Which ONE of the choices below completes the following statements?

IAW TS Bases 3.3.1.1, the purpose of the IRM Neutron Flux - High function is to monitor neutron flux levels from the upper range of the Source Range Monitors to the lower range of the _____ Power Range Monitors.

IAW with Tech Spec 3.0.4, the Reactor Mode Switch _____ be placed in the "RUN" mode.

- A. Oscillation;
can
- B. Average;
can
- C. Average;
can NOT
- D. Oscillation;
can NOT

Description:

Unit 1 TS Bases B 3.3.1.1 "Applicable Safety Analysis LCO, and Applicability 1a. IRM Neutron Flux-High states that IRMs monitor neutron flux levels from the upper range of the Source Range Monitors to the lower range of the Average Power Range Monitors.

OPRMS are plausible because 34GO-OPS-001-1 step 7.4.7 requires confirmation that 3 APRMs & 3 OPRMs are operable prior to transferring the mode switch to "Run".

TS 3.0.4 states:

"When an LCO is not met, entry into a MODE or other specified Condition in the Applicability shall only be made:

- a. When the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time,"

Since IRMs are not required to be operable in mode 1, the mode switch can be place in "Run". Plausible if the candidate does not remember 3.0.4 requirements.

- A. **Incorrect** - 1st part; see description above.
2nd part is correct
- B. **Correct** - see description above
- C. **Incorrect** - 1st part is correct
2nd part; see description above.
- D. **Incorrect** - 1st part; see description above.
2nd part; see description above.

Reference(s) provided to the student:

None

K/A: 215003G2.1.27 IRM

2.1.27 Knowledge of system purpose and/or function. (CFR: 41.7)

IMPORTANCE RO 3.9 SRO 4.0

SRO only because of link to 10CFR55.43 (2): Facility operating limitations in the technical specifications and their bases.

LESSON PLAN/OBJECTIVE:

C51-IRM-LP-01202 EO 012.003.C.02

Reference(s) used to develop this question:

Unit 1 TS 3.3.1.1 Reactor Protection System Instrumentation (page 3.3-1 thru 3.3-6)

Unit 1 Bases 3.3.1.1 (page B3.3-4)

C51-IRM-LP-01202

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78. 216000A2.14 001/2/2/RPV INSTRUMENTATION/NEW/HIGHER/HT2009-302/SRO/ARB/CME

Unit 2 is operating at 100% reactor power when the "2A" Recirc pump trips.

Which ONE of the following completes both of these statements?

Indicated reactor water level on 2C32-R606A, B and C, "Narrow Range" instruments will initially _____ .

IAW with Tech Specs 3.4.1, "Recirculation Loops Operating", the MAXIMUM amount of time allowed to satisfy the LCO for Recirc pump single loop operation is _____ hours.

- A. increase;
12
- B. increase;
24
- C. decrease;
24
- D. decrease;
12

Description:

When the Recirc pump trips, indicated reactor water level will increase due to formation of more voids in the core. This additional voided area will increase the backpressure in the downcomer region, causing annulus level to rise. Since RWL is measured in the annulus region, indicated RWL increases. Also the recirc pump, that trips, will stop entraining water from the downcomer region causing indicated RWL to increase.

IAW with Tech Specs 3.4.1, "Recirculation Loops Operating", Condition "A", (Required Action A.1) requires the LCO to be met in 24 hours. RWL decreasing is plausible because as voids increase in the core, water level in the core will actually decrease. 12 hours is plausible because this is the time requirement for exceeding Condition A.

- A. **Incorrect** - See description above.
- B. **Correct** - See description above.
- C. **Incorrect** - See description above.
- D. **Incorrect** - See description above.

Reference(s) provided to the student:

None

K/A: 216000A2.14 Nuclear Boiler Inst.

A2. Ability to (a) predict the impacts of the following on the NUCLEAR BOILER INSTRUMENTATION ; 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)

A2.14 Recirculation flow: Design-Specific 2.9 2.9

SRO only because of link to 10CFR55.43 (2): Facility operating limitations in the technical specifications and their bases.

LESSON PLAN/OBJECTIVE:

Reference(s) used to develop this question:

Tech Specs 3.4.1, "Recirculation Loops Operating", Condition "A", (Required Action A.1)

Fuel movement is in progress on **Unit 2** along with control rod un-coupling.

IAW 34GO-OPS-066-0, "Control Rod Withdrawal in Shutdown or Refeul," the Control Room Operator has just withdrawn a control rod to position 48, but the full-in reed switch has NOT been bypassed.

The Refueling Bridge is over the Fuel Pool and loaded with a fuel assembly.

When the Refueling Bridge Operator positions the Refueling Bridge over the proper core coordinates, the Reactor Operator in the Main Control Room informs the Refueling SRO that annunciator 603-238 "ROD OUT BLOCK" is now alarming.

Which ONE of the following describes the impact on the refueling operations and the required action IAW Tech Spec 3.9 "Refueling Operations"?

- A. The Refueling Platform should have automatically stopped prior to reaching the Reactor Cavity. Suspension of fuel movement is required after placing the fuel assembly in any available Spent Fuel Pool location.
- B. The Refueling Platform should have automatically stopped prior to reaching the reactor cavity. Suspension of fuel movement is required after placing the fuel assembly in any available Core location.
- C. The Refueling Grapple is prevented from lowering. Bypassing the full-in reed switch is required and then continued fuel movement is allowed.
- D. The Refueling Grapple is prevented from lowering. Fully inserting the withdrawn control rod is required and then continued fuel movement is allowed.

Description:

TS Bases 3.9 "Refueling Operations" states a control rod not at its full-in position interrupts power to the refueling equipment and prevents operating the equipment over the reactor core when loaded with a fuel assembly. Conversely, the refueling equipment located over the core and loaded with fuel inserts a control rod withdrawal block in the Control Rod Drive System to prevent withdrawing a control rod.

TS Bases 3.9.1 Refueling Interlocks - Criticality and, therefore, subsequent prompt reactivity excursions are prevented during the insertion of fuel, provided all control rods are fully inserted during the fuel insertion. The refueling interlocks accomplish this by preventing loading of fuel into the core with any control rod withdrawn or by preventing withdrawal of a rod from the core during fuel loading.

SRO only because of knowledge of TS Bases 3.9 which states: "Suspension of in-vessel fuel movement shall not preclude completion of movement of a component to a safe position." The safe position would be to place the fuel assembly back to any fuel pool location and not into any core location.

A. **Correct** - See description above

B. **Incorrect** - 1st part is correct.

2nd part is incorrect due to description above. Plausible if the candidate believes that a fuel assembly can be placed into any core location. Actually a fuel bundle can be placed into any fuel pool location.

C. **Incorrect** - 1st part is correct.

2nd part is incorrect due to description above. Plausible if the candidate believes that bypassing the full-in reed switch is the only refueling interlock problem and does not remember that bridge travel should have been stopped before reaching the core location.

D. **Incorrect** - 1st part is correct.

2nd part is incorrect due to description above. Plausible if the candidate believes that inserting the withdrawn control rod is the only refueling interlock problem and does not remember that bridge travel should have been stopped before reaching the core location.

Reference(s) provided to the student:

None

K/A: 234000G2.2.25 Fuel Handling Equipment

2.2.25 Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits. (CFR: 41.5 / 41.7 / 43.2) IMPORTANCE RO 3.2 SRO 4.2

SRO only because of link to 10CFR55.43 (2): Facility operating limitations in the technical specifications and their bases.

LESSON PLAN/OBJECTIVE:

F15-RF-LP-04502 "Refueling" EO 045.018.a.01 & EO 3045.019.a.02

Reference(s) used to develop this question:

F15-RF-LP-04502 "Refueling"
TS Bases - 3.9.1 "Refueling Interlocks"
TS Bases - 3.9.2 "Refuel Position One-Rod-Out Interlock"
TS Bases - 3.9.3 "Control Rod Position"

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Unit 2 is at 100% with fuel movement in progress during cask loading.

Minor damage to a fuel bundle results in the Refueling Floor Area radiation levels reaching 70 mr/hr:

The "Refueling Floor Vent Exhaust" monitors are reading:

- o 2D11-K634A - 15 mRem/hr
- o 2D11-K634B - 14 mRem/hr
- o 2D11-K634C - 18 mRem/hr
- o 2D11-K634D - 19 mRem/hr

Which ONE of the following predicts BOTH the impact of these conditions on the Unit 1 and Unit 2 Standby Gas Treatment Systems (SBGT) and the procedural requirements?

The total number of SBGTs trains that will automatically start is _____ .

The Shift Supervisor will direct the entry into _____ .

A. two (ONLY);

34AB-D11-001-2, "Radioactivity Release Control" and perform a Prompt Offsite Dose Assessment ONLY

B. four;

34AB-D11-001-2, "Radioactivity Release Control" and perform a Prompt Offsite Dose Assessment

AND

34GO-OPS-013-2, "Normal Plant Shutdown" and perform a normal plant shutdown

C. two (ONLY);

34AB-D11-001-2, "Radioactivity Release Control" and perform a Prompt Offsite Dose Assessment

AND

34GO-OPS-013-2, "Normal Plant Shutdown" and perform a normal plant shutdown

D. four;

34AB-D11-001-2, "Radioactivity Release Control" and perform a Prompt Offsite Dose Assessment ONLY

Description: There are 12 Refuel Floor Process Radiation monitors.

Setpoints:

- o 2D11-K634A-D rad monitors for U2 5.7 mR/hr
- o 2D11-K635A-D rad monitors for U2 6.9 mR/hr
- o 2D11-K611A-D rad monitors for U2 18 mR/hr

With all 4 of the 2D11-K634 rad monitors above the setpoint, all 4 SBT systems will auto start.

34AB-T22-003-2 "Secondary Containment Control" directs the entry into 34AB-D11-001-2 "Radioactivity Release Control" which dictates that a Prompt Offsite Dose Assessment must be performed 73EP-EIP-018-0.

For **plausibility**, the following system operation was considered. Exceeding the setpoint on the "A" and "B" monitors auto start only SBT "A." The system requires monitors "C" and "D" to reach their setpoints to auto start the "B" fan of SBT. U1 only has 4 process rad monitors for the Refuel Floor with a setpoint of 18 mR/hr.

For **plausibility**, EOP SC flowchart does direct entry into 34GO-OPS-013-2, "Normal Plant Shutdown" after Max Safe is reached in more than one area. The Refuel Floor rad levels are high enough to exceed Max Normal (50 mr/hr) but not high enough to exceed Max Safe (1000 mr/hr) which would require shutting down the plant.

- A. **Incorrect** - See description above.
- B. **Correct** - See description above.
- C. **Incorrect** - See description above.
- D. **Incorrect** - See description above.

Reference(s) provided to the student:

None

K/A: 261000A2.12 SGTS

A2. Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM ; 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)

A2.12 High fuel pool ventilation radiation: Plant-Specific 3.2 3.4

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

T46-SBGT-LP-03001, "Standby Gas Treatment System" 030.006.a.01

Reference(s) used to develop this question:

34AB-T22-003-2, "Secondary Containment Control"
34AB-D11-001-2 "Radioactivity Release Control"

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81. 264000A2.09 001/2/1/EDG/NEW/HIGHER/HT2009-302/SRO/ARB/CME

Both Units are operating at 100% power with all systems normally aligned when a seismic event damages the switchyard and ALL offsite power is lost to BOTH units. A SO has been dispatched to monitor EDG parameters.

Current time is 10:00 a.m.

- o At 10:05 Unit 1 receives a LOCA signal
- o At 10:10 Unit 2 receives a LOCA signal

Which ONE of the following predicts the impact of the LOSP on the 1B Emergency Diesel Generator (EDG) and the Shift Supervisors procedural direction for these conditions?

At 10:01 a.m. EDG 1B is supplying _____ Emergency Bus.

At 10:11 a.m. the Shift Supervisor will direct an operator to enter _____ the 1B EDG.

- A. 1F;
34AB-R43-001-2 "Diesel Generator Recovery" and trip
- B. 2F;
34SO-R43-001-2 "Diesel Generator Standby AC System" and continue monitoring
- C. 2F;
34AB-R43-001-2 "Diesel Generator Recovery" and trip
- D. 1F;
34SO-R43-001-2 "Diesel Generator Standby AC System" and continue monitoring

Description:

34AB-R43-001-2, 'Diesel Generator Recovery' Attachment 3 lists which unit will receive power from the 1B EDG. In this case, the 1B EDG will supply power to Unit 1 until the LOCA signal is received on Unit 2, at which time the 1B EDG will not be supplying power to either unit or will be automatically cycling between the units.

34AB-R22-002-2 "Loss Of 4160V Emergency Bus" Step 4.3.2 states IF SAT 2C AND 2D are NOT available, energize bus from associated Diesel Generator in accordance with 34AB-R43-001-2, Diesel Generator Recovery. 34AB-R43-001-2 states

4.2 LOCA and LOSP ACTIONS

4.2.1 IF concurrent LOCA AND LOSP signals are present on both units,
THEN perform the following:

4.2.1.1 At the 1B D/G room,
TRIP the 1B D/G by depressing the EMERGENCY STOP pushbutton.

therefore the 1B EDG is tripped locally.

Plausible if the candidate does not remember the need to trip the 1B EDG, then continued monitoring of EDG parameters will be done.

- A. **Correct** - See description above.
- B. **Incorrect** - See description above.
- C. **Incorrect** - See description above.
- D. **Incorrect** - See description above.

Reference(s) provided to the student:

None

K/A: 264000A2.09 EDGs

A2. Ability to (a) predict the impacts of the following on the EMERGENCY GENERATORS (DIESEL/JET) ; 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)

A2.09 Loss of A.C. power 3.7 4.1

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

R43-EDG-LP-02801 "Emergency Diesel Generators" EO 028.025.A.04

Reference(s) used to develop this question:

R43-EDG-LP-02801 "Emergency Diesel Generators"
34AB-R43-001-2 "Diesel Generator Recovery"

Unit 1 is operating at 100% power when the "1A" RWCU pump develops a severe leak and cannot be isolated. Area temperatures on the 158' Reactor Building are as followed:

Ambient Temperatures:

Pt.2 Hx Room (1G31-N016B)	180°F
Pt.3 "A" Pump Room (North) (1G31-N016C)	175°F

Differential Temperatures:

Pt.1 Hx Room (1G31-N022A/N023A)	100°F
Pt.2 A Pump Room (1G31-N022B/N023B)	100°F

Which ONE of the following choices correctly predicts the impact on 1D11-K609A-D "RB Bldg. Contaminated Area Radiation" monitors AND the action to control these conditions?

When 1D11-K609A-D monitors exceed _____, the Reactor Building HVAC system will isolate.

IAW EOP flowcharts, after the reactor has been shutdown, reactor pressure will be lowered using EOP flowchart _____.

REFERENCE PROVIDED

- A. 6.9 mr/hr;
RC/P maintaining <100°F/hr cooldown
- B. 18 mr/hr;**
RC/P maintaining <100°F/hr cooldown
- C. 18 mr/hr;
CP-1 point G "Emergency Depress"
- D. 6.9 mr/hr;
CP-1 point G "Emergency Depress"

Description:

1D11-K609A-D "Reactor Bldg. Exhaust Radiation" monitors will trip at a setpoint of 18 mr/hr. Once tripped all supply/exhaust fans and all isolation valves, trip and isolate. After the reactor has been shutdown, reactor pressure will be controlled by RC/P, maintaining <100°F/hr cooldown. IAW SC/RR flowchart, with a primary system discharging, an emergency depress will be required when a Max Safe is exceeded in more that one area. In this question, only one Max Safe temperature has been exceeded (differential temps), therefore, reactor pressure will be controlled by RC/P.

Plausible if candidate remembers the wrong monitor 2D11-K634A-D "U2 Refuel Floor Vent Exhaust" trip setpoint of 6.9 mr/hr.

Plausible for emergency depress if candidate does not remember that it takes two Max Safes exceeded in more that one area to emergency depress.

- A. **Incorrect** - 1st part is the wrong exhaust rad monitor setpoint.
2nd part is correct.
- B. **Correct** - See description above.
- C. **Incorrect** - 1st part is correct.
2nd part is incorrect due to NOT having a Max Safe exceeded in more that one area.
- D. **Incorrect** - 1st part is the wrong exhaust rad monitor setpoint.
2nd part is incorrect due to NOT having a Max Safe exceeded in more that one area.

Reference(s) provided to the student:

Table 4 of 31EO-EOP-014-1, SC/RR Flowchart

K/A: 272000A2.11 Radiation Monitoring

A2. Ability to (a) predict the impacts of the following on the RADIATION MONITORING SYSTEM ; 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)

A2.11 Leakage and/or breaks from contaminated systems to atmosphere or to other process systems 3.4 3.7

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

D11-PRM-LP-10007 "Process Rad Monitor" EO 200.030.a.10
EOP-SCRR-LP-20325 "Secondary Containment / Radioactivity Release Control" EO
201.077.A.02, 201.079.A.05.

Reference(s) used to develop this question:

D11-PRM-LP-10007 "Process Rad Monitor" EO 200.030.a.10
EOP-SCRR-LP-20325 "Secondary Containment / Radioactivity Release Control" EO
201.077.A.02, 201.079.A.05.
31EO-EOP-014-1 SC/RR flowchart

Unit 2 is at operating at 59% power with both Recirc Pumps operating at 48% speed when a transient occurs. Reactor power stabilizes at 57% power with the following Recirc indications:

- o "A" and "B" Recirc Pump Speeds 48%
- o 2B21-R611A "TOTAL A FLOW" 24 Mlbm/hr
- o 2B21-R611B "TOTAL B FLOW" 12 Mlbm/hr

The crew performs 34SV-SUV-023-2, "Jet Pump and Recirculation Flow Mismatch Operability".

Jet Pumps 5 & 6 show a 50% difference from the current average jet pump differential pressures.

IAW Tech Specs 3.4.1, "Recirculation Loops Operating" and 3.4.2, "Jet Pumps" which ONE of the following choices completes both of these statements concerning the operational status of the Recirc Pump loops, AND the MOST LIMITING required actions for the Recirc Loop and JET pump conditions?

The Reactor Recirculation system is considered to be operating in _____ Loop Operation. The SRO will direct the operator to _____ .

- A. single;
enter 34SO-B31-001-2, " Reactor Recirc System"and raise "B" loop flow within 24 hours.
- B. single;
enter 34GO-OPS-013-2 "Normal Plant Shutdown" and be in mode 3 within 12 hours.
- C. Two;
enter 34SO-B31-001-2, " Reactor Recirc System"and raise "B" loop flow within 24 hours.
- D. Two;
enter 34GO-OPS-013-2 "Normal Plant Shutdown" and be in mode 3 within 12 hours.

Description:

Tech Spec Bases is required for the operator to know single or two loop operation.
Tech Spec Surveillences is required for the operator to know that >20% mismatch makes a jet pump inoperable and requires a shutdown.

- A. **Incorrect** - See description above.
- B. **Correct** - See description above.
- C. **Incorrect** - See description above.
- D. **Incorrect** - See description above.

Reference(s) provided to the student:

NONE

K/A: 295001A2.04 Partial or Complete Loss of Forced Core Flow Circulation

AA2. Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION :
(CFR: 41.10 / 43.5 / 45.13)

AA2.04 Individual jet pump flows: Not-BWR-1&2..... 3.0 3.1

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

B31-RRS-LP-00401 "Reactor Recirculation System" EO 200.084.A.01

Reference(s) used to develop this question:

B31-RRS-LP-00401 "Reactor Recirculation System" EO 200.084.A.01
34AB-B21-004-0, "Jet Pump Failure"
34AB-B31-001-2, "Reactor Recirculation Pump(S) Trip, Or Recirc Loops Flow Mismatch, Or ASD Power Cell Failure"

Unit 2 is at 80% power with a normal plant shutdown in progress due to a loss of 250V DC MCC-2B RX BLDG FEEDER, 2R24-S022.

A transient occurs causing the following conditions:

- o APRMs 6%
- o RWL -175 inches, going down 2"/min
- o DW pressure 3.5 psig
- o Reactor pressure 880 psig controlled by LLS
- o MSIVs closed

Which ONE of the following completes both statements?

The _____ System can be used for RWL control.

IAW EOP flowcharts, if the current RWL trend continues for the next 5 minutes, the SS will direct the operator to perform _____ to control RWL.

- A. HPCI;
31EO-EOP-114-2, "Preventing Injection Into The RPV From Core Spray And LPCI"
- B. RCIC;
31EO-EOP-114-2, "Preventing Injection Into The RPV From Core Spray And LPCI"
- C. HPCI;
31EO-EOP-113-2, "Terminating And Preventing Injection Into The RPV"
- D. RCIC;
31EO-EOP-113-2, "Terminating And Preventing Injection Into The RPV"

Description:

With 250V DC MCC-2B RX BLDG FEEDER, 2R24-S022 deenergized, the HPCI System will not be available for RWL control due to no power to operate MOVs. RCIC will be used to inject into the RPV but with Rx power above RCIC capability, RWL will continue to lower.

LAW EOP-CP-3, -155" is the lowest level at which injection must be re-established via Table 13 systems. The only high pressure systems available would be RCIC, CRD and SLC. These 3 can put out a combined flow of about 750 gpm (CRD - 300gpm, RCIC - 400gpm, SLC - 50gpm). At 6% power flow needed would be about 1,500 gpm. So level can not be maintained greater than -185" and an Emerg. Depress. is required.

CP-3 calls for 31EO-EOP-113 to be used prior to an emergency depress. 31EO-EOP-114 "Preventing Injection Into The RPV From Core Spray And LPCI" can be used when Drywell pressure is above 1.85 psig. However, it is not allowed when adequate core cooling is not assured. 31EO-EOP-114 is plausible but wrong.

- A. **Incorrect** - See description above.
- B. **Incorrect** - See description above.
- C. **Incorrect** - See description above.
- D. **Correct** - See description above.

Reference(s) provided to the student:

None

K/A: 295004G2.1.23 Partial or Total Loss of DC Pwr

2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation. (CFR: 41.10 / 43.5 / 45.2 / 45.6) IMPORTANCE RO 4.3 SRO 4.4

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

Reference(s) used to develop this question:

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85. 295005A2.02 001/1/1/MAIN TURBINE/NEW/HIGHER/HT2009-302/SRO/ARB/CME

Unit 2 is operating at 25% power when alarm 650-136 "Vibration Alarm" is received.

The Main Turbine is operating with the following vibration indications:

- o Bearing #1X - 11 mils
- o Bearing #1Y - 10 mils
- o Bearing #2X - 14 mils
- o Bearing #2Y - 10 mils

Which ONE of the following completes both statements concerning Main Turbine operation?

IAW with the "Vibration Alarm" ARP, the Unit 2 Main Turbine _____ exceeded the automatic trip setpoint for high vibration.

If continued turbine operation is desired, the LOWEST level of authority required to disable the high vibration trips is the _____ .

- A. has NOT;
Shift Supervisor
- B. has;
Operations Manager
- C. has NOT;
Operations Manager
- D. has;
Shift Supervisor

Description:

Per 34SO-N30-001-2 the High vibration trip is 12 mils on any bearing (2 of 2 probes for one or more bearings) Per 34AR-650-136-2 the Main Turbine High Vibration Trips may be disabled with the OPS Manager and System Engineer approval.

- A. **Incorrect** - See description above.
- B. **Incorrect** - See description above.
- C. **Correct** - See description above.
- D. **Incorrect** - See description above.

Reference(s) provided to the student:

None

K/A: 295005A2.02 Main Turbine Generator Trip

AA2. Ability to determine and/or interpret the following as they apply to MAIN TURBINE GENERATOR TRIP: (CFR: 41.10 / 43.5 / 45.13)

AA2.02 Turbine Vibration.....2.4 / 2.7

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

N30-MTA-LP-01701 "Main Turbine" EO 017.004.A.02

Reference(s) used to develop this question:

N30-MTA-LP-01701 "Main Turbine"

Unit 2 is at 100% power when a transient occurs causing the following alarm to be received:

REACTOR VESSEL HIGH PRESSURE TRIP (603 -105)

Also as a result of the transient, Torus water level decreases to 88".

The operator controlling Rx pressure reports that ONLY 4 SRVs are operable.

Which ONE of the following identifies the alarm setpoint and the required procedure to control reactor pressure?

The alarm setpoint is _____ psig.

IAW 31EO-EOP-015-2, "CP-1", the SS will direct RPV pressure control using _____ .

- A. 1074;
31EO-EOP-107-2 "Alternate RPV Pressure Control"
- B. 1055;
31EO-EOP-107-2 "Alternate RPV Pressure Control"
- C. 1074;
31EO-EOP-108-2 "Alternate RPV Depressurization"
- D. 1055;
31EO-EOP-108-2 "Alternate RPV Depressurization"

Description:

ARP 603-105 setpoint is 1074 psig. 1055 psig is plausible since this is the high reactor pressure setpoint per ARP 603-114.

A torus level that can not be maintained greater than 98" requires an Emergency Depress. 4 SRVs is below the limit for the number of SRVs required for emergency depress (5 required). Since the minimum is not met, CP-1 requires the SS to direct the operator to use 31EO-EOP-108-2 "Alternate RPV Depressurization" for reactor pressure control.

31EO-EOP-107-2 "Alternate RPV Pressure Control" is plausible since this procedure is used for RPV pressure control, but not in this situation.

- A. **Incorrect** - See description above.
- B. **Incorrect** - See description above.
- C. **Correct** - See description above.
- D. **Incorrect** - See description above.

Reference(s) provided to the student:

None

K/A: 295007A2.01 High Reactor Pressure

AA2. Ability to determine and/or interpret the following as they apply to HIGH REACTOR PRESSURE : (CFR: 41.10 / 43.5 / 45.13)

AA2.01 Reactor pressure..... 4.1* 4.1*

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

C71-RPS-LP-01001 "Reactor Protection System" EO 300.008.a.02
B11-RXINS-LP-04404 "Reactor Vessel Instrumentation" EO 200.002.A.12
EOP-CP1-LP-20309, "CP-1" EO 201.085.A.15

Reference(s) used to develop this question:

31EO-EOP-015-2, "CP-1"
31EO-EOP-107-2, "Alternate RPV Pressure Control"
31EO-EOP-108-2, "Alternate RPV Depressurization"
C71-RPS-LP-01001 "Reactor Protection System" EO 300.008.a.02
B11-RXINS-LP-04404 "Reactor Vessel Instrumentation" EO 200.002.A.12
EOP-CP1-LP-20309, "CP-1" EO 201.085.A.15

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87. 295012G2.4.11 001/1/2/DW COOLING/NEW/HIGHER/HT2009-302/SRO/ARB/CME

Unit 2 is operating at 100% RTP when an electrical problem causes a loss of DW cooling.

The following conditions exist at 12:00:

UPPER	MIDDLE	LOWER
2T47-N002:..... 302°F	2T47-N003:..... 235°F	2T47-N001L:..... 195°F
2T47-N010:..... 298°F	2T47-N009:..... 233°F	2T47-N004:..... 193°F
2T47-N001A:... 296°F		2T47-N007:..... 196°F
2T47-N001K:... 301°F		2T47-N008:..... 194°F

IAW 34AB-T47-001-2 "Complete Loss of DW Cooling", which ONE of the following choices identifies the time limit allowed for temperature restoration and the required procedural direction if temperature cannot be restored?

If Drywell temperatures cannot be reduced by no later than _____ enter _____ .

REFERENCE PROVIDED

- A. 1230
34GO-OPS-013-2 "Normal Plant Shutdown".
- B. 1300
34GO-OPS-013-2 "Normal Plant Shutdown".
- C. 1230
34GO-OPS-014-2 "Fast Reactor Shutdown"
- D. 1300
34GO-OPS-014-2 "Fast Reactor Shutdown"

Description:

34AB-T47-001-2 "Complete Loss of DW Cooling" contains a subsequent action that if any of the temperatures are exceeded in Attachment 1, then a 30 minute clock starts for restoring temperatures. If this time limit is exceeded, then a fast reactor shutdown will be initiated per 34GO-OPS-014-2.

34GO-OPS-013-2, "Normal Plant Shutdown" is plausible because this is the normal plant shutdown procedure.

1 hour time limit is plausible if the candidate thinks the high temperature affects Tech Spec 3.6.1.1, "Primary Containment Operability" (the actual design limit is 340 deg F). The LCO would require containment to be restored to operable status in 1 hour, Mode 3 in 12 hours, Mode 4 in 36 hours (a normal shutdown).

- A. **Incorrect** - See description above.
- B. **Incorrect** - See description above.
- C. **Correct** - See description above.
- D. **Incorrect** - See description above.

Reference(s) provided to the student:

34AB-T47-001-2 "Complete Loss of DW Cooling" Attachment 1 **without "Maximum 30 minute"** column heading

K/A: 295012G2.4.11 High Drywell Temperature

2.4.11 Knowledge of abnormal condition procedures. (CFR: 41.10 / 43.5 / 45.13)
IMPORTANCE RO 4.0 SRO 4.2

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

Reference(s) used to develop this question:

34AB-T47-001-2 "Complete Loss of DW Cooling"

Unit 2 is at 15% power following a refueling outage.

- o HPCI is running for surveillance 34SV-E41-002-2, "HPCI PUMP OPERABILITY".
- o Annunciator "TORUS WATER TEMP HIGH" (654-020) alarms
- o Bulk Suppression Pool temperature reaches 102°F and stabilizes

Which ONE of the choices below completes the following statement?

IAW Tech Specs 3.6.2.1, "Suppression Pool Average Temperature", the Shift Supervisor will direct that suppression pool temperature be monitored, as a MINIMUM, every _____ minutes and/but HPCI testing _____ continue.

- A. 30;
can
- B. 30;
can NOT
- C. 5;
can
- D. 5;
can NOT

Description:

IAW 34AB-T23-003-2 and Tech Spec SR 3.6.2.1.1:

Logging of suppression pool temperature every 5 minutes is required when adding heat to the Torus. 30 minute checking is required if temp is between 110-120 and mode switch is placed in shutdown.

Testing is required to be suspended at 105 deg F. The EOPs were entered at 100 deg F and allow for both loops of RHR to be placed in suppression pool cooling. With temperature stable at 102 deg F, testing can continue.

- A. **Incorrect** - See description above.
- B. **Incorrect** - See description above.
- C. **Correct** - See description above.
- D. **Incorrect** - See description above.

Reference(s) provided to the student:

None

K/A: 295013A2.01 High Suppression Pool Temp.

AA2. Ability to determine and/or interpret the following as they apply to HIGH SUPPRESSION POOL TEMPERATURE : (CFR: 41.10 / 43.5 / 45.13)

AA2.01 Suppression pool temperature..... 3.8 4.0

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

T23-PC-LP-01301, LT-48

Reference(s) used to develop this question:

Modified from Browns Ferry 2008 SRO Exam, question 79

T23-PC-LP-01301

34AB-T23-003-2

Tech Spec SR 3.6.2.1.1.

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89. 295019A2.02S 001/1/1/AIR/NEW/HIGHER/HT2009-302/SRO/ARB/CME

Unit 2 is at 100% power with the following conditions:

- o An un-isolable air line break occurs just downstream of the SSAC air receivers which results in a Control Air header Pressure of 20 psig and going down.

Which ONE of the following completes both of these statements?

Without any operator actions, the 2P52-F565 "Rx Bldg Inst N₂ To Non-Int Air El 185 Isol Vlv" will open and _____ .

IAW 50AC-MNT-001-0, "Maintenance Program," section 8.1.7, "Emergency Maintenance", the Shift Supervisor _____ required to sign the Work Order PRIOR to repairs being performed on the leak.

- A. remain open;
is
- B. cycle closed and open;
is
- C. remain open;
is NOT
- D. cycle closed and open;
is NOT

Description:

IAW 34AB-P51-001-2, "Loss Of Instrument And Service Air System Or Water Intrusion Into The Service Air System" a caution prior to step 4.14.6 states:

"Allowing 2P52-F565 to continuously cycle full open to full closed could cause excessive duty on the valve motor and may cause the eventual failure of the motor."

50AC-MNT-001-0, "Maintenance Program," section 8.1.7, "Emergency Maintenance" states that Emergency Maintenance may be performed without a Work Order (WO). In this case, the SS will not have the WO, therefore, the signature is not required. Emergency Maintenance will be documented/reviewed promptly after completion of the work. Section 8.5.9, "Work Authorization" states the applicable Unit SS will authorize plant maintenance.

Plausible because "Limitations" step 6.2.4 states "Approval in the Released for Work block of the Work Order is required for plant related work prior to physical work on plant equipment".

- A. **Incorrect** - See description above.
- B. **Incorrect** - See description above.
- C. **Incorrect** - See description above.
- D. **Correct** - See description above.

Reference(s) provided to the student:

None

K/A: 295019A2.02 Partial or Total Loss of Inst. Air

AA2. Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR : (CFR: 41.10 / 43.5 / 45.13)

AA2.02 Status of safety-related instrument air system loads
(see AK2.1 - AK2.19 Below)..... 3.6 3.7

AK2.14 Plant air systems..... 3.2 3.2

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

P51-P52-P70-Plant Air-LP-03501 'Plant Air Systems' EO 200.025.B.02

Reference(s) used to develop this question:

P51-P52-P70-Plant Air-LP-03501 'Plant Air Systems'
34AB-P51-001-2, "Loss Of Instrument And Service Air System Or Water Intrusion Into The Service Air System"

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90. 295030G2.1.20 001/1/1/TORUS LEVEL/NEW/HIGHER/HT2009-302/SRO/ARB/CME

Unit 2 was operating at 100% power when a transient resulted in the following conditions:

- o Reactor Power2.5% (Highest power since scram was 9%)
- o Reactor pressure960 psig maintained by LLS
- o Reactor water level-85" maintained using RCIC IAW CP-3 flowchart
- o Torus level97 inches and slowly lowering
- o HPCIOut of service

Which ONE of the following completes both of these statements?

IAW 31EO-EOP-012-2, "PC Primary Containment Control" flow chart, continued operation of the RCIC system _____ allowed.

The NEXT required EOP step the Shift Supervisor will direct the operator to perform is from EOP Flowchart _____ .

A. is;

CP-1, OPEN 7 ADS valves

B. is NOT;

CP-1, OPEN 7 ADS valves

C. is NOT;

CP-3, Terminate & Prevent ALL injection into the RPV

D. is;

CP-3, Terminate & Prevent ALL injection into the RPV

Description:

The PC "Primary Containment Control" flowchart requires HPCI to be tripped irrespective of adequate core cooling when Torus level cannot be maintained above 110". RCIC exhaust flowrate is approximately equal to that of decay heat, and is thus consistent with the basis used for determining the Primary Containment Pressure Limit. Also elevated torus pressure will cause the RCIC turbine to trip much sooner than the HPCI turbine, therefore RCIC is allowed to continue to run.

Plausible if candidate remembers that either HPCI or RCIC is secured on Torus level low.

An emergency depressurization is required with Torus level less than 98".

Per 31EO-EOP-015-2, "Alternate Level Control, CP-1, point G for emergency depress, the SS will wait until ALL injection into RPV has been terminated before giving the order to open 7 ADS valves. Per 31EO-EOP-017-2, " "CP-3 ATWS Level Control", when an emergency depress is required, CP-3 will direct the SS to order "Terminate & Prevent" before 7 ADS valves can be opened.

Plausible if candidate does not remember that a terminate and prevent in an ATWS must be completed prior to opening 7 ADS valves.

- A. **Incorrect** - See description above.
- B. **Incorrect** - See description above.
- C. **Incorrect** - See description above.
- D. **Correct** - See description above.

Reference(s) provided to the student:

None

K/A: 295030G2.1.20 Low Suppression Pool Wtr Lvl

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

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

EOP-PC-LP-20310 "Primary Containment Control (PC)" EO 201.075.A.11 & A.13

Reference(s) used to develop this question:

EOP-PC-LP-20310 "Primary Containment Control (PC)"
31EO-EOP-012-2, "PC Primary Containment Control" flow chart

Unit 2 was operating at 100% power when a transient occurred causing the following indications:

- o 2B21-R623A "Fuel Zone" -160 inches, decreasing 2"/minute
- o 2B21-R623B "Fuel Zone" -163 inches, decreasing 2"/minute

- o RHR Pump "2D" Green and White lights are illuminated,
Red light extinguished

Which ONE of the following completes both of these statements?

RHR pump "2D" has _____ ;

Reactor water level control will be directed from _____ .

- A. been manually secured;
31EO-EOP-010-2, "RC" (Non-ATWS) flow chart, RC/L path
- B. been manually secured;
31EO-EOP-015-2, "CP-1" flow chart, Alternate Level Control path
- C. automatically tripped;
31EO-EOP-010-2, "RC" (Non-ATWS) flow chart, RC/L path
- D. automatically tripped;
31EO-EOP-015-2, "CP-1" flow chart, Alternate Level Control path

Description:

E11-RHR-LP-00701 "Residual Heat Removal System" states when an RHR pump has auto started and then the pump is secured, that the white Override light above the pump switch will be illuminated.

EOP-RC-LP-20308 "RPV Control (Non-ATWS)" states if previously operating systems fail to maintain RWL above top of active fuel, then transitioning to CP-1 provides instructions to submerge the core. Also the CP-1 flowchart

- A. **Incorrect** - See description above.
- B. **Correct** - See description above.
- C. **Incorrect** - See description above.
- D. **Incorrect** - See description above.

Reference(s) provided to the student:

None

K/A: 295031G2.2.44 Reactor Low Water Level

2.2.44 Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.

(CFR: 41.5 / 43.5 / 45.12) IMPORTANCE RO 4.2 SRO 4.4

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

E11-RHR-LP-00701 "Residual Heat Removal System" EO 006.007.a.05

EOP-RC-LP-20308 "RPV Control (Non-ATWS)" EO 201.083.A.02

Reference(s) used to develop this question:

E11-RHR-LP-00701 "Residual Heat Removal System"

EOP-RC-LP-20308 "RPV Control (Non-ATWS)"

31EO-EOP-010-2, "RC" (Non-ATWS) flow chart

31EO-EOP-015-2, "CP-1" flow chart

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92. 400000A2.02 001/2/1/RBCCW/NEW/HIGHER/HT2009-302/SRO/ARB/CME

Unit 2 is operating at 100% power, when an event caused the following annunciators/conditions to exist:

- o RBCCW SURGE TK LEVEL LOW OR EXCESS LEAKAGE, (650-248)
- o RBCCW HX OUTLET TEMP HIGH, (650-249)
- o RBCCW PUMPS DISCH PRESS LOW, (650-239)
- o 2P42-R601, RBCCW Pump Disch Press Indicator - 85 psig

A Systems Operator reports that the RBCCW surge tank sightglass is empty and the make-up valve is full open.

Which ONE of the following predicts the impact on the RBCCW system standby pump and the required procedure actions?

IAW 34AB-P42-001-2, "Loss Of Reactor Building Closed Cooling Water" _____ RBCCW pumps are expected to be running at this time.

If RBCCW suction temperature reaches 105°F, the Shift Supervisor will direct the operator to enter _____ .

A. two (2);

34AB-C71-001-2, "Scram Procedure", and scram the Reactor

AND

34SO-B31-001-2, "Reactor Recirculation System and trip the Recirc Pumps

B. two (2);

34AB-C71-001-2, "Scram Procedure", (ONLY) and scram the Reactor

C✓ three (3);

34AB-C71-001-2, "Scram Procedure", and scram the Reactor

AND

34SO-B31-001-2, "Reactor Recirculation System", and trip the Recirc Pumps

D. three (3);

34AB-C71-001-2, "Scram Procedure", (ONLY) and scram the Reactor

Description:

34AB-P42-001-2, "Loss Of Reactor Building Closed Cooling Water" states that the standby RBCCW pump will automatically start at 90 psig, which is the setpoint for alarm (650-239).

Two pumps are normally running.

Step 4.8 requires, at 105 deg F, the SS will direct a reactor scram and then trip both reactor recirc pumps .

- A. **Incorrect** - See description above.
- B. **Incorrect** - See description above.
- C. **Incorrect** - See description above.
- D. **Correct** - See description above.

Reference(s) provided to the student:

None

K/A: 400000A2.02 Component Cooling Water

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

A2.02 High/low surge tank level 2.8 3.0

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

P42-RBCCW-LP-00901, "Reactor Building Closed Cooling Water", EO 200.014.A.04

Reference(s) used to develop this question:

P42-RBCCW-LP-00901, "Reactor Building Closed Cooling Water"
34AB-P42-001-2, "Loss Of Reactor Building Closed Cooling Water"
34AR-650-239-2 "RBCCW PUMPS DISCH PRESS LOW"

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93. 700000A2.03 001/1/1/DEGRADED GRID/NEW/HIGHER/HT2009-302/SRO/ARB/CME

At 1200 the Northern Control Center (NCC) notified the Control Room Operator that the 230KV Bus voltage cannot be maintained above the normal minimum voltage.

The following parameters currently exist on **Unit 2**:

- o Main Generator H₂ pressure 43 psig
- o Main Generator Megawatt 860 MWe
- o Main Generator Megavar +280 MVar

- o "2E" 4160 V Emergency Bus volts 3820 volts
- o "2F" 4160 V Emergency Bus volts 3820 volts
- o "2G" 4160 V Emergency Bus volts 3815 volts

Which ONE of the following completes BOTH of these statements?

The Unit 2 Main Generator is operating _____ the acceptable limits of the generator capability curve.

If 4160 V Emergency Bus voltages remain at their present values, IAW 34AB-S11-001-0, "Operation With Degraded System Voltage", a MINIMUM of _____ **Unit 2** 4160 V Emergency Bus(es) is (are) required to be supplied from an Emergency Power source.

REFERENCE PROVIDED

- A. within;
one

- B. within;
two

- C. outside;
one

- D. outside;
two

Description:

Plotting 43 psig & 860 MWe on Attachment 1 "Generator Capability Curve" of 34SO-N40-001-2, "Main Generator Operation" results in operation outside the acceptable limits.

IAW 34AB-S11-001-0, "Operation With Degraded System Voltage" step 4.3.3 places only the "2E" 4160 V Emergency Bus on its emergency power source. This procedure will align one emergency bus to its emergency power source for both units, therefore having two as a distractor is plausible.

- A. **Incorrect** - See description above.
- B. **Incorrect** - See description above.
- C. **Correct** - See description above.
- D. **Incorrect** - See description above.

Reference(s) provided to the student:

34SO-N40-001-2 Attachment 1 "Generator Capability Curve"

K/A: 700000A2.03 Generator Voltage and Electric Grid Disturbances

AA2. Ability to determine and/or interpret the following as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES:
(CFR: 41.5 and 43.5 / 45.5, 45.7, and 45.8)

AA2.03 Generator current outside the capability curve 3.5 3.6

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

S11-LP-02706, "Basic Grid Concepts", EO 200.016.A.04

Reference(s) used to develop this question:

34SO-N40-001-2, "Main Generator Operation"
S11-LP-02706, "Basic Grid Concepts"
34AB-S11-001-0, "Operation With Degraded System Voltage"

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94. G2.1.28 001/3//EAL/MODIFIED/HIGHER/HT2009-302/SRO/ARB/CME

Unit 2 was operating at 100% reactor power with 2E11-F017A, "RHR Outbd Injection Valve" tagged in "Close" for repair. The following occurs:

- o "2C" Main Steam Line breaks in the Steam Chase
- o 2B21-F022C and 2B21-F028C, "Inboard & Outboard Isolation Valves" are stuck "OPEN"
- o A partial loss of High pressure feedwater. Only RCIC is available for injection.

Currently:

- o Compensated RWL is -160" and is stable
- o Un-compensated RWL is -170"
- o 2E11-S17A, "Containment Spray Vlv", switch position is "RESET"
- o 2E11-S18A, Cnmt Spray Vlv Cntl 2/3 Core Ht Permissive", switch position is "OFF"

Which ONE of the following completes both of these statements?

IAW 34SO-E11-010-2, "RHR SYSTEM," in order to place the "A" Loop of RHR in Torus Cooling, the interlock override switch(es) that MUST be manipulated is (are) _____ .

IAW 73EP-EIP-001-0, "Emergency Classifications and Initial Actions," the MOST SEVERE Emergency that the Shift Manager is required to declare is a _____ Emergency.

REFERENCE PROVIDED

- A. 2E11-S17A ONLY
General
- B. 2E11-S17A ONLY
Site Area
- C. 2E11-S17A and 2E11-S18A
General
- D. 2E11-S17A and 2E11-S18A
Site Area

Description:

34SO-E11-010-2, "RHR SYSTEM", section 7.2.5 "Suppression Pool Cooling Mode" states if a LOCA signal is present, then place 2E11-S17A in the "MAN" position. 2E11-S18A will only be manipulated if RWL is below -193" (uncompensated). Plausible for both switches if the candidate thinks since RWL is below TAF that both switches must be manipulated.

73EP-EIP-001-0, "Emergency Classifications and Initial Actions," Attachment 1 - Fission" Product Barrier Evaluation Chart - Modes 1-2-3" indicates with RWL less than -155" along with failure of both valves in any one line to close and downstream breach outside Primary Containment that a "General" emergency exists. Plausible for Site Area emergency if candidate does not consider both key parameters (RWL & unisolable break).

A. Correct - See description above.

B. Incorrect: - See description above.

C. Incorrect - See description above.

D. Incorrect: - See description above.

Reference(s) provided to the student:

73EP-EIP-001-0, "Emergency Classifications and Initial Actions," Attachment 1 - Fission" Product Barrier Evaluation Chart - Modes 1-2-3"

K/A: 2.1. 28

Knowledge of the purpose and function of major system components and controls.

LESSON PLAN/OBJECTIVE:

E11-RHR-LP-00701, "RHR System" EO 007.003.A.03
EP-LP-20101, "Initial/Terminating Activities", TO 001.017.A

Reference(s) used to develop this question:

73EP-EIP-001-0, "Emergency Classifications and Initial Actions," Attachment 1 - Fission"
Product Barrier Evaluation Chart - Modes 1-2-3"
34SO-E11-010-2, "RHR SYSTEM"
E11-RHR-LP-00701, "RHR System"
EP-LP-20101, "Initial/Terminating Activities"

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95. G2.1.37 001/3//REACTIVITY MANAGEMEN/NEW/FUND/HT2009-302/SRO/ARB/CME

Unit 1 is starting up from a scheduled Refueling outage. Control rod movement is in progress to raise reactor power to 5% power. The Shift Manager and the Shift Technical Advisor, along with the following, are in the main control room:

Unit 1	Unit 2
<ul style="list-style-type: none">o Shift Supervisoro Reactivity Management SROo 3 NPOs	<ul style="list-style-type: none">Shift Supervisor1 NPO

Which ONE of the following completes both of these statements?

IAW with 30AC-OPS-003-0, "Plant Operations" and NMP-OS-001, "Reactivity Management Program" the number of NPOs on **Unit 1** _____ meet the minimum required.

Any changes to the **Unit 1** reactivity plan must be approved by the _____ .

- A. does;
Reactivity Management SRO
- B. does;
Shift Supervisor
- C. does NOT;
Reactivity Management SRO
- D. does NOT;
Shift Supervisor

Description:

30AC-OPS-003-0, "Plant Operations" section 8.3, requires at least two licensed NPOs in the MCR for each reactor in the process of startup, scheduled reactor shutdown, rapid power reduction, and during recovery from reactor trips caused by transients or emergencies. In this question, Unit 1 is moving control rods to increase reactor power, therefore the 3 NPOs meet this requirement.

NMP-OS-001, "Reactivity Management Program" section 6.4 states "While the reactivity management SRO provides direct oversight of the planned reactivity additions, the SS must approve the reactivity plan as well as any changes to the plan."

- A. **Incorrect** - See description above.
- B. **Correct** - See description above.
- C. **Incorrect** - See description above.
- D. **Incorrect** - See description above.

Reference(s) provided to the student:

None

K/A: 2.1. 37

Knowledge of procedures, guidelines, or limitations associated with reactivity management.

SRO only because of link to 10CFR55.43 (6): Procedures and limitations involved in initial core loading, alterations in core configuration, control rod programming, and determination of various internal and external effects on core reactivity.

LESSON PLAN/OBJECTIVE:

Reference(s) used to develop this question:

30AC-OPS-003-0, "Plant Operations" section 8.3
NMP-OS-001, "Reactivity Management Program" section 6.4

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96. G2.2.01S 001/3//STARTUP PREPS/NEW/HIGHER/HT2009-302/SRO/ARB/CME

Unit 2 is in Mode 3 making preparations to commence control rod withdrawal. The Reactor Mode switch has just been placed in the "Startup" position.

- o All control rods are fully inserted.
- o The "A" SRM is inop/bypassed for module drawer replacement.
- o An operator informs you that the "B" SRM is indicating 0 cps (downscale).

I&C reports it will be 24 hours to repair either "A" or "B" SRM.

Which ONE of the following completes both of these statements?

IAW with 34GO-OPS-001-2, "Plant Startup" and Tech Specs, all operable SRM channels must be indicating a MINIMUM of _____ cps.

When I&C completes the repairs on either the "A" or "B" SRM, the reactor mode switch will be in the _____ position.

REFERENCE PROVIDED

- A. 3;
Startup
- B. 5;
Startup
- C. 3;
Shutdown
- D. 5;
Shutdown

Description:

TS SR 3.3.1.2.4. requires ≥ 3 cps.

With two SRMs inop, Condition A is entered with a Required Action to restore one of the SRMs within 4 hours. If not restored in 4 hours Condition C is entered to be in mode 3 in 12 hours. This is 16 hours total and the SRMs will not be fixed for 24 hours.

5 cps might be selected because it is the SRM downscale setpoint.

Startup would be selected if the candidate thought: IRMs are on Range 2 (0 SRMS required), or if confused with the requirements of Modes 3, 4 or 5 (2 SRMs required).

- A. **Incorrect** - See description above.
- B. **Incorrect** - See description above.
- C. **Correct** - See description above.
- D. **Incorrect** - See description above.

Reference(s) provided to the student

TS 3.3.1.2, "SRM Instrumentation" WITHOUT Surveillance Requirements & Table

K/A: 2.2.01

Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

C51-SRM-LP-01201, "Source Range Monitor" EO 300.010.A.34

Reference(s) used to develop this question:

34GO-OPS-001-2, "Plant Startup" section 7.1 "Preparations"
TS 3.3.1.2, "SRM Instrumentation"
TS SR 3.3.1.2.4
C51-SRM-LP-01201, "Source Range Monitor"

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97. G2.2.23 001/3//TECH SPEC TRACKING/MODIFIED/FUND/HT2009-302/SRO/ARB/CME

IAW with 31GO-OPS-006-0, "Conditions, Required Actions and Completion Times", which ONE of the following completes following statement.

If plant equipment becomes inoperable when the equipment is not presently required to be operable then a(an) _____ Required Action Sheet will be written and the Shift Supervisor and Shift Manager will _____ the appropriate TSA ACTIVE box below.

SS SIGN / TSA ACTIVE	SOS SIGN
----------------------	----------

- A. Tracking;
initial
- B. Active;
sign
- C. Active;
initial
- D. Tracking;
sign

Description:

31GO-OPS-006-0, "Conditions, Required Actions and Completion Times" Section 7.1, "Initiation Of A Required Action Sheet " step 7.1.1.5 directs you to Section 7.3 for initiating a Required Action Sheet when a SSC is inoperable in a condition when it is not required to be operable. SS & SM signatures makes a RAS active.

Section 7.3 (Tracking RAS) directs the SS & SM to initial the appropriate boxes of the form OPS-1349. This will make the RAS a Tracking RAS.

- A. **Correct** - See description above.
- B. **Incorrect** - See description above.
- C. **Incorrect** - See description above.
- D. **Incorrect** - See description above.

Reference(s) provided to the student:

None

K/A: 2.2.23

Ability to track Technical Specification limiting conditions for operations.

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

LT-LP-30006, "LCO/RAS TRACKING" EO 300.027.A.03

Reference(s) used to develop this question:

31GO-OPS-006-0, "Conditions, Required Actions and Completion Times"

LT-LP-30006, "LCO/RAS TRACKING"

OPS-1349, "REQUIRED ACTION SHEET"

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98. G2.3.13S 001/3//RAD ADMIN/NRC 2009/FUND/HT2009-302/SRO/ARB/CME

Which ONE of the following choices answers both of these statements IAW with the requirements of 73EP-RAD-001-0, "Radiological Event"?

When an Area Radiation Monitor (ARM) UNEXPECTEDLY alarms and radiation levels in the vicinity of the monitor have risen to AT LEAST greater than _____ times normal, then a Plant Page Announcement is required.

The _____ is the MINIMUM level of qualification necessary to declare a Radiological Event AND will make immediate decisions concerning Emergency Call List notifications.

- A. 10
Shift Manager
- B. 10
Control Room Shift Supervisor
- C. 2
Shift Manager
- D. 2
Control Room Shift Supervisor

73EP-RAD-001-0, Section 6.0, states:

The Control Room **Shift Supervisor**, normally in consultation with HP Supervision, must have determined it to be prudent to alert plant personnel to an unusual radiological condition. Such conditions include, but are not limited to the following:

An Area Radiation Monitor (ARM) UNEXPECTEDLY alarms indicating radiation levels in the vicinity of the monitor of greater than **10** times normal but NOT sufficiently high to require an emergency declaration of an ALERT or higher (refer to 73EP-EIP-001-0, sections 2.0 and 19.0).

Reference(s) provided to the student:

None

K/A: 2.3.13

Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

SRO only because of link to 10CFR55.43 (4): Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.

LESSON PLAN/OBJECTIVE:

LT-LP-30001, "Offsite Dose Calculation Manual" TO 200.051.A

Reference(s) used to develop this question:

73EP-RAD-001-0, "Radiological Event"
LT-LP-30001, "Offsite Dose Calculation Manual"
2009 NRC EXAM Q#98

IAW 73EP-EIP-004-0, "Duties Of Emergency Director", which ONE of the following completes both of these statements?

"Initially, the Emergency Director position is filled by the Shift Manager (SM). If the SM is unavailable, then the _____ unit's Shift Supervisor (SS) will become the Emergency Director.

If the SM is unavailable and the event involves BOTH units, the _____ Shift Supervisor (SS) will become the Emergency Director."

- A. affected;
Unit 1
- B. affected;
Unit 2
- C. Non-affected;
Unit 1
- D. Non-affected;
Unit 2

Description:

73EP-EIP-004-0, "Duties Of Emergency Director", states at step 7.1 "Initially, the Emergency Director position is filled by the Shift Manager (SM). If the SM is unavailable, then the affected unit's Shift Supervisor (SS) will become the Emergency Director. IF the SM is unavailable and the event involves both units, the Unit 1 Shift Supervisor (SS) will become the Emergency Director."

- A. **Correct** - See description above.
- B. **Incorrect** - See description above.
- C. **Incorrect** - See description above.
- D. **Incorrect** - See description above.

Reference(s) provided to the student:

None

K/A: 2.4.37

Knowledge of the lines of authority during implementation of the emergency plan.

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

EP-LP-201001, "Initial / Terminating Activities"

Reference(s) used to develop this question:

73EP-EIP-004-0, "Duties Of Emergency Director"

EP-LP-201001, "Initial / Terminating Activities"

HLT 5 NRC EXAM 2009-302

100. G2.4.41 001/3//EAL/MODIFIED/HIGHER/HT2009-302/SRO/FNF/CME

Unit 1 is at 100% power when the following sequence of events occurs:

- o 1100 1B EDG tagged for repairs
- o 1130 Offsite power is lost to Unit 1 ONLY
- o 1130 All operable EDGs start and tie to their associated Emergency Busses.
- o 1135 SO reports 1A EDG Jacket Water Temp of 200°F, rising 0.5°F/min
- o 1145 1C EDG trips on Differential Lockout
- o 1205 Current Time

Which ONE of the choices below completes the following statement?

The HIGHEST emergency classification reached during the event is a(n) _____ and once formal declaration of the event is made the maximum amount of time allowed to make initial notification to State and local governments is _____ .

REFERENCE PROVIDED

- A. Alert;
15 minutes
- B. Alert;
30 minutes
- C. Site Area Emergency;
15 minutes
- D. Site Area Emergency;
30 minutes

Description:

Correct Answer: A

Unit 1 has lost off-site power. The 1A EDG would trip on high jacket water temp (205 °F) if it were in test but the trip is not active now. At 11:45 the plant only has the 1A EDG running, 15 minutes later, the plant will already be in an Alert (SA5).

After declaration of event 15 minutes is the requirement to notify State and local government: (30 minutes = 15 minutes to classify and 15 minutes to notify).

The operator would select SAE if he thought the 1A EDG tripped.
The operator would select 30 minutes if he added the times to classify and notify.

- A. Correct - See description above.
- B. Incorrect - See description above.
- C. Incorrect - See description above.
- D. Incorrect - See description above.

Reference(s) provided to the student:

73EP-EIP-001-0, "Emergency Classification & Initial Actions", Attachment 2 "Hot" Initiating Condition Matrix Evaluation Chart, AC Power Section ONLY.

K/A: 2.4. 41

Knowledge of the emergency action level thresholds and classifications.

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure, recalling the action in the body of procedure and when to take the action.

LESSON PLAN/OBJECTIVE:

EP-LP-20101-04, 001.017.A

Reference(s) used to develop this question:

Modified from Brunswick 2008 SRO Exam
73EP-EIP-001-0, "Emergency Classification & Initial Actions", Attachment 2

You have completed the test!