

Final Submittal
MCGUIRE JUNE 2003 EXAM
50-369/2003-301 AND
50-370/2003-301

JUNE 16 - 30, 2003

1. Combined RO/SRO Written Exam with KAs,
Answers, References, and Analysis

1 Pt.

Which one of the following selections correctly matches the reactor trip signals to their limiting accident?

	<u>Reactor Trip Signal</u>	<u>Limiting Accident/Protection</u>
A.	OP Δ T OT Δ T Pzr High Level Pzr Low Pressure	DNB Excessive fuel centerline temperature DNB NC system integrity
B.	OP Δ T OT Δ T Pzr High Level Pzr Low Pressure	Excessive fuel centerline temperature DNB DNB NC system integrity
C.	OP Δ T OT Δ T Pzr High Level Pzr Low Pressure	DNB Excessive fuel centerline temperature NC system integrity DNB
D.	OP Δ T OT Δ T Pzr High Level Pzr Low Pressure	Excessive fuel centerline temperature DNB NC system integrity DNB

Distracter Analysis:

- A. **Incorrect:** OP Δ T and OT Δ T are reversed.
Plausible: PZR low pressure and high level are correct.
- B. **Incorrect:** All are incorrect.
Plausible: Provided for psychometric balance.
- C. **Incorrect:** OP Δ T and OT Δ T are reversed.
Plausible: PZR low pressure and high level are correct.
- D. **Correct:**

Level: RO

KA: SYS 012 K5.01(3.3/3.8)

Lesson Plan Objective: OP-MC-IC-IPE Obj. 2

Source: Bank

Level of knowledge: Memory

References:

1. OP-MC-IC-IPE pages 19, 45 & 81

1 Pt

Given the following conditions:

- Unit 1 has experienced a large break LOCA
- 30 minutes have elapsed since the LOCA
- FWST Lo Lo level annunciator has just alarmed

Which one (1) of the following describes the operator actions for the alignment of the containment spray system after a LOCA?

- A. Reset Containment Spray and Phase 'B' and stop NS pumps within 45 seconds and manually swap the pump alignment to take suction on the containment sump.**
- B. Reset Containment Spray and the NS pumps will automatically swap over to take a suction on the containment sump when FWST level reaches 33".**
- C. Reset Containment Spray and Phase 'B' and stop the NS pumps within 45 seconds when FWST level reaches 33" and initiate containment spray flow from the ND system.**
- D. Reset Containment Spray and stop the NS pumps within 45 seconds when FWST level reaches 33" and manually swap the pump alignment to take suction on the containment sump.**

MISCINFO: RO**SOURCE:** BANK**LEVEL OF KNOWLEDGE:** Memory

REFERENCES: OP-MC-ECC-NS 3.2 page 31
EP1/A/5000/FR-Z.1 4,d,2 page 5
EP1/A/5000/ES-1.3

LESSON: OP-MC-ECC-NS**OBJECTIVE:** 6, 8

K/A: 026000 K401 (3.1/3.6)
G 2.4.50 (3.3/3.3)

1 Pt.

A large break LOCA is in progress and the operators are responding in FR-Z.1 (Response to High Containment Pressure). Given the following conditions:

- ND pump 1A is tagged out of service for maintenance.
- Containment pressure is 14 psig.
- FWST level reaches the swap-over setpoint.

When shifting to cold leg recirc using ES-1.3 (Transfer to Cold Leg Recirc), valve 1NJ-184B (RB Sump to Train 1B ND & NS) fails to open. The operators implement ECA-1.1 (Loss of Emergency Coolant Recirculation).

FR-Z.1 (Response to High Containment Pressure) requires both NS pumps to be in operation. ECA-1.1 limits the operators to only one NS pump in step 6. Which of these two procedures takes priority under these conditions and what is the basis for this requirement?

- A. **FR-Z.1 takes priority because a total loss of ND causes the NS system to become relatively more important to reduce containment pressure.**
- B. **FR-Z.1 takes priority because it was implemented in response to a red path and FRPs always have priority over ECA procedures.**
- C. **ECA-1.1 takes priority because it conserves FWST water level as long as possible for injection while providing sufficient NS flow to mitigate containment pressure.**
- D. **ECA-1.1 takes priority because ECA procedures always have priority over FRPs.**

Distracter Analysis:

- A. **Incorrect:** ECA-1.1 takes priority over FR-Z.1
Plausible: Although a loss of ND and containment sump recirc causes a loss of the containment heat sink, the supply for NS comes from the FWST which will be drawn down until containment sump recirculation can be established.
- B. **Incorrect:** ECA-1.1 takes priority over FR-Z.1
Plausible: FRPs normally take priority over most EOPs
- C. **Correct answer**
- D. **Incorrect:** ECAs do not always have priority over FRPs.
Plausible: Some ECAs take priority e.g. ECA-0.0 has priority over FRPs in that F-0 is not applicable until transition out of ECA-0.0.

1 Pt. Unit 2 was operating at 100% power when an electrical fire started inside the auxiliary building cable spreading room. AP/0/A/5500/45 Plant Fire has been implemented.

Which one of the following describes how the of fire suppression system is actuated inside the cable spreading area and what are the hazards to personnel if they enter this room?

- A. An NLO is dispatched to open a manual deluge valve. An electrical shock hazard exists due to the use of water to combat an electrical fire.
- B. An NLO is dispatched to verify automatic sprinkler system actuation. An electrical shock hazard exists due to the use of water to combat an electrical fire.
- C. An NLO is dispatched to verify automatic Halon system actuation. An asphyxiation hazard exists due to the presence of Halon gas.
- D. An NLO is dispatched to actuate a manual Cardox system. An asphyxiation hazard exists due to the presence of carbon dioxide gas.

Distracter Analysis:

- A. **Correct Answer:**
- B. **Incorrect:** A manual deluge Mulsifyre system is installed
Plausible: an electrical shock hazard exists
- C. **Incorrect:** A manual deluge Mulsifyre system is installed
Plausible: Halon gas is generally used in areas in which electrical fires are the predominant risk because it does not create a shock hazard
- D. **Incorrect:** A manual deluge Mulsifyre system is installed
Plausible: Cardox gas is a personnel hazard – although all the CARDOX systems have been replaced with HALON, the pull switches still say CARDOX in some areas (like the diesel generators)

LEVEL: RO

LEVEL OF KNOWLEDGE: Memory

SOURCE: BANK

KA: 000067 AK3.02 (2.5/3.3)

Lesson Plan: OP-MC-SS-RFY

OBJECTIVE: OP-MC-SS-RFY Obj. 11

REFERENCE: OP-MC-SS-RFY pages 37, 49, 51, 53

Bank Question: 63.1**Answer: D**

1 Pt

Unit 1 is at 12% power with 4 NCPs running during a plant startup when an electrical transient occurs on the 6.9KV busses.

Given the following transient conditions:

<u>Parameter</u>	<u>Electrical Bus</u>			
	<u>TA</u>	<u>TB</u>	<u>TC</u>	<u>TD</u>
Frequency (Hz)	55	60	55	60
Voltage (Volts AC)	6800	6900	6800	6900

Offsite bus-line 1A is supplying TA and TC

Offsite bus-line 1B is supplying TB and TD

Which one of the following describes the immediate plant response to this transient?

- A. No NCP pumps trip and the reactor does NOT trip**
- B. The 1' A 'and 1 'C' NCPs trip and the reactor trips**
- C. All four NCPs trip but the reactor does NOT trip**
- D. All four NCPs trip and the reactor trips**

Level: RO

SOURCE: BANK

Level of Knowledge: Analysis

REFERENCES: OP-MC-PS-NCP pages 29 & 31
OP-MC-IC-IPE pages 47 & 81
OP-MC-EL-EP pages 41 & 43

LESSON: OP-MC-PS-NCP
OP-MC-IC-IPE
OP-MC-EL-EP

OBJECTIVE: OP-MC-PS-NCP Obj. 15
OP-MC-IC-IPE Obj. 10
OP-MC-EL-EP Objs. 23 & 24

K/A: EPE 007 EA1.04 (4.2/4.1)

Ques_63.1.doc

1 Pt

Unit 1 has experienced an ATWS and the operators are performing the immediate action steps of FR-S.1 (Response to Nuclear Power Generation/ATWS).

Given the following malfunctions:

- 1) The reactor is manually tripped
- 2) The turbine fails to trip automatically and manually.

Which one of the following describes the operator's response in FR-S.1 to respond to failure of the turbine to trip?

- A. Place turbine in **EMERGENCY MANUAL** and close governor valves in fast action and close all MSIVs
- B. Place turbine in **MANUAL** and close governor valves in fast action and close all MSIVs
- C. Place turbine in **MANUAL** and close governor valves in fast action and if turbine will not runback then close all MSIVs and MSIV bypass valves
- D. Place turbine in **EMERGENCY MANUAL** and close governor valves in fast action and if turbine will not runback then close all MSIVs and MSIV bypass valves

MISCINFO: RO

SOURCE: BANK - Modified

REFERENCES: EP/1/A/5000/FR-S.1 page 2
OP-MC-EP-FRS page 25

OBJECTIVE: 1) OP-MC-EO-FRS.Obj 4

K/A: 00012 K3.02 (3.2*/3.3)

LEVEL OF KNOWLEDGE:: COMPRHENSION

1 Pt

Given the following plant conditions:

- Unit 1 in Mode 6.
- Reactor Missile Shield removed.
- "Norm-Refuel" Selector Switch in the REFUEL position.
- Fan Mode Selector Switch in the 100% position.
- 1EMF-38 trip 2 alarm.

Which one of the following selections describes the COMPLETE system response by the Containment Purge System?

- A. Supply Fan (1B) will STOP.
Supply Damper will CLOSE.
Exhaust Fan (1B) will STOP.
Exhaust Damper will CLOSE.
Upper Containment Inside Isolation Valves will CLOSE.
Upper Containment Outside Isolation Valves will CLOSE.
Lower Containment Inside Isolation Valves will CLOSE.
Lower Containment Outside Isolation Valves will CLOSE.**
- B. Supply Fans (1A & 1B) will STOP.
Exhaust Fan (1A & 1B) will STOP.
Upper Containment Inside Isolation Valves will CLOSE.
Upper Containment Outside Isolation Valves will CLOSE.**
- C. Supply Fan (1B) will STOP.
Exhaust Fan (1B) will STOP.
Lower Containment Inside Isolation Valves will CLOSE.
Lower Containment Outside Isolation Valves will CLOSE.**
- D. Supply Fans (1A & 1B) will STOP.
Supply Damper will CLOSE.
Exhaust Fan (1A & 1B) will STOP.
Exhaust Damper will CLOSE.
Upper Containment Inside Isolation Valves will CLOSE.
Upper Containment Outside Isolation Valves will CLOSE.
Lower Containment Inside Isolation Valves will CLOSE.
Lower Containment Outside Isolation Valves will CLOSE.**

Distracter Analysis:

- A. Incorrect:
Plausible:**
- B. Incorrect:
Plausible:**
- C. Incorrect:**

Plausible:
D. Correct answer
Plausible:

Level: RO

Source: BANK

Level of Knowledge: Memory

Lesson: OP-MC-CNT-VP

Objective: OP-MC-CNT VP Obj. 3

KA: 029 K4.03 (3.2/3.5)

Bank Question: 162.1

Answer: C

1 Pt

Which ONE (1) of the following Containment Radiation Monitors will initiate containment ventilation isolation as indicated by the corresponding sequence of actions?

- A. EMF-38(H) trip-1 will secure VP and VQ, and shutoff containment sump pumps and incore sump pumps.
- B. EMF-39(L) trip-1 will sound the containment evacuation alarm, and secures VP and VQ.
- C. EMF-40 trip-2 will secure VP and VQ, and shutoff containment sump pumps and incore sump pumps.
- D. EMF-41 trip-2 will secure VP and VQ, and shutoff containment sump pumps and incore sump pumps.

LEVEL: RO

SOURCE: BANK

REFERENCES: OP-MC-WE-EMF page 25

LESSON: OP-MC-WE-EMF

OBJECTIVE: OP-MC-WE-EMF Obj. 3

KA: SYS 103 A301 (3.9/4.2)

1 Pt

Unit 1 was operating at 100% when a pipe break occurred on the 1D S/G steam header. The operators are responding in E-2 (*Faulted Steam Generator Isolation*). The following sequence of events occurred:

- Isolation of the 1D S/G
- PZR level dropped to 0% and was restored to 20%
- NCS pressure is 1900 psig
- Safety Injection has not been reset

What are the correct panel actions for the restoration of power to pressurizer back-up heater bank D?

- A. **Reset safety injection on 1MC-6.**
 Ensure AUTO is selected on the heater mode switch on 1MC-10
 Select CLOSED on the heater breaker switch on 1MC-5 (vertical board)
- B. **Ensure AUTO is selected on the heater mode switch on 1MC-5**
 Select CLOSED on the heater breaker switch on 1MC-10
 Select ON for the heater control switch on 1MC-5
- C. **Select MANUAL on the heater mode switch on 1MC-10**
 Select CLOSED on the heater breaker switch on 1MC-5
 Select ON for the heater control switch on 1MC-10
- D. **Reset safety injection on 1MC-6**
 Select MANUAL on the heater mode switch on 1MC-5
 Select CLOSED on the heater breaker switch on 1MC-10
 Select ON for the heater control switch on 1MC-5

Distracter Analysis: The B/U heater breakers will not close unless the mode selector switch is in MANUAL.

- A. **Incorrect:** insufficient action, SI reset is unnecessary, and mode switch to MANUAL.
 Plausible: if the candidate is not familiar with the interlocks on the PZR heater circuit, the locations are correct.
- B. **Incorrect:** must turn the heater mode switch to MANUAL, and the locations are incorrect.
 Plausible: if the candidate reverses the panel locations and knows that SI reset is unnecessary, it would appear that this is the best answer.
- C. **Correct answer:** Bank D does not require SI reset
- D. **Incorrect:** Not necessary to reset safety injection and wrong locations for SI reset and heater controls.

Plausible: If the candidate does not know the panel locations, this is the right method for Banks A&B (and would work for D) and was correct in the prior version of the question.

Level: RO

KA: SYS 010 G2.1.31 (4.2/3.9)

Lesson Plan Objective: OP-MC-PS-ILE Obj. 11

Source: BANK

Level of knowledge: comprehension

References:

1. OP-MC-PS-IPE page 19

Bank Question: 47.1**Answer: B**

1 Pt

After a loss of all AC power (station blackout), ES 0.2 (*Natural Circulation Cooldown*) is implemented after AC power has been restored.

Given the following conditions:

- 1) NC pumps cannot be restarted.
- 2) Power has been restored to all station AC busses.
- 3) A natural circulation cooldown is in progress.

Step 18 of ES 0.2 requires that the operators maintain subcooling greater than 50 degrees if all CRD fans are running and greater than 100 degrees if less than all CRD fans are running using core exit thermocouples.

What is the EOP basis for these limits?

- A. To prevent degradation of reactor coolant pump seals due to steam.
 - B. To prevent possible void formation in the upper head.
 - C. To collapse any voids formed in the CRD housings.
 - D. To ensure adequate subcooling due to possible degradation of core exit T/Cs accuracy.
-

LEVEL: RO

SOURCE: BANK

LEVEL OF KNOWLEDGE: Comprehension

REFERENCES: EP/1/A/5000/ES0.2 step 18
OP-MC-EP-E0 6.4.18 page 147

LESSON: OP-MC-EP-E0

OBJECTIVE: OP-MC-EP-E0 Obj. 6

K/A: W/E09 EK2.1 (3.2/3.4)

Ques_47.1

1 Pt

Unit 1 was operating at 100% power when a total loss of feedwater occurred. The operators reached Step 7 of FR-H.1 (*Response to Loss of Secondary Heat Sink*), which attempts to establish CA flow to at least one S/G. Sub-step 7.k states:

Maintain feed flow rate less than or equal to 100 GPM until S/G WR level is greater than 12% (17% ACC).

Given the following conditions:

	<u>Loop A</u>	<u>Loop B</u>	<u>Loop C</u>	<u>Loop D</u>
S/G (WR) [%]	0	15	9	10
NC T _{Hot} [°F]	150	555	530	545

- Containment pressure is 3.4 psig
- The TD CA pump is available to feed the S/Gs

Which one of the following statements correctly describes the bases for the restrictions for restoring feedwater flow following feed and bleed in FR-H.1?

- Restore flow to the 'A' S/G because loop 'A' T-hot is the lowest of the loops and this will reduce the chance of thermal shocking the S/G. Flow should not be restored to the 'B' and 'C' S/Gs because they will be reserved for use later to provide a steam supply for the TD CA pump.
- Restore flow to the 'B' S/G because 'B' S/G level is the highest and this will reduce the chance of thermal shocking the S/G. Flow should be preferentially restored to the 'B' or 'C' S/G to maintain the TD CA pump steam supply.
- Restore flow to the 'C' S/G because loop 'C' T-hot is less than loop 'B' T-hot and this will reduce the chance of thermal shocking the S/G. Flow should be preferentially restored to the 'B' or 'C' S/G to maintain the TD CA pump steam supply.
- Restore flow to the 'D' S/G because the 'D' S/G is higher than 'A' S/G level, which will reduce the risk of thermal shock. Flow should not be restored to the 'B' and 'C' S/Gs because they will be reserved for use later to provide a steam supply for the TD CA pump.

Distracter Analysis: The guidance is to select the S/G that has the highest apparent level and to preferentially select the B or C S/G.

- A. Incorrect:** T-hot should not be used to determine which S/G should receive flow. It is not a reliable means of determining S/G shell temp in a dry stagnant loop.
Plausible: The apparent temp of the A loop is the lowest and it may appear that the chance of thermal shock is lessened.
- B. Correct answer:** feed the S/G that has the highest level and preferentially feed B & C S/Gs to maintain steam supply to the TD CA pump.
- C. Incorrect:** C S/G has a lower S/G level than B S/G
Plausible: C S/G has a lower T-hot than B S/G
- D. Incorrect:** No basis for reserving the B & C S/Gs for restoring flow
Plausible: There is a high probability that restoring feed to a dry S/G could rupture the tube sheet due to thermal stress. It makes sense to select a S/G that is NOT used to supply steam to the TD CA pump for the initial restoration of the heat sink.

Level: RO

KA: W/E05 2.4.18 (2.7/3.6)

Level of Knowledge: Analysis

Lesson Plan Objective: OP-MC-EP-FRH, Obj.4

Source: BANK

References:

1. EP/FR-H.1, Step 7.k (NOTE prior)

1 Pt

Unit 1 was conducting a plant start up. At 1% power, an instrument malfunction caused an inadvertent reactor trip. Given the following indications:

- Two rod bottom lights are NOT lit
- Reactor trip and bypass breakers are open
- IR amps = 2×10^{-8}
- IR SUR = -0.3 DPM

Which one of the following response actions is required?

- A. Implement AP/14, (*Control Rod Misalignment*) and respond to the stuck rods.
- B. Implement E-0, (*Reactor Trip or Safety Injection*), and immediately transition to FR-S.2, (*Response to Loss of Core Shutdown*).
- C. Implement E-0, (*Reactor Trip or Safety Injection*) and immediately transition to FR-S.1, (*Response to Nuclear Power Generation/ATWS*).
- D. Implement E-0, (*Reactor Trip or Safety Injection*), and then transition to ES-0.1, (*Reactor Trip Response*).

Distracter Analysis: The RNO will evaluate the need to transition to FR-S.1 based on indications of reactor criticality. Transition is not appropriate unless reactor power is > 5% and not decreasing.

- A. **Incorrect:** If above P-11 (1955 psig) must use E-0.
Plausible: This would be the correct answer for a reactor trip below P-11.
- B. **Incorrect:** There is no yellow path because SUR < -0.2dpm. In addition, F-0 is not in effect at this point in the procedure
Plausible: This would be the correct response if SUR > -0.2 dpm.
- C. **Incorrect:** inappropriate to enter FR-S.1 because the reactor is subcritical and F-0 is not in effect
Plausible: If the candidate makes a literal reading of E-0 without knowledge of the ERG background positions on what constitutes a tripped reactor. Some plants enter FR-S.1 for two rods stuck out.
- D. **Correct:**

Level: RO

KA: W/E 01 EK1.2 (3.4/4.0)

Lesson Plan Objective: EP-EO Obj. 10

Source: BANK

Level of knowledge: Memory

References:

1. OP-MC-IC-IRE page 35
2. OP-MC-EP-FRS page 15, 17
3. OP-MC-EP-E0 pages 19, 27
4. F-0 page 1
5. E-0 page 3
6. AP-14 page 2

Bank Question: 228.1

Answer: B

- 1 Pt Unit 1 is in mode 6 and in the process of unlatching control rods. Which ONE (1) of the following limiting conditions requires immediately suspending all CORE ALTERATIONS in the Reactor Building?
- A. Loss of one channel of SR NIs with both Gamma Metric SDMs in operation.
 - B. Loss of direct communications between the control room and the refueling bridge (refueling station).
 - C. Loss of the Fuel Handling Ventilation System.
 - D. Time since entering mode 2 is 102 hours.
-

LEVEL: RO

SOURCE: BANK

LEVEL OF KNOWLEDGE: Memory

REFERENCES: SLC 16.9.18
 OP-MC-FH-FC pages 11, 27, 33
 Tech Spec 3.9.3

LESSON: OP-MC-FH-FC

OBJECTIVE: OP-MC-FH-FC Objs. 1 & 7

KA: G 2.2.27 (2.6/3.5)

Bank Question: 311.2**Answer: A**

1 Pt

Unit 1 is operating at 50% power. Given the following conditions:

- Pressurizer pressure is 2235 psig
- Pressurizer Relief Tank (PRT) pressure is 20 psig
- PRT temperature is 125 °F
- PRT level is 81%
- The PRT is being cooled by spraying from the RMWST
- A pressurizer code safety valve is suspected of leaking by its seat

What temperature would be indicated on the associated safety valve discharge RTD if the code safety were leaking by?

REFERENCES PROVIDED: Steam Tables

- A. 258-262 °F
- B. 227-231 °F
- C. 161-165 °F
- D. 123 -127°F

Distracter Analysis:

- A. **Correct answer**
- B. **Incorrect:** Temp is too low - the correct temp is 260 °F
Plausible: If the candidate makes the mistake of not correcting for atmospheric pressure by failing to adding 14.6 psi to the PRT pressure and uses 20 psia.
- C. **Incorrect:** Temp is too low - the correct temp is 260 °F
Plausible: If the candidate reverses the correction for atmospheric pressure by subtracting 14.6 psi from PRT pressure of 20 psig to get 5 psia.
- D. **Incorrect:** Temp is too low - the correct temp is 260 °F
Plausible: If the candidate thinks that the discharge temperature will be at the same temperature as the PRT fluid.

Level: RO**KA:** SYS 010 K5.02 (2.6/3.0*)**Source:** BANK**Level of Knowledge:** Analysis**Objective:** OP-MC-THF-EB Obj. 8

Reference: OP-MC-THF-EB pages 23-26

1 Pt

In E-3 (Steam Generator Tube Rupture) Enclosure 5 (NC Pressure and Makeup Control to Minimize Leakage) the operators are directed to energize pressurizer heaters if the ruptured S/G level is decreasing and pressurizer level is greater than 25%.

What is the purpose for this action?

- A. **Maintain pressurizer saturation temperature corresponding to ruptured S/G pressure to minimize S/G leakage into the NC system.**
- B. **Maintain pressurizer saturation temperature corresponding to intact S/G pressure to minimize primary leakage into the S/G.**
- C. **Maintain pressurizer saturation temperature above the corresponding ruptured S/G pressure to ensure S/G water does not flow into the NC system.**
- D. **Maintain pressurizer saturation temperature corresponding to intact S/G pressure to minimize NC pressure transients.**

Distracter Analysis: The purpose of this question is to determine if the candidate understands that thermal hydraulic equilibrium (temp/press/leak rate) needs to be established between the NCS and the ruptured S/G. No references are provided because the candidate should be able to answer the question by simply comprehending the pressures and reasons for this equilibrium.

- A. **Correct Answer:**
- B. **Incorrect:** required to maintain NCS pressure equal to ruptured S/G pressure, not the intact S/G - Intact S/G pressure < ruptured S/G pressure would not reduce NCS to S/G leakage
Plausible: if the candidate is confused over the thermal hydraulics
- C. **Incorrect:** required to maintain NCS pressure equal to ruptured S/G pressure
Plausible: partially correct – do not want leakage from S/G to NCS or NCS to S/G
- D. **Incorrect:** required to maintain NCS pressure equal to ruptured S/G pressure, not the intact S/G
Plausible: this would be a reasonable basis for monitoring intact S/G pressure if that were the correct answer.

Level: RO

KA: EPE 038 EK1.02(3.2/3.5)

Lesson Plan Objective: OP-MC-EP-EP3 Obj 4

Source: Bank

Level of knowledge: comprehension

References:

1. OP-MC-EP-EP3 pages 19, 101, 119
2. EP/1/A/5000/E-3 pages 56, 57

1 Pt

During a cold startup, the NCPs are limited to 3 consecutive starts in any 2-hour period. There is an additional requirement of a minimum idle period of 60 minutes between restarts. What is the reason for these limitations?

- A. This restriction assures that the NCP oil temperature will decrease to design specifications between restart attempts.
- B. This restriction prevents overheating the motor windings due to high starting currents.
- C. This restriction allows the NCP seals to fully reseal between NCP oil lift pump cycles.
- D. This restriction ensures adequate Number 1 Seal Leakoff flow.

Distracter Analysis:

- A. **Incorrect:** The reason is stator-winding temperatures
Plausible: if the candidate remembers this as a high temperature concern - another adverse consequence of multiple starts on motors
- B. **Correct Answer:**
- C. **Incorrect:** The reason is stator-winding temperatures
Plausible: NCP seal seating is the basis for a different cold start precaution – seal leakoff limit after seal replacement
- D. **Incorrect:** The reason is stator-winding temperatures
Plausible: if the candidate is confused regarding the basis for the precaution.

Level: RO**Source:** BANK**Level of Knowledge:** Memory**KA:** G2.1.32 (3.4/3.8)**References:**

1. OP-MC-PS-NCP page 35

Bank Question: 359.3**Answer: D**

1 Pt

Unit 1 is responding to a small break LOCA using E-1 (*Loss of Reactor or Secondary Coolant*). Given the following events and conditions:

- FWST Level = 340 inches
- Containment pressure = 1.5 psig
- Containment Sump Level = 1.05 ft
- EMF-41 (*AUX BLDG VENTILATION*) = trip 2
- Aux Building area radiation monitors are in alarm
- EMF-51A and B (*CONTAINMENT TRN A & B*) = 25 R/Hr
- Hydrogen Analyzer = 0.7% in containment
- NLO's report significant leakage at the seals of the 1A ND pump

Which one of the following procedures should the operator transition into from E-1?

- A. **FR-Z.3 (*Response to High Containment Radiation Level*)**
- B. **ECA-1.1 (*Loss of Emergency Coolant Recirculation*)**
- C. **FR-Z.4 (*Response to High Containment Hydrogen*)**
- D. **ECA-1.2 (*LOCA Outside Containment*)**

Distracter Analysis: The initial conditions provide a LOCA into containment and a leakage path outside of containment. The question is which of the problems take priority? The purpose is not to memorize procedure steps but to answer this from a broader perspective.

- A. **Incorrect:** Cont RAD levels < 35 R/hr and this would be a YELLOW path that does NOT require priority action.
Plausible: If the candidate thinks that the abnormal radiation level requires priority action.
- B. **Incorrect:** Still in injection phase of SI – have failed to isolate leak outside containment.
Plausible: if candidate is not familiar with the entry conditions for ECA 1.1 (after failure to isolate leak outside containment).
- C. **Incorrect:** Cont H2 > 0.5 %, but this is a YELLOW path not requiring priority action.
Plausible: If the candidate fails to recognize the leak in the auxiliary bldg and/or the fact that E-1 takes care of the cont H2 problem.
- D. **Correct:**

Level: RO

KA: WE 04EK3.2 (3.4 /4.0)

Lesson Plan Objective: OP-MC-EP-E1 Obj 2

Source: BANK

Level of knowledge: comprehension

References:

1. OP-MC-EP-E1 page 45
2. EP/1/A/5000/E-1 pages 12-14
3. EP/1/A/5000/F-0 page 9

1 Pt

Unit 2 was at 10% during a plant startup when a loss of condenser vacuum occurred. Given the following conditions:

- The reactor was tripped
- The steam dump select switch was in steam pressure mode
- Condenser vacuum dropped to 18 inches
- No component or instrument failures occurred
- No operator action taken

Which one of the following sequences best describes the actuation of the steam dumps to this event?

	<u>Condenser dump valves</u>	<u>Atmospheric dump valves</u>
A.	open	open
B.	open	shut
C.	shut	open
D.	shut	shut

Distracter Analysis:

- A. **Incorrect:** - the condenser dumps will not open due to the C9 arming signal not present caused by a low vacuum condition (20 in) The atmospheric dumps will not open because they do not actuate when the steam dump selector switch is in steam pressure mode
Plausible: - this would occur if the transition had not yet been made to steam pressure mode and C9 had actuated - a normal plant response during a startup < 10% power.
- B. **Incorrect:** - the condenser dumps will not open due to the C9 arming signal not present caused by a low vacuum condition
Plausible: - this sequence would occur if there was not a loss of condenser vacuum or if the candidate does not recognize the interaction between condenser pressure and the C9 arming signal.
- C. **Incorrect:** - the atmospheric dumps will not open because they do not actuate when the steam dump selector switch is in steam pressure mode
Plausible: - this sequence would occur if the plant was in Tave mode above ~55% - the transition from Tave to steam pressure mode occurs by procedure at 10% power
- D. **Correct answer**

Level: RO

KA: APE 051 AK.3.01 (2.8*/3.1*)

Lesson Plan Objective: STM-IDE LPSO 5, 6, 9

Source: Bank

Level of Knowledge: comprehension

References:

1.OP-MC-STM-IDE pages 17-35 (odd only)

1 Pt

Unit 1 has initiated a liquid radioactive waste release from the Ventilation Unit Condensate Drain Tank (VUCDT) through the RC system. All lineups and authorizations have been properly made in accordance with OP/1/A/6500/001 A using the normal path. Two RC pumps are the minimum required under the LWR document.

Given the following initial conditions:

- 3 RC pumps are running
- 1EMF-44 (*CONT VENT DRN TANK OUT*) correctly set for trip 1 and trip 2 activity limits
- No other releases are in progress

If the release automatically terminates 40 seconds after initiation, which one of the following conditions could have terminated the release?

- A. **1WM-46 (*LIQUID WASTE DISCH VALVE*) closing automatically if 2 RC pumps trip**
- B. **1WM-46 closing automatically if 1EMF-44 reached the trip 2 setpoint**
- C. **1WP-35 (*WMT & VUCDT TO RC CNTRL*) closing automatically if 1 RC pump tripped**
- D. **1WP-35 closing automatically if 1EMF-44 reached the trip 2 setpoint**

Distracter Analysis:

- A. **Incorrect:** - RC pump interlock will not actuate - set at 2 pumps (minimum required on LWR document). WM-46 is isolated and not used anymore as a release path.
Plausible: - this was formerly the normal release path
- B. **Incorrect:** - WM-46 receives a closing signal from EMF-44 but this is not the normal path for a release. WM-46 is isolated and not used anymore.
Plausible: - this was formerly the normal release path
- C. **Incorrect:** - RC pump interlock will not actuate - set at 2 pumps (minimum required on LWR document).
Plausible: - if the candidate misunderstands the RC pump interlock--this was the correct answer on a prior NRC exam -
- D. **Correct answer**

Level: RO

KA: G 2.3.11 (2.7/3.2)

Lesson Plan Objective: OP-MC-WE-WL Obj. 3

Source: Bank

Level of knowledge: Comprehension

References:

1. OP-MC-WE-WL pages 21, 23, 27, 59
2. OP-MC-WE-EMF page 31
3. OP-MC-WE-RLR page 11 and 13

Bank Question: 432.3**Answer: A**

1 Pt

Unit 1 has just entered Mode 5 in preparation for refueling. Given the following conditions and events:

- A lower containment entry is planned for the next shift.
- The SRO directs the RO to purge the containment in preparation for the containment entry.
- Currently the VP system is secured with all fans off and containment purge and exhaust valves closed

Which one of the following describes the proper alignment of the containment purge system?

- A. The **NORMAL-REFUEL SELECTOR** switch is placed in the "**NORM**" position and ratio of supply air is 2/1 (Upper/Lower Containment).
- B. The **NORMAL-REFUEL SELECTOR** switch is placed in the "**NORM**" position and ratio of supply air is 4/1 (Upper/Lower Containment).
- C. The **NORMAL-REFUEL SELECTOR** switch is placed in the "**REFUEL**" position and ratio of supply air is 2/1 (Upper/Lower Containment).
- D. The **NORMAL-REFUEL SELECTOR** switch is placed in the "**REFUEL**" position and ratio of supply air is 4/1 (Upper/Lower Containment).

Distracter Analysis:

- A. **Correct:** - this is the proper position for this operation.
- B. **Incorrect:** Air ratio is 2/1 not 4/1
Plausible: -
- C. **Incorrect :** - this will over-pressurize the upper containment
- D. **Incorrect:** - this will over-pressurize the upper containment.
Plausible: .

Level: RO

KA: G 2.3.9 (2.5/3.4)

Lesson Plan Objective: CNT-VP Obj. 2

Source: BANK

Level of knowledge: Comprehension

References:

1. OP-MC-CNT-VP pages 19, 21, 23

1 Pt

Unit 1 is shutdown in a refueling outage. Given the following events and conditions:

- The VI system was in a normal lineup.
- The VS system was in a normal lineup.
- A VI header rupture occurs.
- The VI system completely depressurizes.

What effect does a total loss of the VI system have on the VS system?

- A. **VI-820 will auto-close as VI header pressure decreases below 82 psig and the VS air compressor will start automatically to maintain VS header pressure.**
- B. **VI-820 will auto-close as VI header pressure decreases below 90 psig and the VS air compressor must be manually started to maintain VS header pressure.**
- C. **Check valves in the VI - VS cross-connect line will close to isolate VS system pressure before it drops below 90 psig.**
- D. **VS pressure in the Fire Protection Pressurizer Tank will be lost until a VS air compressor can be started.**

Distracter Analysis:

- A. **Incorrect:** - the VS air compressor does not automatically start to maintain pressure
Plausible: - The VI system is safety significant, VI-820 used to close 82 psig but the setpoint was recently changed from 82 psig to 90 psig. There is a separate VS air compressor, which has an automatic startup feature – but is normally in “off” and requires operator action to start.
- B. **Correct answer**
- C. **Incorrect:** - there are no check valves in this line
Plausible: - this is another possible method to prevent depressurizing the VS header at some plants.
- D. **Incorrect:** - the RF system tank is pressurized with VS air - but is maintained isolated from the VI header
Plausible: - if the candidate does not know that the RF system air tank is isolated from the VS header.

Level: RO

KA: SYS 078 K4.01 (2.7/2.9)

Lesson Plan Objective: SS-MC-SS-VI Obj. 7

Source: Bank

Level of Knowledge: comprehension

References:

1. OP-MC-SS-VI page 115

1 Pt

Unit 2 is operating at 75% power when a load rejection occurs. Which one of the following statements correctly describes the response of 2CM-420 (Load Rej Byp) to this transient?

- A. 2CM-420 closes to prevent condensate water from being diverted to the suction of the hotwell pumps from the condensate booster pumps to assure minimum flow to the CF pumps.
- B. 2CM-420 closes to prevent diversion of water from the "C" heater drain tank back to the UST thereby ensuring sufficient CF pump suction pressure.
- C. 2CM-420 opens to divert condensate flow directly to the condensate booster pump suction to ensure that CF pumps have sufficient suction pressure.
- D. 2CM-420 opens to divert condensate flow, bypassing around the condensate booster pumps, directly to the CF pumps to assure minimum flow requirements.

Distracter Analysis:

- A. **Incorrect:** CM-420 opens - does not close. Does not prevent water from being recirculated around the hotwell pumps.
Plausible: this function is performed by CM-407 – which opens to assure minimum flow around the hotwell pumps to prevent water hammer on the CM system during startup.
- B. **Incorrect:** CM-420 opens - does not close. Does not prevent a loss of water to the condensate booster pump suction.
Plausible: CM-227 opens to recirc condensate from the C feedwater heater to the USTs to assure minimum recirc flow on the CBPs
- C. **Correct answer**
- D. **Incorrect:** CM-420 does not provide a flow path around the condensate booster pumps directly to the CF pumps to meet minimum flow requirements
Plausible: CM-420 opens to provide bypass flow – but directly to the CBPs – not the CF pumps

Level: RO

Level of Knowledge: Memory

Source: BANK

K&A: 056 A2.04 (2.6/2.8*)

Lesson Plan: OP-MC-CF-CM Obj. 11

References: OP-MC-CF-CM page 33 & 67

1 Pt

Unit 1 was operating at 100% power when main condenser vacuum drops from 25 inches vacuum to 23 inches vacuum. Given the following events and conditions:

- All 3 condenser steam air ejectors (CSAEs) are in service
- Both primary and secondary jets are operating
- The system lineup is in the normal configuration

Which one of the following statements correctly describes the cause of this problem?

- A. **Loss of YM supply to the condenser boot seals**
 - B. **Loss of Main Steam to the CSAEs**
 - C. **CM flow to all CSAE inter-coolers has been obstructed**
 - D. **A CSAE drain was left open**
-

Distracter Analysis:

- A. **Incorrect:** A recent change no longer runs seals water to the condenser boot seals.
Plausible: Seal water to the boot seals was originally designed to prevent condenser leakage
- B. **Incorrect:** Main steam does not supply the CSAEs
Plausible: There are physical connections for main steam to be the back up supply for aux steam – but these connections are not used.
- C. **Correct answer** - reduces effectiveness of steam jets and causes vacuum to decrease.
- D. **Incorrect:** CSAE drains are normally open to allow condensate to drain out of the air ejectors.
Plausible: If the drain is left closed, the condensate will build up and flood out the CSAE, which could cause a loss of vacuum. This is the reverse of the distracter.

Level: RO

KA: SYS 055K3.01 (2.5 / 2.7)

Lesson Plan Objective: MT-ZM SEQ 4, 5, 9

Source: Bank

Level of knowledge: comprehension

References:

1. OP-MC-MT-ZM pages 11, 13, 15, 23, 27

1 Pt

Unit 1 was operating in Mode 3 during a plant shut down for a refueling outage. If a safety injection signal is received, which one of the following events will occur to protect the vital AC busses from overload?

- A. **Only non-LOCA loads will be shed. The accelerated sequence will sequence remaining loads on after checking for adequate bus voltage.**
 - B. **A complete load shed will occur. The accelerated sequence will sequence LOCA loads on after checking for adequate bus voltage and DG speed.**
 - C. **A complete load shed will occur. The accelerated sequence will sequence LOCA loads on after checking for adequate bus voltage.**
 - D. **Only non-LOCA loads will be shed. The accelerated sequence will sequence remaining loads on after checking for adequate bus voltage and DG speed.**
-

Distracter Analysis:

- A. **Correct answer**
- B. **Incorrect:** only non-LOCA loads are shed, the accelerated sequence does not check for DG speed during a LOCA
Plausible: DG speed is checked when the sequencer is actuated during a blackout signal
- C. **Incorrect:** only non-LOCA loads are shed
Plausible: the remaining part of the answer is correct
- D. **Incorrect:** the accelerated sequence does not check for DG speed during a LOCA
Plausible: DG speed is checked when the sequencer is actuated during a blackout signal

Level: RO

KA: SYS 013 K4.11(3.2/3.8)

Lesson Plan Objective: DG-EQB Obj 6

Source: Bank;

Level of knowledge: Memory

References:

1. OP-MC-DG-EQB page 25

Bank Question: 593.1**Answer: B**

1 Pt

Unit 2 was operating at 99% power when a steamline break occurred. Given the following events and conditions:

- 0200 The operators enter AP/01 (*Steam Leak*)
- 0200 The operators start reducing turbine load to match T_{ave} and T_{ref}
- 0201 The operators start a second NV pump and isolate letdown
- 0202 NLOs start investigating for the location of the steam leak
- 0203 *P/R OVER POWER ROD STOP* alarms – the RO reports that power is now going down.
- 0204 STA reports pressurizer level is decreasing and cannot be maintained
- 0205 The turbine building operator reports that the line to the atmospheric dump valves has a steam leak and cannot be isolated

If no safety injection has occurred and pressurizer pressure is maintained, which one of the following operator responses is correct?

- A. Manually trip the reactor at 0203
- B. Manually trip the reactor at 0204
- C. Manually trip the reactor at 0205
- D. Commence a rapid down power using AP/04 (*Rapid Downpower*) at 0205

Distracter Analysis:

- A. **Incorrect:** no requirement to trip the reactor because reactor power has turned and is decreasing. Not approaching the overpower automatic reactor trip at 109% in 2 of 4 channels.
Plausible: shows a power mismatch – reactor power reaches 103% on 1 of 4 PR channels to cause C-2. OMP 4-3 (*Use of Abnormal and Emergency Procedures*) requires the operator to trip when an automatic safeguards action setpoint is approached to avoid challenging the automatic safeguards function.
- B. **Correct answer** required to trip under AP/01 (and many other procedures) if you cannot maintain pressurizer level with 2 NV pumps
- C. **Incorrect:** required to trip when PZR level cannot be maintained
Plausible: if the candidate thinks that a reactor trip is required because the steam leak was not isolated.
- D. **Incorrect:** required to trip when PZR level cannot be maintained
Plausible: this would be the correct answer if not required to trip at 0204.

Level: RO

KA: W/E12 EA1.03(3.4/3.9)

Lesson Plan Objective: AP-1 Obj. 4

Source: Bank;

Level of knowledge: comprehension

References:

1. AP/1/A/5500/01 page 3
2. OP-MC-IC-IPE page 45
3. OMP 4-3, page 8

1 Pt

Unit 2 was operating at 90% power after a start-up from a refueling outage. A pressurizer PORV is found to be leaking and the associated PORV block valve was shut. The PRT was cooled down to the following PRT conditions:

- PRT Level – 65%
- PRT Pressure – 9 psig
- PRT Temperature – 100°F
- Lower Containment Temperature - 118 °F

What actions are required to restore and maintain normal operating conditions to the PRT for the long term?

- A. Vent the PRT to the waste gas system.
- B. Vent the PRT to containment.
- C. Cool the PRT by pressurizing with nitrogen and initiating spray flow from the NCDT.
- D. Cool the PRT by initiating spray flow through the sparger line from the RWST

Distracter Analysis: With PRT pressure > 8 psig and temperature < containment temp, cooling the PRT will only result in the PRT heating back up again.

- A. **Correct:**
- B. **Incorrect:** cannot be performed at power as the vent valve is inside containment and is inaccessible at power
Plausible: venting to containment would accomplish the required action
- C. **Incorrect:** Lower Containment temp is 118 °F. Cooling the tank further would only delay the time when it would heat back up again and require further cooling. The PRT can be cooled by pressurizing the PRT with nitrogen - but then spray flow must be initiated from the RMWST not the NCDT.
Plausible: Cooling will reduce pressure temporarily but will not allow the PRT to reheat to its normal limit of 114°F without getting a high-pressure condition (containment temp is 118°F). In addition, recirculating through the NCDT using the NCDT pumps cools the PRT and pressure would be reduced – temporarily.
- D. **Incorrect:** Cannot cool the PRT through the sparger line
Plausible: can cool the PRT by recircling through the RWST – must pressurize with N2 and recirculate RWST water through the spray and drain connections.

Level: RO

KA: SYS 007 A2.02 (2.6/3.2)

Lesson Plan Objective: PS-NC Obj. 20

Source: BANK

Level of knowledge: memory

References:

1. OP-MC-PS-NC pages 41, 43

Bank Question: 891.2

Answer: A

1 Pt

Unit 1 has experienced a rupture of the RN piping inside containment. Emergency procedures prescribe successful response mechanisms if containment water level remains between 3.5 and 10.5 feet.

Why is safe plant recovery not assured for a design basis large break LOCA when containment water level exceeds 10.5 feet?

- A. **Operation of critical ECCS components needed for safe recovery is endangered by submersion.**
- B. **Operation of the NS pumps is endangered by excess debris fouling the containment suction strainers.**
- C. **Operation of the hydrogen purge system is compromised by loss of direct access to the containment atmosphere.**
- D. **Operation of the ND system is compromised by high suction pressure**

Distracter Analysis:

- A. **Correct:** The containment flood plane reference is at 10.5 ft. Submersion beyond this level will expose unqualified components to a hostile environment that they are not qualified for.
- B. **Incorrect:** Submergence beyond the reference flood plane will not cause excess debris nor will it transport debris to the suction strainers, which are at the very bottom of the containment sump. Debris is generated by impingement of high energy releases against containment SSCs – the design basis will prevent excess debris if containment is maintained free of foreign material.
Plausible: Clogged suction strainers could occur if submergence of components was a mechanism, which could lift debris. This is a reason to keep foreign material out of containment.
- C. **Incorrect:** The hydrogen purge system is far above the 10.5 ft flood plane and would not be compromised.
Plausible: If the hydrogen purge system was submerged, it would fail to operate.
- D. **Incorrect:** 10.5 feet of water will not lift the ND suction relief, or if it did the relief returns to the PRT.
Plausible: High containment level increases ND suction pressure.

Level: RO

KA: EPE W/E 15 G2.1.7 (3.7/4.4)

Lesson Plan Objective: EP-MC-EP-

FRZ Obj. 4

Source: BANK

Level of knowledge: Memory

References:

1. OP-MC-EP-FRZ page 47

Bank Question: 895.1

Answer: A

1 Pt

Unit 1 is operating at 100% power. The battery charger 1EDGA for the 1A emergency diesel generator battery has failed and will not provide a DC output.

Which one of the following statements correctly describes the effect on the 1A emergency diesel generator?

- A. The 1A emergency diesel generator will start but not continue to run for its design basis committed time period without the battery charger in service.
- B. The 1A emergency diesel generator will not start without the battery charger in service.
- C. The 1A emergency diesel generator will start and run because the battery charger has a vital DC backup power supply, and will automatically supply the vital loads after starting.
- D. The 1A emergency diesel generator will start and run because all safety grade auxiliary loads are supplied from the 600VAC motor control center supplied from 1ELXA.

Distracter Analysis:

- A. **Correct:** The D/G will start because the D/G battery will supply all starting loads. However, without the charger, the battery will expire and power will be lost to the governor, voltage regulator and other vital DC loads.
- B. **Incorrect:** The D/G will start without the charger – power will be supplied from the D/G battery.
Plausible: if the candidate does not know that removing the inverter does not remove the battery from service. This would be true if the D/G control power breaker was opened.
- C. **Incorrect:** DG is inoperable without the battery charger.
Plausible: Some batteries have this feature.
- D. **Incorrect:** DG is inoperable without the battery charger.
Plausible: The battery will provide power to DG auxiliaries for some period of time – some vital D/G auxiliaries are supplied from the 600 VAC control center.

Level: RO

KA: APE 058 AK1.01 (2.8/3.1*)

Lesson Plan Objective: OP-MC-DG-EPQ Objs. 3, 4, 5, 6, 7

Source: BANK/Modified

Level of knowledge: comprehension

References:

1. OP-MC-DG-EPQ pages 15-19 & 25 odd pages only

1 Pt

A station emergency battery is supplying DC bus loads without a battery charger online. If the load on the DC bus does not change, which one of the following statements correctly describes a vital battery's discharge rate (amps) as the battery is expended?

- A. The discharge rate will be fairly constant until the design battery capacity (amp-hours) is exhausted and then will rapidly decrease.
- B. The discharge rate will decrease at a faster rate until the design battery capacity is exhausted.
- C. The discharge rate will increase at a faster rate until the design battery capacity is exhausted.
- D. The discharge rate will initially decrease until approximately 50% design capacity had been expended and then increase until the battery has been exhausted.

Distracter Analysis:

- A. **Incorrect:** The discharge rate increases.
Plausible: This is a typical response for many design systems - If the candidate does not recall that $V = I \times R$.
- B. **Incorrect:** The discharge rate increases.
Plausible: If the candidate reverses the effect of decreasing voltage on discharge rate.
- C. **Correct:**
- D. **Incorrect:** The discharge rate increases.
Plausible: If the candidate does not understand battery theory.

Level: RO

KA: SYS 063 A1.01 (2.5/3.3)

Lesson Plan Objective: EL-EPL SEQ 12/20

Source: Bank

Level of knowledge: memory

References:

1. OP-MC-EP-EPL pages 65-67

1 Pt

The crew has verified natural circulation in ES-0.1 (*Reactor Trip Response*) based on decreasing core exit thermocouple readings and subcooling > 0 °F. Ten minutes later, the operator notes that the thermocouple input to both plasma displays is malfunctioning.

Which one of the following correctly describes a valid indication that natural circulation is continuing?

- A. **S/G saturation temperatures are decreasing and REACTOR VESSEL UR LEVEL indication is greater than 100 %.**
- B. **S/G pressures are decreasing and T_{cold} is at S/G saturation temperature.**
- C. **S/G pressures are decreasing and REACTOR VESSEL D/P indication is greater than 100%.**
- D. **S/G pressures are decreasing and T_{hot} is at S/G saturation temperature.**

Distracter Analysis:

- A. **Incorrect:** There is no indication of coupling between primary and secondary.
Plausible: These are important indications during natural circulation.
- B. **Correct:**
- C. **Incorrect:** dp range is unavailable during natural circulation.
Plausible: S/G pressure decreases during natural circulation and RVLIS is one of the other plasma display indications.
- D. **Incorrect:** dp range is unavailable during natural circulation.
Plausible: S/G pressure will remain close to saturation for T_{cold} during natural circulation and RVLIS is one of the other plasma display indications.

Level: RO

KA: 0017 A3.01 (3.6*/3.8*)

Lesson Plan Objective: EP-E0 Obj. 6

Source: BANK

Level of knowledge: Memory

References:

1. OP-MC-EP-E0 pages 117, 123
2. ES-0.1 page 15
3. ES-0.1 Enclosure 2 page 31

1 Pt

Unit 2 was operating at 100% when a complete loss of offsite power (LOOP) occurred. All systems were operable and in a normal alignment.

Which one of the following containment ventilation systems will have all operating fans/air handling units stopped after 5 minutes without any offsite power?

- A. VU ventilation units
- B. Pressurizer booster fans
- C. Pipe tunnel booster fans
- D. Steam generator booster fans

Distracter Analysis:

- A. **Incorrect:** VU AHUs and return air fans will start on a LOOP/blackout – they have an emergency power supply.
Plausible: They will not start in a safety injection signal
- B. **Incorrect:** Pressurizer booster fans will start on a LOOP from the B/O sequencer – they have an emergency power supply.
Plausible: If the candidate confuses the emergency power supply for the pressurizer booster fans with the steam generator booster fans
- C. **Incorrect:** Pipe tunnel booster fans will start on a LOOP from the B/O sequencer – they have an emergency power supply.
Plausible: They will not start in a safety injection signal
- D. **Correct:** Steam generator booster fans do not restart on a LOOP - B/O signal – they do not have an emergency power supply

Level: RO

KA: SYS 022 K2.01 (3.0*/3.1)

Lesson Plan Objective: CNT-VUL LPRO 5

Source: Bank

Level of Knowledge: memory

References:

1. OP-MC-CNT-VUL pages 35, 39

1 Pt

Unit 2 was at 75% R.T.P. when a loss of condenser vacuum occurred.
Given the following conditions:

- Rods are in automatic
- The steam dump select switch is selected to 'Tave' mode
- Condenser vacuum is slowly decreasing
- No component or instrument failures occurred
- No operator action taken

Which one of the following sequences best describes the actuation of the control rods to this event?

- A. Control rods move in due to decreased condenser back pressure
- B. Control rods move out due to decreased condenser back pressure
- C. Control rods move in due to increased condenser back pressure
- D. Control rods move out due to increased condenser back pressure

Distracter Analysis:

- A. Incorrect:
Plausible:
- B. Incorrect: -
Plausible:.
- C. Incorrect:
Plausible: -
- D. Correct

Level: RO

KA: APE 000051 AA1.04 (2.5*/2.5*)

Lesson Plan Objective: OP-MC-STM-IDE Obj. 9

Source: Bank

Level of Knowledge: Comprehension

References:

1.OP-MC-STM-IDE pages 17-33 (odd only)

1 Pt Unit 1 is responding to a LOCA from a trip at full power. Given the following events and conditions:

- A safety injection occurred at 0200.
- FWST level reaches 33 in. at 0246.
- S/I, Sequencers, and Containment Spray have been reset for both trains.
- The 1B NS pump has been successfully swapped to the containment sump.
- 1NS-18A (A NS Pump Suct From Cont Sump) will not open.

Which one of the following is the reason 1NS-18A will not open?

- A. **1NS-43A (A ND to NS Containment Outside Isol) is CLOSED**
- B. **"NS SYS CPCS TRAIN A INHIBIT" light LIT**
- C. **1NI-185A (RB Sump to Train A ND & NS) is CLOSED**
- D. **1NS-43A (A ND to NS Containment Outside Isol) is OPEN**

Distracter Analysis:

- A. **Incorrect:.**
- B. **Incorrect**
Plausible:
- C. **Correct:.**
Plausible:.
- D. **Incorrect:.**
Plausible:.

Level: RO

Source: BANK

KA: SYS 026 K4.07(3.8*/4.1*)

Lesson Plan Objective: OP-MC-ECC-NI Obj. 8 ,

Source: BANK

Level of knowledge: comprehension

References:

1. OP-MC-ECC-NS page 17

2. EP/1A/5000/ES-1.3 page 8
3. OP-MC-ECC-NI page 21

1 Pt

Unit 2 is in an outage. All the fuel is in the spent fuel pool. A fuel shuffle is in progress in the spent fuel pool. During the shuffle a fuel assembly is accidentally damaged and 2EMF-42 (Fuel Building Ventilation Radiation Monitor) goes into Trip 2.

Which one of the following describes the effect on spent fuel pool ventilation system as a result of 2EMF-42 in Trip 2?

- A. The VF supply and exhaust fans trip and the filter is placed in the FILTRATION MODE.
- B. No effect on VF system alignment.
- C. The VF system is automatically placed in BYPASS MODE and the discharge dampers open and supply dampers close
- D. The VF system is automatically placed in the FUEL HANDLING MODE OF OPERATION and the supply fans trip.

Distracter Analysis: When fuel handling is in progress the VF system is placed in Filter Mode as a result no system changes will occur.

- A. Incorrect:
Plausible:.
- B. Correct:
- C. Incorrect:
Plausible:
- D. Incorrect:
Plausible:.

Level: RO

KA: SYS 072 A3.01 (2.9*/3.1)

Lesson Plan Objective: OP-MC-FH-VF Obj 8 & 9

Source: BANK

Level of knowledge: Comprehension

References:

1. OP-MC-FH-VF page 17

1 Pt

Unit 1 is at 100% power when indications are received of a "1B' Reactor Coolant Pump seal malfunction. AP/1/A/5500/08 (*Malfunction of NC Pump*) is implemented.

Which one of the following conditions describes a number two seal failure?

- A. **# 1 Seal Leak off flow – GOING DOWN**
 NC Pump number 2 Seal Standpipe low level alarm – LIT
 NCDT input – STABLE, OR GOING DOWN
 - B. **# 1 Seal Leak off flow – GOING UP**
 NC Pump number 2 Seal Standpipe high level alarm – LIT
 NCDT input – STABLE, OR GOING DOWN
 - C. **# 1 Seal Leak off flow – GOING DOWN**
 NC Pump number 2 Seal Standpipe high level alarm – LIT
 NCDT input – GOING UP
 - D. **# 1 Seal Leak off flow – GOING UP**
 NC Pump number 2 Seal Standpipe low level alarm – LIT
 NCDT input – GOING UP
-

Distracter Analysis:

- A. **Incorrect:**
 Plausible: #1 Seal L/O WILL go down
- B. **Incorrect:**
 Plausible: High Standpipe level alarm WILL lite.
- C. **Correct:**
- D. **Incorrect:**
 Plausible: NCDT input WILL go up

Level: RO

KA: SYS 003 A3.03 (3.2/3.1)

Lesson Plan Objective: OP-MC-PS-NCP, Obj. 12

Source: Bank

Level of knowledge: Comprehension

References:

1. OP-MC-PS-NCP pages 25-29
2. AP/1/A/5500/08 Malfunction of NC Pump

1 Pt

Which one of the following pre-planned activities that has been evaluated and approved in advance by Operations can take place during shift turnover?

- A. Dilution to ECB**
- B. ZPPT**
- C. Drain to Mid-Loop**
- D. Reactor Startup**

Distracter Analysis:

- A. Correct:**
- B. Incorrect:** Should not be scheduled during turnover
Plausible:
- C. Incorrect:** Should not be scheduled during turnover
Plausible
- D. Incorrect:** Should not be scheduled during turnover
Plausible:.

Level: RO

KA: G2.1.3 (3.0/3.4)

Lesson Plan Objective:

Source: Bank

Level of knowledge: memory

References:

1. OMP 2-2 page 31

Bank Question: 1012.1**Answer: D**

1 Pt.

Unit 1 is responding to a small break LOCA inside and outside containment. Given the following events and conditions:

- FWST Level indicates 340 inches
- Containment pressure indicates 1.5 psig
- Containment Sump Level indicates 1.05 ft
- 1EMF-41 (*AUX BLDG VENTILATION*) is in Trip 2 alarm
- Aux Building area radiation monitors are in alarm
- 1EMF-51A and B (*CONTAINMENT TRN A & B*) indicates 25 R/Hr
- Hydrogen Analyzer indicates 0.7% in containment
- NLO's report significant leakage at the seals of the "1A" ND pump

Which one of the following actions reduces excessive levels of radiation and guard against personnel exposure?

- A. Monitor 1EMF-41 (*AUX BLDG VENTILATION*)**
- B. Dispatch NLO to energize Hydrogen Recombiners**
- C. Secure VA (*Aux. Bldg. Ventilation System*) to limit airborne contamination.**
- D. Identify and isolate the break**

Distracter Analysis: The initial conditions provide a LOCA into containment and a leakage path outside of containment. The question is which of the problems take priority? The purpose is not to memorize procedure steps but to answer this from a broader perspective.

- A. Incorrect:** Monitoring of rad levels does not minimize exposure.
Plausible: If the candidate thinks that the abnormal radiation level requires priority action.
- B. Incorrect:** Energizing the Hydrogen Recombiners does not limit rad exposure in the Aux. Bldg.
Plausible: Small Hydrogen Concentration inside containment exists).
- C. Incorrect:** This is needed to limit personnel exposure..
Plausible: If the candidate thinks there is an airborne problem.
- D. Correct:**

Level: RO

KA: G3.10 (2.9/3.3)

Lesson Plan Objective: EP-E1 OBJ 3

Source: BANK

Level of knowledge: comprehension

References:

1. OP-MC-EP-E1 page 231, 233, 235
2. EP/1/A/5000/ECA-1.2

1 Pt. Unit 1 is in mode 5 with the operators preparing for a plant startup by drawing a bubble in the pressurizer.

Given the following conditions:

- 1) LTOPs is in service
- 2) Pressurizer pressure is 325 psig
- 3) Pressurizer level is 25%
- 4) $T_{ave} = 175^{\circ}\text{F}$

If pressure increases to 400 psig, which one of the following describes the correct inputs for a PORV to actuate in LTOP mode?

- A. 'D' loop Hot leg WR temperature < 320 degrees and WR pressure 'D' loop > 380 psig will actuate PORV NC-34A
- B. 'C' loop Cold Leg temperature < 320 degrees and NR pressure 'A' loop > 380 psig will actuate PORV NC-32B
- C. 'C' loop Cold Leg temperature < 320 degrees and WR pressure 'A' loop > 380 psig will actuate PORV NC-32B
- D. 'D' loop Hot Leg WR temperature < 320 degrees and NR pressure 'D' loop > 380 psig will actuate PORV NC-34A

MISCINFO: RO

SOURCE: NEW

Level of Knowledge: Memory

Author: CWS

REFERENCES: OP-MC-PS-NC pages 45 & 49

LESSON: OP-MC-PS-NC

OBJECTIVE: OP-MC-PS-NC Obj. 21

K/A: APE 008 AA206 (3.3/3.6)

- 1 Pt. Initial Conditions:
- Unit 1 is at 100% power
 - "A" train essential components are in service

OAC alarms indicate an increase in reactor coolant pump motor winding temperatures.

Which of the following describes the reason for the increase in temperatures?

- A. 1RN-40A (Train A to Non Essential Hdr Isol) has closed**
- B. 1KC-338B (NCP Supply)has closed**
- C. 1RN-43A (Train 1B to Non Ess Hdr Isol) has closed**
- D. 1KC-228B (RB HDR supply) has closed**

Distracter Analysis:

- A. Correct**
- B. KC system has no effect on motor stator temperatures**
- C. Closure of this valve will have no effect on stator temperatures**
- D. KC system has no effect on motor stator temperatures**

Level: RO

KA: APE 015 AA2.01 (3.0/3.5)

Lesson Plan Objective: OP-MC-PS-NCP Obj 7
OPO-MC-PSS-RN Obj 10

Source: New

Author: CWS

Level of knowledge: memory

References:

- 1. OP-MC-PS-NCP page 5, 13 & 17
- 2. OP-MC-PSS-RN page 31 & 75

Date: 3/06/2003

1 Pt.

Unit 2 was operating at 100% power with the Pressurizer Pressure Control Switch in the '1-2' position and NC pressure in the normal operating band. Given the following plant conditions and events:

- NC pressure increases
- PORVs 1NC 32B and NC 36B open at 2335 psig
- Pressure modulates between 2315 psig and 2335 psig.

Which one of the following instrument failures would cause this plant response and what is the correct operator action per AP/11 (*Pressurizer Pressure Anomalies*)?

- A. **PZR pressure channel I fails high**
Immediately swap controlling channels
 - B. **PZR pressure channel II fails low**
Place Pressurizer Pressure Master in Manual
 - C. **PZR pressure channel I fails low**
Place Pressurizer Pressure Master in Manual
 - D. **PZR pressure channel II fails high**
Immediately swap controlling channels.
-

Distracter Analysis:

- A. **Incorrect:** - channel I failing high causes pressure to decrease
Plausible: -
- B. **Incorrect answer** – If a channel II fails low you immediately swap controlling channels.
- C. **Correct:**
- D. **Incorrect:** -
Plausible: -

Level: RO Only

KA: APE 027 AK3.03 (3.7/4.1)

Lesson Plan Objective: PS-IPE Obj. 12

Source: NEW

Author: CWS

Level of knowledge: comprehension

References:

1. OP-MC-PS-IPE page 35

1 Pt. Unit 1 is operating at 100% power when a small break LOCA occurs.

Given the following

- a) Reactor Trip and Safety Injection Actuated
- b) E-0 (*Reactor Trip or Safety Injection*) completed
- c) Crew has exited E-0 to E-1 (*Loss of Reactor or Secondary Coolant*)
- d) Both trains of ECCS equipment are functioning normally
- e) Subcooling is 0 degrees
- f) Pressurizer level is 2%
- g) Containment pressure is 2.5 psig

Which one of the following should be the status of the reactor coolant pumps?

- A. The reactor coolant pumps should still be running to provide forced cooling through the core.
- B. The reactor coolant pumps should be stopped to prevent excessive depletion of the NC system water inventory.
- C. The reactor coolant pumps should still be running to refill the pressurizer in order to terminate *Safety Injection* flow.
- D. The reactor coolant pumps should be stopped to prevent pump damage due to loss of pump support systems.

Distracter Analysis:

- A. Incorrect – NCP should be stopped on loss of subcooling
- B. Correct.
- C. Incorrect
- D. Incorrect: Do not lose support systems on 2.5 # in containment.

Level: RO

KA: APE 009 EK3.13 (3.4/3.7)

Lesson Plan Objective: OP-MC-EP-ECA-0 Obj. 4

Source: New

Level of knowledge: Comprehensive

Author: CWS

References:

1. OP-MC-EP-E1 page 53

1 Pt.

Unit 2 is operating at 100% power when the following occurs:

- Loss of offsite power
- Neither Diesel Generator starts
- ECA-0.0 (*Loss of All AC Power*) is in effect
- Standby Makeup pump for unit 2 tagged for maintenance
- Reactor Coolant Pump seal injection valves have been closed

Twenty minutes later power is restored to Unit 2 ETA from Unit 1, and the crew enters ECA-0.1 (*Loss of All AC Power Recovery Without S/I Required*).

Which of the following best describes the proper method for restoring NCP seal flows in ECA-0.1?

- A. Slowly restore seal injection cooling limiting the cooldown rate to 1 degree per minute**
- B Do not restore seal injection cooling due to potential damage to the KC thermal barrier heat exchanger.**
- C Restore seal injection cooling as rapidly as possible to minimize the potential for seal degradation.**
- D. Do not restore seal injection cooling due to potential damage of thermal shock to the reactor coolant pump seals.**

Distracter Analysis:

- A. Incorrect – old procedure guidance**
- B. Incorrect do not restore seal cooling after needle valves closed.**
- C. Incorrect do not restore seal cooling after needle valves closed**
- D. Correct**

Level: RO

KA: APE 022 AK1.01 (2.8/3.2)

Lesson Plan Objective: OP-MC-EP-ECA-0 Obj. 3

Source: New

Level of knowledge: Comprehension

Author: CWS

References:

1. OP-MC-EP-ECA-0 page 79

1 Pt. Unit 1 has experienced a large break LOCA.

Given the following conditions:

- E-0 (*Reactor Trip or Safety Injection*) is complete
- ES 1.3 (*Transfer to Cold Leg Recirc*) is complete
- Six hours have elapsed since the LOCA and ES 1.4 (*Hot Leg Recirc*) is being implemented.
- 1NI-121A (Train 'A' NI to B & C Hot Leg) will not open due to mechanical binding.
- ND Train 'A' has been aligned for Hot Leg Recirc.
- ND Train 'B' is aligned for Auxiliary Containment Spray.

Which of the following best describes the effects on the ND system if the 'A' ND pump trips?

- A. Flow is lost to the 'A' and 'B' hot legs**
- B. Flow is lost to the 'A', 'B', 'C' and 'D' hot legs**
- C. Flow is lost to the 'B' and 'C' hot legs**
- D. Flow is lost to 'A' and 'D' hot Legs**

Distracter Analysis:

- A. Incorrect – This is alignment for CLR**
- B. Incorrect all legs are not aligned for hot leg recirc**
- C. Correct**
- D. Incorrect flow is not go aligned to "A" and "D" hot legs**

Level: RO

KA: APE 025 AK2.02 (3.2*/3.2)

Lesson Plan Objective: OP-MC-PS-ND Obj. 8

Source: New

Level of knowledge: memory

Author: CWS

References:

1. OP-MC-PS-ND pages 51 & 73

1 Pt. Unit 1 is operating at 100% power when the 'A' Main steam line ruptures outside containment and depressurizes the 'A' S/G.

Which of the following describes the logic and coincidence needed to actuate a Main Steam Isolation signal?

- A. 1/4 on 1/4 steamlines**
- B. 2/3 on 2/4 steamlines**
- C. 1/4 on 2/4 steamlines**
- D. 2/3 on 1/4 steamlines**

Distracter Analysis:

- A. Incorrect –**
- B. Incorrect**
- C. Incorrect**
- D. Correct**

Level: RO

KA: APE 040 AK3.01 (4.2/4.5)

Lesson Plan Objective: OP-MC-ECC-ISE Obj. 13

Source: New

Level of knowledge: memory

Author: CWS

References:

1. OP-MC-ECC-ISE page 65

1 Pt.

Given the following Unit 1 initial conditions

- 100% power with Tave = Tref
- NC System Boron Concentration 953 ppm
- Control Bank 'D' rods are at 217 steps
- Control Bank 'D' Rod H-8 drops fully into the core
- AP/1A/5500/14 *Rod Control Malfunction* is entered and immediate actions are completed

Thirty minutes after the rod drops

- Load has been reduced to 95% power with Tave = Tref
- NC System Boron Concentration 953 ppm
- Control Bank 'D' rods are at 217 steps
- Rod H-8 has not been retrieved

Which one of the following describes the effect of the event on Rod Insertion Limits and Shutdown Margin?

- A. Rod insertion limit is unchanged and shutdown margin is increased.
- B. Rod insertion limit is decreased and shutdown margin is unchanged.
- C. Rod insertion limit is unchanged and shutdown margin is decreased.
- D. Rod insertion limit is decreased and shutdown margin is decreased.

-----Distracter

Analysis:

- A. Incorrect:
Plausible:.
- B. Incorrect:.
Plausible:.
- C. Incorrect:
- D. Correct:
Plausible: .

Level: RO

KA: 000003.AK1.07 (3.1/3.9)

Lesson Plan Objective:

Source: New

Author: CWS

Level of knowledge: comprehensive

References:

1. McGuire 1 Cycle 16 COLR pages 9,11 & 12
2. REACT (Reactor Engineering Analysis & Computer Tools)
Shutdown Margin-Unit at Power, Modes 1 & 2 Calculations

1 Pt. Unit 1 is in Mode 3 at normal operating temperature and pressure. While performing trouble shooting activities 1NV-94AC (NC Pump Seal Return Containment Isolation Valve) closes.

Which of the following best describes the effect on the Reactor Coolant Pumps seal return flow?

- A. Seal return flow continues and is routed to the NCDT.**
- B. Seal return flow continues through 1NV-95B to VCT.**
- C. Seal return flow continues and is routed to the PRT.**
- D. Seal return flow continues to the VCT through a bypass line around 1NV-94AC.**

Distracter Analysis:

- A. Incorrect – seal return flow goes to PRT**
- B. Incorrect 1NV-94 and 1NV-95 are in series Student may think the valves are in parallel.**
- C. Correct**
- D. Incorrect – check valve prevents this flow path**

Level: RO

KA: SYS 003 K6.04 (2.8/3.1)

Lesson Plan Objective: OP-MC-PS-NV Obj. 5

Source: New

Level of knowledge: Memory

Author: CWS

References:

1. OP-MC-PS-NV pages 39, 41 & 115

1 Pt.

Unit 2 was operating at 49% power when the following indications were observed:

- Steam Generator level in the 2A S/G is 84% on 2/3 level indications
- Feedwater flows decreasing
- Feedwater Isolation Signal actuated

Which of the following describes the plant response to the above condition?

- A. Feedwater pump 'A' only has tripped.**
- B. Both feedwater pumps have tripped, the turbine and reactor have tripped.**
- C. Feedwater pump 'A' and the turbine only have tripped.**
- D. Both feedwater pumps and turbine have tripped, the reactor did not trip.**

Distracter Analysis:

- A. Incorrect: – both FWPTs trip, turbine and reactor trips because above P-8 – 48%**
- B. Correct**
- C. Incorrect: - see A above**
- D. Incorrect: reactor trips above P-8 48%**

Level: RO

KA: SYS 059 K4.01 (3.3/3/5)

Lesson Plan Objective: OP-MC-CF-CF Obj. 14
OP-MC-IC-IPE Obj. 10 & 11

Source: New

Level of knowledge: Comprehensive

Author: CWS

References:

1. OP-MC-CF-CF page 35
2. OP-MC-IC-IPE pages 79, 81 & 83

1 Pt.

Given the following conditions:

- Unit 1 is at 100%
- No annunciators are in alarm
- TD CA pump is being started for post maintenance testing (oil change)
- RO places the #1 TD CA Pump to 'START'
- The TD CA pump starts but does not achieve rated speed.

Which of the following describes the potential reason the TD CA pump failed to reach rated speed?

- A. The TD CA pump stop valve is not fully open.**
- B 1SA-48ABC (1C S/G SM Supply to unit 1 TD CA Pump Turb Isol) failed to OPEN.**
- C The Control Room/Local switch at local panel is in Local control.**
- D. The Woodward Governor speed setting was not cycled after the last PT.**

Distracter Analysis:

- A. Incorrect – would have an annunciator if the valve is not fully open.**
- B. Incorrect SA 48 and SA 49 are in parallel no effect.**
- C. Incorrect TD CA pump would not start if in local. There is a status light that would be lit if this switch were in local.**
- D. Correct**

Level: RO

Source: NEW

KA: SYS 039 A4.04 (3.8/3.9)

Lesson Plan: OP-MC-CF-CA

Lesson Plan Objective: OP-MC-CF-CA Obj. 7

Level of knowledge: Memory

Author: CWS

References:

OP-MC-CF-CA pages 15, 23, 25 & 27

1 Pt.

During the delivery of chlorine gas cylinders on site, a cylinder fell from the truck and ruptured. All control room VC intakes closed except 1VC-9A (VC OTSD AIR INTAKE ISOL FROM UNIT 2) and 1VC-11B (VC OTSD AIR INTAKE ISOL FROM UNIT 2) which were mechanically bound and failed to close completely. Chlorine gas has entered the control room. AP/1/A/5500/17 (*Loss of Control Room*) has been implemented on both Units.

Which one of the following describes S/G pressure control for the condition described above?

- A. All S/G PORV's are controlling between 1092 psig and 1125 psig.
- B. 'A' and 'B' S/G PORV's are controlled manually to maintain less than 1170 psig.
- C. 'C' and 'D' S/G PORV's are controlled manually to maintain less than 1170 psig
- D. Only 'A' and 'D' S/G PORV's are controlling between 1092 psig and 1125 psig.

Distracter Analysis: Manual control of S/G pressure if only taken if S/G pressure is greater than 1170 psig and the S/G safeties are lifting. Only the 'A' and 'D' S/G have local manual control available.

- A. **Correct:**
Plausible:
- B. **Incorrect:** Can not control 'B' S/G manually
Plausible:
- C. **Incorrect:** Can not control 'C' S/G manually.
- D. **Incorrect:** All S/G's would be functioning normally

Level: RO

KA: APE 000068 (3.7/4.0)

Lesson Plan Objective: OP-MC-AP-17 Obj. 2

Source: New

Level of Knowledge: Comprehension

References:

- 1. OP-MC-AP-17 Obj. 2
- 2. AP/1/A/5500/17 page 10 and Enclosure 7

3. AP/1/A/5500/17 Background document page 14

1 Pt.

Given the following conditions on Unit 1:

- Blackout on ETB
- The 1B D/G started in automatic mode and tripped due to overspeed
- An Operator has been dispatched to depress "Emergency Stop Reset Pushbutton".

Which one (1) of the following describes why the diesel generator restarted once the Emergency Stop Reset Pushbutton was depressed?

- A. The engine overspeed trip resets, and the undervoltage condition was still present.**
- B. The sequencer was reset to its ground state and the accelerated sequence relay timed out.**
- C. The sequencer was reset and placed it in priority mode and the undervoltage condition was still present.**
- D. The engine overspeed trip resets, and the accelerated sequence relay timed out.**

Distracter Analysis: The actions needed to retart the diesel after an automatic start are listed in 'A' above.

- A. Correct:**
Plausible:
- B. Incorrect:**
Plausible:
- C. Incorrect:**
Plausible:
- D. Incorrect**
Plausible:

LEVEL: RO**KA:** 00051 EA1.02 (4.3/4.4)**SOURCE:** NEW**LEVEL OF KNOWLEDGE:** Analysis**AUTHOR:** CWS

LESSON: OP-MC-DG-DG

OBJECTIVES: OP-MC-DG-DG Obj 10

REFERENCES: OP-MC-DG-DG pages 23

1 Pt

Given the following conditions:

- Unit 1 is operating at 25% power
- All electrical systems are in normal alignment
- The normal incoming breaker to 1EMXA trips because of a thermal overload.

Which one of the following describes the effect on 125 VDC Distribution Center EVDA?

- A. **No effect; alternate power to Charger Connection box ECB-1 will swap within 8 cycles and maintain power to EVDA.**
- B. **No effect; battery EVCC will continue to power EVDA.**
- C. **No effect; battery EVCA will continue to power EVDA.**
- D. **EVDA will be de-energized until cross tied with EVDD.**

Distracter Analysis:.

- A. **Incorrect:** Charger connection box is Kirk-keyed
Plausible:
- B. **Incorrect:** No automatic function for EVCC to power EVCA
Plausible:
- C. **Correct:**
Plausible:
- D. **Incorrect** Can't crosstie EVDA and EVDD
Plausible:

LEVEL: RO

KA: 00062 K1.03 (3.5/4.0)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Memory

AUTHOR: CWS

LESSON: OP-MC-EP-EPL

OBJECTIVES: OP-MC-EP-EPL Obj 9

REFERENCES: OP-MC-EP-EPL pages 21 & 69

1 Pt

Unit 2 was operating at 100% when a Floor Cooling Glycol High Temperature annunciator is received. A review of the RTD panel reveals that several ice condenser floor slabs have high temperature indications. An operator determines that 2NF-848 (*NF Floor Cooling Slab Temp Control*) has failed closed. An inspection of the lower ice condenser reveals that eight (8) ice condenser bays have experienced buckling.

Which one of the following statements describes the effect on peak containment pressure and time to reach peak containment pressure?

- A. Design containment pressure of 15 psig will not be exceeded. The time to reach peak containment pressure is 50 minutes.
- B. Design containment pressure of 15 psig could be exceeded. The time to reach peak containment pressure is 1.75 hours.
- C. Design containment pressure of 60 psig will not be exceeded. The time to reach peak containment pressure is 50 minutes.
- D. Design containment pressure of 60 psig could be exceeded. The time to reach peak containment pressure is 1.75 hours.

Distracter Analysis: There are 24 ice condenser bays in containment. With 8 bays having experienced buckling and the doors incapable of opening 1/3 of the total flowpath into the ice condenser is now blocked.

- A. **Incorrect:** peak containment pressure is reached in 1.75 hours
Plausible: peak containment pressure is correct.
- B. **Correct.**
Plausible:
- C. **Incorrect Answer:** peak pressure too high, time to reach is too short
- D. **Incorrect:** peak pressure too high.
Plausible: 20 psig is appropriate for some non-ice condenser plants..

Level: RO

KA: SYS 025K3.01(3.8*/3.8*)

Lesson Plan Objective: OP-MC-CNT-NF Obj. 20

Source: NEW

Level of knowledge: Comprehension

References:

1. OP-MC-CNT-NF pages 69 & 17
2. OP-MC-CNT-CNT pages 17 & 21

1 Pt

Which one of the following are the power supplies for the Unit 1 MG sets?

- A. 1LXE and 1LXF
- B. 1LXF and 1LXG
- C. 1SLXF and 1SLXG
- D. 1SLXG and 1SLXH

Distracter Analysis:.

- A. **Incorrect:** 1LXE is not correct
Plausible:
- B. **Correct:**
Plausible:
- C. **Incorrect:** Power does not come from shared load centers
Plausible:
- D. **Incorrect:** Power does not come from shared load centers
Plausible:

LEVEL: RO

KA: 00001 K2.05 (3.1*/3.5)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Memory

AUTHOR: CWS

LESSON: OP-MC-IC-RTB

OBJECTIVES: OP-MC-IC-RTB Obj 11

REFERENCES: OP-MC-IC-RTB page 19

1 Pt

Which one of the following is the power supply for the 2B Hydrogen Recombiner?

- A. 2TA
- B. 2ETA
- C. 2EMXC
- D. 2EMXD

Distracter Analysis:.

- A. Incorrect:
Plausible:
- B. Incorrect:
Plausible:
- C. Incorrect:
Plausible:
- D. Correct
Plausible:

LEVEL: RO

KA: 0028 K2.01 (2.5*/2.8*)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Memory

AUTHOR: CWS

LESSON: OP-MC-CNT-VX

OBJECTIVES:

REFERENCES: OP-MC-CNT-VX page 49

1 Pt

Given the following conditions on Unit 2:

- 75% power
- Annunciator "Subcooling Margin Alert" comes into alarm

Which one of the following describes the origin of the alarm?

*Reference Provided
Steam Tables*

- A. Wide Range Pressure Loop 'C' fails to '0' psig
- B. Wide Range Pressure Loop 'D' fails to '0' psig
- C. One safety related thermocouple fails to 725 degrees
- D. Wide Range T hot 'B' loop failing high to 650 degrees

Distracter Analysis:. The alarm 'Subcooling Margin Alert' is actuated due to 'A' train inputs only

- A. **Incorrect:** Input to 'B' train
Plausible:
- B. **Correct:**
Plausible:
- C. **Incorrect:** $625 \times 4 + 750 = 3225 / 5 = 645$ degrees which is not within 2 degrees of 650 where the alarm would come in
Plausible: Average CETC temp at 100% is 624 degrees
- D. **Incorrect** Input to 'B' train
Plausible:

LEVEL: RO**SOURCE:** NEW**LEVEL OF KNOWLEDGE:** Comphrension**KA:** SYS 002 K6.06 (2.5/2.8)**AUTHOR:** CWS**LESSON:** OP-MC-IC-ICM

OBJECTIVES: OP-MC-IC-ICM Obj 9

REFERENCES: OP-MC-IC-ICM page 33

1 Pt

Unit 1 was at 100% power when the 'A' FWPT trips. Rods fail to insert as required. The RO places the control rod mode select to manual. The combined power mismatch signal is +4. The operator drives rod in.

Which one of the following describes the response of the rod control system?

- A. Rods will insert at 72 steps per minute.
 - B. Rods will insert at 64 steps per minute.
 - C. Rods will insert at 40 steps per minute.
 - D. Rods will insert at 48 steps per minute.
-

Distracter Analysis:

- A. **Incorrect:** this speed is for auto mode only at a 5 degree mismatch
Plausible:
- B. **Incorrect:** this speed is for shutdown banks only
Plausible:
- C. **Incorrect:** this speed is correct for auto rod movement at a 4 degree error
Plausible:
- D. **Correct**
Plausible:

LEVEL: RO

KA: 014 A4.02 (3.4/3.3)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Memory

AUTHOR: CWS

LESSON: OP-MC-IC-IRX

OBJECTIVES: OP-MC-IC-IRX Obj 8

REFERENCES: OP-MC-IC-IRX pages 21, 23, 25

1 Pt

A fire on the McGuire site has rendered the control room uninhabitable due to smoke in the control room. Both units have entered the AP/1/A/5500/17 (*Loss of Control Room*).

Which one of the following describes the RO actions described in AP/1/A/5500/17 *Loss of Control Room*?

- A. **Go to Aux Shutdown Panel.**
- B. **Go to main turbine front standard.**
- C. **Go to Unit 1 CF pumps.**
- D. **Go to "REACTOR PUMP WATER MAKEUP CONTROL PANEL" if dilution in progress.**

Distracter Analysis:.

- A. **Incorrect:** this is an SRO function
 Plausible:
- B. **Incorrect:** this is an NLO function
 Plausible:
- C. **Incorrect:** this is an NLO function
 Plausible:
- D. **Correct**
 Plausible:

LEVEL: RO

KA: G 2.4.34 (3.8/3.6)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Memory

AUTHOR: CWS

LESSON: OP-MC-AP-17

OBJECTIVES: OP-MC-AP-17 Obj. 2

REFERENCES: AP 17 Background document pages 4-6
 AP/1/A/5500/17 page 3

1 Pt

While shifting to cold leg recirc during a LOCA, 1ND 58A (*NV/ NI pump Train A Isolation*) will not open.

Which one of the following is a possible cause of this problem?

- A. 1NI-115B (*A NI Pump Miniflow*) must first be closed.
 - B. 1NI-185A (*TRAIN A ND TO NV & NI PUMPS*) must first be open.
 - C. 1ND-19A (*A ND Pump Suction From FWST or NC*) must first be open.
 - D. 1NI-144B (*B NI Pump Miniflow*) must first be closed.
-

LEVEL: RO

SOURCE: NEW

LEVEL OF KNOWLEDGE: MEMORY

LESSON: OP-MC-ECC-NI

OBJECTIVE: OP-MC-ECC-NI Obj. 8

REFERENCES: OP-MC-ECC-NI page 21

K/A: 006 K3.01 (4.1/4.2)

AUTHOR: CWS

1 Pt

Given the following conditions on Unit 1:

- Unit 1 is in Mode 5 after an outage.
- 'B' Train of ND is in RHR mode
- In the process of swapping to 'A' train ND
- An NLO is stationed outside the 'A' ND HX room to listen for excessive vibration.
- After the swap has been completed the following is noticed
 - a. EMF 1 and EMF 41 in alarm
 - b. NC level decreasing and temperature increasing
 - c. ND flow increasing

Which one (1) of the following is the cause of the above failure?

- A. Relief valve 1ND-56 (*Discharge Relief Valve*) has failed open to PRT
- B. 1ND-34 (*A & B ND Hx Bypass*) fails OPEN
- C. Relief valve 1ND-56 (*Discharge Relief Valve*) has failed open to NCDT.
- D. Flange leak on 'A' RHR heat exchanger.

Distracter Analysis:. The procedure for swapping ND trains has an operator sent to the HX room to listen for excessive vibration. McGuire has experienced an event where a leak developed on the flange of the RHR HX as a result of a water hammer.

- A. **Incorrect:** would not have auxiliary building EMFs in alarm
Plausible:
- B. **Incorrect:** This would account for the temperature increasing
Plausible:
- C. **Incorrect:** Relief goes to PRT
Plausible:
- D. **Correct**
Plausible:

LEVEL: RO

KA: 005 K6.03 (2.5/2.6)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Memory

AUTHOR: CWS

LESSON: OP-MC-PS-ND

OBJECTIVES: OP-MC-PS-ND Obj. 6

REFERENCES: OP-MC-PS-ND pages 21 and 61

1 Pt

Given the following conditions on Unit 1:

- Unit 1 ETB normal breaker has opened
- '1B' Diesel Generator has started and has loaded the bus

Which one (1) of the following will trip the diesel generator?

- A. Lube Oil Temperature 195 degrees**
- B. Jacket Water Temperature 205 degrees**
- C. Turning Gear Engaged**
- D. Overspeed 113%**

Distracter Analysis:.

- A. Incorrect:** Manual mode only
Plausible:
- B. Incorrect:** Manual mode only
Plausible:
- C. Incorrect:** Manual mode only
Plausible:
- D. Correct**
Plausible:

LEVEL: RO

KA: 064 K4.02 (3.9/4.2)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Memory

AUTHOR: CWS

LESSON: OP-MC-DG-DG

OBJECTIVES: OP-MC-DG-DG Obj. 5 & 6

REFERENCES: OP-MC-DG-DG pages 39-43 odd pages only

1 Pt

Diesel generator '1B' has been started per OP/1/A/6350/002 (Diesel Generator) from the control room. The diesel has been carrying the load separated from the grid. It is time in the procedure to transfer load back to the grid and shutdown the diesel.

Which one (1) of the following describes the actions in proper sequence necessary to remove load from the diesel?

- A. Match D/G voltage with line voltage**
Place '1B D/G Sync Switch' to 'ON'
Adjust diesel speed to move slowly in the Fast direction using '1B D/G Gov Control' pushbutton
Close normal breaker when 3 minutes before 12 o'clock
Raise D/G output to 800 to 1000 KW
Adjust Power factor to .90 to .92
- B. Place '1B Sync Switch' to 'ON'**
Adjust diesel speed to move slowly in the Fast direction using Voltage Adjust pushbutton
Transfer load from '1B' D/G to 1ATD by obtaining zero amps on 1ATD meter
Close normal breaker when 3 minutes before 12 o'clock
Raise D/G output to 800 to 1000 KW
Adjust Power factor to .90 to .92
- C. Place '1B Sync Switch' to 'ON'**
Adjust diesel speed to move slowly in the Fast direction using '1B D/G Gov Control' pushbutton
Close normal breaker when 3 minutes before 12 o'clock
Raise D/G output to 100 to 200 KW
Adjust Power factor to .90 to .92
Match D/G voltage with line voltage
- D. Place '1B Sync Switch' to 'ON'**
Adjust diesel speed to move slowly in the Fast direction using Voltage Adjust pushbutton
Transfer load from '1B' D/G to 1ATC by obtaining zero amps on 1ATC meter
Close normal breaker when 3 minutes before 12 o'clock
Raise D/G output to 100 to 200 KW
Adjust Power factor to .90 to .92

1 Pt

Diesel generator '1B' has been started per OP/1/A/6350/002 (Diesel Generator) from the control room. The diesel has been carrying the load separated from the grid. It is time in the procedure to transfer load back to the grid and shutdown the diesel.

Which one (1) of the following describes the actions in proper sequence necessary to remove load from the diesel?

- A. Match D/G voltage with line voltage
Place '1B D/G Sync Switch' to 'ON'
Adjust diesel speed to move slowly in the Fast direction using '1B D/G Gov Control' pushbutton
Close normal breaker when 3 minutes before 12 o'clock
Raise D/G output to 800 to 1000 KW
Adjust Power factor to .90 to .92**
- B. Place '1B Sync Switch' to 'ON'
Adjust diesel speed to move slowly in the Fast direction using Voltage Adjust pushbutton
Transfer load from '1B' D/G to 1ATD by obtaining zero amps on 1ATD meter
Close normal breaker when 3 minutes before 12 o'clock
Raise D/G output to 800 to 1000 KW
Adjust Power factor to .90 to .92**
- C. Place '1B Sync Switch' to 'ON'
Adjust diesel speed to move slowly in the Fast direction using '1B D/G Gov Control' pushbutton
Close normal breaker when 3 minutes before 12 o'clock
Raise D/G output to 100 to 200 KW
Adjust Power factor to .90 to .92
Match D/G voltage with line voltage**
- D. Place '1B Sync Switch' to 'ON'
Adjust diesel speed to move slowly in the Fast direction using Voltage Adjust pushbutton
Transfer load from '1B' D/G to 1ATC by obtaining zero amps on 1ATC meter
Close normal breaker when 3 minutes before 12 o'clock
Raise D/G output to 100 to 200 KW
Adjust Power factor to .90 to .92**

Distracter Analysis:.

- A. Correct:**

- Plausible:**
B. Incorrect:
Plausible:
C. Incorrect:
Plausible:
D. Incorrect
Plausible:

LEVEL: RO

KA: 064 A4.07 (3.4/3.4)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Comprehension

AUTHOR: CWS

LESSON:

OBJECTIVES:

REFERENCES: OP/1/A/6350/002 Enclosure 4.4 page 2

1 Pt

Given the following conditions on Unit 1:

- Unit 1 heating up in Mode 3 following a refueling outage
- An NLO calls the RO and advises that the boric acid filter delta/p is pegged HIGH
- Discharge pressure on 1A Boric Acid Tank pump is pegged HIGH

Which one (1) of the following describes the effect on the boron injection flowpath from the Boric Acid Tank?

- A. No effect after swapping to the 1B BAT pump.
- B. Boron injection flowpath from BAT via the boric acid pumps and charging pump to NC is inoperable.
- C. No effect after swapping to standby filter in service.
- D. Boron injection flowpath is operable due to availability of 1NV-265B.

Distracter Analysis:.

- A. Incorrect:
Plausible:
- B. Correct:
Plausible:
- C. Incorrect:
Plausible:
- D. Incorrect
Plausible:

LEVEL: RO

KA: 004 K1.16 (3.3/3.5)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Analysis

AUTHOR: CWS

LESSON: OP-MC-PS-NV

OBJECTIVES: OP-MC-PS-NV Objs. 5 & 15

REFERENCES: OP-MC-PS-NV pages 43, 51, & 133
SLC 16.9.9 Boration Systems – Flow Paths

1 Pt

Which one of the following describes the operational differences to ESF systems for a double ended break inside containment versus a LOCA outside Containment?

- A. On a LOCA outside containment there will be no containment isolation signal.
- B. There are no operational differences.
- C. On a LOCA outside containment the containment sump valves do not automatically open on low FWST level.
- D. As FWST inventory depletes there is no corresponding increase in containment sump level.

Distracter Analysis:.

- A. **Incorrect:** A manual S/I will be generated on low pressurizer level and charging flow as a result a containment isolation signal will actuate.
Plausible:
- B. **Incorrect:** Phase 'B' components will not actuate on LOCA outside containment
Plausible:
- C. **Incorrect:** Not correct they will open on 180" FWST level whether there is water in the sump or not.
Plausible:
- D. **Correct**
Plausible:

LEVEL: RO

KA: W/E-04 EK2.1 (3.5/3.9)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Comprehension

AUTHOR: CWS

LESSON: OP-MC-ECC-ISE
OP-MC-PS-ND

OBJECTIVES: OP-MC-PS-ND Obj. 7
OP-MC-ECC-ISE Objs. 5 and 13

REFERENCES: OP-MC-PS-ND page 29
OP-MC-ECC-ISE pages 15 & 29

1 Pt

Which one (1) of the following provides separation between control system and protection system circuits?

- A. Isolation Amplifier**
- B. Diodes**
- C. Separate input signal**
- D. Or/And gate**

Distracter Analysis:.

- A. Correct:**
Plausible:
- B. Incorrect:**
Plausible:
- C. Incorrect:**
Plausible:
- D. Incorrect**
Plausible:

LEVEL: RO

KA: SYS 016 K5.01 (2.7*/2.8*)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Memory

AUTHOR: CWS

LESSON: OP-MC-IC-IPE

OBJECTIVES:

REFERENCES: OP-MC-IC-IPE page 17

1 Pt

Given the following conditions on Unit 1:

- Loss of Offsite Power coincident with a LOCA
- Power has been restored to ETA via '1A' D/G while in EP/1/A/5000/ECA-0.0 (*Loss of All AC Power*)
- NC Subcooling is -1 degree
- Pzr level is 0%
- 1NI-9A (*NC Cold Leg Inj from NV*) is closed
- 1NI-10B (*NC Cold Leg Inj from NV*) is closed

Which one (1) of the following procedure is required for optimal recovery of the plant?

- A. **Go to EP/1/A/5000/ECA-0.1 (*Loss of All AC Power Recovery Without S/I Required*)**
- B. **Go to EP/1/A/5000/E-1 (*Loss of Reactor or Secondary Coolant*)**
- C. **Go to EP/1/A/5000/ECA-0.2 (*Loss of All AC Power Recovery With S/I Required*)**
- D. **Go to EP/1/A/5000/ES-1.2 (*Post LOCA Cooldown and Depressurization*)**

Distracter Analysis:.

- A. **Incorrect:**
Plausible:
- B. **Incorrect:**
Plausible:
- C. **Correct:**
Plausible:
- D. **Incorrect**
Plausible:

LEVEL: RO**KA: 000056 AK1.04 (3.1*/3.2*)****SOURCE: NEW****LEVEL OF KNOWLEDGE: Comprehension****AUTHOR: CWS**

LESSON: OP-MC-EP-ECA-0

OBJECTIVES: OP-MC-EP-ECA-0 Obj 2

REFERENCES: OP-MC-EP-ECA-0 Page 61
EP/1A/5500/ECA 0.0 page 30

1 Pt

Given the following conditions on Unit 1:

- Large break LOCA occurred.
- Both trains of NV, NI, ND, NS are running

	Loop A	Loop B	Loop C	Loop D
S/G (NR) [%]	10	9	10	9

The operators are in E-0 (*Reactor Trip or Safety Injection*) step 17. The RO tells the SRO NC temperature is decreasing. The RO is instructed to implement Enclosure 3 *Uncontrolled NC System Cooldown*.

Which one of the following statements correctly describes the method for controlling feed flow?

REFERENCES PROVIDED:
E-0 Enclosure3

- A. When N/R level is greater than 11% in one S/G throttle feed flow to minimum and maintain N/R level greater than 11% in at least one S/G.
- B. When N/R level is greater than 32% in all S/Gs throttle feed flow to minimum and maintain N/R level greater than 32% in all S/Gs.
- C. If N/R level is less than 11% in all S/Gs throttle feed flow to minimize cooldown and maintain total feedwater flow greater than 450 gpm.
- D. If N/R level is less than 32% in all S/Gs throttle feed flow to minimize cooldown and maintain total feedwater flow greater than 450 gpm.

Distracter Analysis:

- A. Incorrect:
Plausible:
- B. Incorrect:
Plausible:
- C. Incorrect
- D. Correct:
Plausible:

Level: RO

KA: SYS 061 K5.01 (3.6/3.9)

Lesson Plan Objective: OP-MC-EP-E0 Obj. 6

Source: NEW

AUTHOR: CWS

Level of knowledge: Analysis

References:

1. OP-MC-EP-E-0 page 75
2. EP/1/A/5000/E-0 Enclosure 3 - PROVIDED

1 Pt

Given the following conditions on Unit 1:

- RTP 100%
- A CM system transient has caused both FWPT's to trip.
- The turbine and reactor failed to trip automatically.
- The Operator at the Controls, per the immediate actions of FR-S.1 (*Response to Nuclear Power Generation/ATWS*), will
 1. Manually trip the Reactor if it fails to trip, insert control rods.
 2. Manually trip the Turbine if it fails to trip, runback the turbine in fast action.

Which one (1) of the following describes the bases for the immediate actions in FR-S.1 (*Response to Nuclear Power Generation/ATWS*)

- A. The safeguards systems are designed assuming that the only heat being added to the NC system is decay heat and NC pump heat. If the reactor will not trip, then the rods are manually inserted to lower reactor power. For an ATWS event with a loss of normal feedwater, a Turbine trip within 30 seconds will prevent challenging the PZR PORV's.
- B. The safeguards systems are designed assuming that the only heat being added to the NC system is decay heat and NC pump heat. If the reactor will not trip, then the rods are manually inserted to lower reactor power. For an ATWS event with a loss of normal feedwater, a Turbine trip within 30 seconds will maintain S/G inventory.
- C. The safeguards systems are designed assuming that the only heat being added to the NC system is from less than 5% power. If the reactor will not trip, then the rods are manually inserted to lower reactor power to less than 5%. For an ATWS event with a loss of normal feedwater, a Turbine trip within 30 seconds will maintain S/G inventory.
- D. The safeguards systems are designed assuming that the only heat being added to the NC system is from less than 5% power. If the reactor will not trip, then the rods are manually inserted to lower reactor power to less than 5%. For an ATWS event with a loss of normal feedwater, a Turbine trip within 30 seconds will prevent challenging the PZR PORV's

Distracter Analysis:.

- A. Incorrect:
Plausible:

- B. Correct:
 Plausible:
- C. Incorrect:
 Plausible:
- D. Incorrect
 Plausible:

LEVEL: RO

KA: 000029 EK1.01 (2.8/3.1)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Analysis

AUTHOR: CDC

LESSON: OP-MC-EP-FRS

OBJECTIVES: OP-MC-EP-FRS Obj 4

REFERENCES: OP-MC-EP-FRS pages 23 & 25
 EP/1/A/5000/FR-S.1 page 2

1 Pt

One of the functions of the Containment Spray System (NS) is to remove fission product iodine from the containment atmosphere during a design basis LOCA.

Which one (1) of the following describes how and when this is accomplished?

- A. During the Injection phase by providing a spray of cold and subcooled borated water from the FWST into the upper containment volume.**
- B. During the Injection phase by providing a spray of water with an alkaline pH from the containment sump into the upper containment volume.**
- C. During the Recirculation phase by providing a spray of cold and subcooled borated water from the FWST into the upper containment volume.**
- D. During the Recirculation phase by providing a spray of water with an alkaline pH from the containment sump into the upper containment volume.**

Distracter Analysis:.

- A. Incorrect:
Plausible:**
- B. Incorrect:
Plausible:**
- C. Incorrect:
Plausible:**
- D. Correct
Plausible:**

LEVEL: RO

KA: 027 K1.01 (3.4/3.7)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Memory

AUTHOR: CDC

LESSON: OP-MC-ECC-NS

OBJECTIVES: OP-MC-ECC-NS Obj 1

REFERENCES: OP-MC-ECC-NS page 11
MNS Technical Specifications Bases for T.S. 3.6.6
Containment Spray System

1 Pt

Given the following conditions on Unit 1:

- RTP is 100%
- 'B' train is in operation
- CF&E sump HI level alarm is lit.
- All NC Pump Motor Bearing LO KC flow annunciators are lit.
- All NC Pump upper Motor Bearing temperatures are trending up.
- "B" NC Pump Upper Motor Bearing temperature is 197 degrees.
- AP-21(Loss of KC or KC System Leakage) has been implemented.

Which one (1) of the following describes the operator's response to "B" NCP Upper Motor Bearing HI temperature?

AP/1/A/5500/21 Loss KC

- A. Close 1NC-29 (*B Loop PZR Spray Control*), trip the reactor, stop "B" NC Pump and go to EP/1/A/5000/E-0
- B. Trip the reactor, stop "B" NC Pump and go to EP/1/A/5000/E-0
- C. Trip the reactor, trip all NC Pumps and go to EP/1/A/5000/E-0
- D. Close 1NC-29, trip the reactor, trip all NC Pumps and go to EP/1/A/5000/E-0

Distracter Analysis:.

- A. Incorrect:
Plausible:
- B. Incorrect:
Plausible:
- C. Correct:
Plausible:
- D. Incorrect
Plausible:

LEVEL: RO

KA: 000026 G2.4.47 (3.4/3.7)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Analysis

AUTHOR: CWS

LESSON: OP-MC-AP-21

OBJECTIVES: OP-MC-AP-21 Obj 4

REFERENCES: OP-MC-AP-21 page 4

1 Pt

Given the following conditions on Unit 1:

- Medium size LOCA has occurred with valid Ss, St and Sp signals
- S/I termination criteria are satisfied
- One NV pump has been secured
- Both NI pumps have been secured
- Both ND pumps have been secured
- Pzr Spray valves are closed

Pressurizer level is 25% and decreasing. Which one of the following describes the correct operator actions?

*REFERENCE PROVIDED:
ES 1.1*

- A. **Restart S/I pumps and realign NV S/I flowpath as necessary to restore subcooling and level, GO TO EP/1A/5000/E-1 (*Loss of Reactor or Secondary Coolant*).**
- B. **Go to EP/1A/5000/ES 1.2 (*Post LOCA Cooldown and Depressurization*).**
- C. **Go directly to EP/1A/5000/ES-0.0 (*Radiagnosis*).**
- D. **Reinitiate Safety Injection and GO TO EP/1A/5000/E-0 (*Reactor Trip or Safety Injection*).**

Distracter Analysis:.

- A. **Correct:**
Plausible:
- B. **Incorrect:**
Plausible:
- C. **Incorrect:**
Plausible:
- D. **Incorrect**
Plausible:

LEVEL: RO

KA: W/E-2 EK2.2 (3.5/3.9)

SOURCE: NEW

LEVEL OF KNOWLEDGE: ANALYSIS

AUTHOR: CWS

LESSON: OP-MC- EP-E-1

OBJECTIVES: OP-MC-EP-E-1 Obj. 4

REFERENCES: OP-MC-EP-E-1 pages 65 & 67
EP/1/A/5000/ES-1.1

- 1 Pt. The SRO instructs the Unit 1 RO to adjust NC Pump seal leak off flow by cooling the VCT. The potentiometer on 1KC-132 (*Letdown Heat Exchanger Outlet Temperature Control*) was adjusted to lower VCT temperature 6 degrees.

Which one of the follow is the correct plant response to this adjustment?

- A. VCT temperature decreases
 KC pump flow decreases
 KC pump discharge pressure increases
 NC temperature increase
 Main Steam pressure increases.
- B. VCT temperature decreases
 KC Pump flow increases
 KC Pump discharge pressure decreases
 NC temperature decrease
 Main Steam pressure decreases
- C. VCT temperature decreases
 KC Pump flow increases
 KC Pump discharge pressure decreases
 NC temperature increase
 Main Steam pressure increases
- D. VCT temperature decreases
 KC Pump flow decreases
 KC Pump discharge pressure increases
 NC temperature decreases
 Main Steam pressure decreases

Distracter Analysis:.

- A. Incorrect:
 Plausible:
- B. Incorrect:
 Plausible:
- C. Correct:
 Plausible:
- D. Incorrect
 Plausible:

LEVEL: RO

KA: SYS 008 A4.06 (2.5*/2.5)

SOURCE: NEW

LEVEL OF KNOWLEDGE: ANALYSIS

AUTHOR: CWS

LESSON: -

OBJECTIVES:

REFERENCES: OP/1A/6200/001 B page 1 & 2

1 Pt.

Given the following conditions on Unit 1:

- ORANGE Path on Core Cooling
- RED Path on Heat Sink

Which one of the following describes why Red path on Heat Sink is addressed prior to the Orange Path on Core Cooling?

- A. A Red path indicates the CSF is under severe challenge and prompt operator action is required.
- B. A Red path indicates the CSF is not satisfied and operator action may be taken.
- C. Heat Sink has a higher priority than Core Cooling due to position on status trees.
- D. A Red path indicates the CSF is under extreme challenge and immediate operator action is required.
-

Distracter Analysis:.

- A. Incorrect:
Plausible:
- B. Incorrect:
Plausible:
- C. Incorrect:
Plausible:
- D. Correct Answer
Plausible:

LEVEL: RO**KA:** G2.4.22 (3.0/4/0)**SOURCE:** NEW**LEVEL OF KNOWLEDGE:** Memory**AUTHOR:** CWS**LESSON:** OP-MC- EP-INTRO**OBJECTIVES:** OP-MC-EP-E-1 Objs. 1 & 3

REFERENCES: OP-MC-EP-INTRO pages 21,27,29

1 Pt.

Unit 1 is in the process of cooling down to Mode 5 to enter refueling outage.

- Steam dumps in Steam Pressure Mode with Steam Dump Controller in Manual
- 15 minutes after cooldown has begun from 557 degrees steam dumps close.

Which one of the following describes the correct reason the steam dumps closed?

- A. Potentiometer set too high on Steam Dump Controller.**
- B. Cooled down to P-12.**
- C. C-7A not reset.**
- D. Tave and Tref deviation is less than 3 degrees.**

Distracter Analysis:.

- A. Incorrect:** POT has no effect in manual steam dump control
Plausible:
- B. Correct:**
Plausible:
- C. Incorrect:** No effect
Plausible: condition required to arm steam dumps when in Tave mode
- D. Incorrect:** No effect
Plausible: On a load rejection must have greater than 3 degrees for banks to start modulating

LEVEL: RO

KA: G 2.2.2 (3.5/3.9)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Memory

AUTHOR: CWS

LESSON: OP-MC-STM-IDE

OBJECTIVES: OP-MC- STM-IDE Obj. 10

REFERENCES: OP-MC-STM-IDE pages 35-49 odd only

1 Pt.

Given the following conditions on Unit 1:

- RN system is in normal alignment
- RN pump 'B' is running
- RV pumps are in normal alignment
- Unit 1 experiences a Safety Injection

Which one of the following describes the cooling water supply provided to lower containment ventilation loads?

- A. 'A' RN pump
- B. 'B' RN pump
- C. RV pump in AUTO that starts on low non-essential header pressure.
- D. RV pump in AUTO that starts on safety injection signal.

Distracter Analysis:. 1RN-42A closed on S/I. Lose RN flow to non essential headers. RV pump in AUTO will start on low non essential header pressure. Operator needs to know S/I alignment for RN and when RV pumps start to answer question.

- A. Incorrect:
Plausible:
- B. Incorrect:
Plausible:
- C. Correct:
Plausible:
- D. Incorrect
Plausible:

LEVEL: RO**KA:** SYS 076 A1.02 (2.6*/2/6*)**SOURCE:** NEW**LEVEL OF KNOWLEDGE:** Memory**AUTHOR:** CWS

LESSON: OP-MC- CNT-RV

OBJECTIVES: OP-MC-CNT-RV Obj. 10

REFERENCES: OP-MC-CNT-RV pages 13 & 25
OP/0/A/6400/009 Enclosure 4.1
OP-MC-PSS-RN page 75

- 1 Pt(s) Unit 1 is in the process of releasing the Ventilation Unit Condensate Drain Tank (VUCDT) using approved station procedures. Just after the release was initiated, the 1EMF-44 (Ventilation Unit Condensate Drain Tank) power supply fails.

Which one of the following statements correctly describes the effect on this Liquid Waste Release (LWR)?

REFERENCE PROVIDED

SLC 16.11.2

- A. 1EMF-44 fails in the conservative direction and both Trip 1 and Trip 2 alarm, terminating the release. The high radiation alarms can not be reset and the release can not be continued.
- B. 1RAD2-F/2, 'EMF-44 LOSS OF CONT VENT DRN TNK SAMPLE FLOW' alarms and the release must be terminated.
- C. 1EMF-44 will alarm Trip 1 and Trip 2 terminating the release. The Trip 2 alarm may be reset only one time, if no further alarms are received. The LWR may proceed provided that station RP performs an analysis of grab samples for radioactivity at a lower limit of detection.
- D. Nothing, there is no effect on this LWR. The LWR may proceed provided that station RP performs an analysis of grab samples for radioactivity at a lower limit of detection.

Distracter Analysis:

- A. **Incorrect:** The hi rad alarms will not be received upon loss of power supply.
Plausible: Some bistables and alarms 'fail on' when power is lost or detectors fail.
- B. **Incorrect:** The LOSS OF SAMPLE FLOW will alarm.
Plausible: There is an alarm for loss of sample flow, but there is not an alarm for loss of power.
- C. **Incorrect:** The hi rad alarms will not be received.
Plausible: Some hi rad alarms may be reset one time to reinitiate the LWR without additional sampling or LWR paperwork.
- D. **Correct:**

Level: RO

KA: SYS 073 A2.02 (2.7/3.2)

Lesson Plan Objective:

Source: New

Level of knowledge: comprehension

References:

1. 1RAD2-F/2 Annunciator Response Procedure
2. SLC 16.11.2

1 Pt.

Given the following conditions:

- Unit 1 is in a refueling outage.
- Fuel movement is in progress.
- The Spent Fuel Pool Level Low computer alarm has actuated.
- Initially 1EMF 17 (SPENT FUEL BLDG. REFUEL. BRDG) was reading radiation 7 mrem/hr.
- After 20 minutes 1EMF-17 is 18 mrem/hr.

Which one (1) of the following describes the operator response to the current conditions?

- A. **Begin makeup to the pool from the Boric Acid Tank to restore level.**
 - B. **Move the fuel transfer cart to the reactor side and close 1KF-122 (*Fuel Transfer Tube Block Valve*).**
 - C. **Move the fuel transfer cart to the spent fuel (pit) side and close 1KF-122 (*Fuel Transfer Tube Block Valve*).**
 - D. **Place the weir gate in position and inflate the seals.**
-

LEVEL: SRO**SOURCE:** BANK**LEVEL OF KNOWLEDGE:** Memory**REFERENCES:** OP-MC-FH-FC pages 19-25 odd only**LESSON:** OP-MC-FH-FC**OBJECTIVE:** OP-MC-FH-FC Obj. 6**K/A:** 036 AA2.02 (3.4/4/1)

1 Pt. Unit 1 is in mode 4.

Given the following conditions:

- (1) Surveillance testing has been recently completed on the ice condenser
- (2) The surveillance test was not satisfactory as described below

Which one (1) of the following situations meets the requirements for a one hour Tech Spec LCO?

- A. The ice condenser door position monitoring system was declared inoperable when one door did not indicate in the open position during a surveillance test. The door was left in the open position.**
- B. The ice bed was declared inoperable when it was determined that it failed a surveillance test based on total ice weight less than 2,099,790 pounds at a 95% level of confidence.**
- C. The Ice Bed Temperature Monitoring System was declared inoperable when it failed a Tech Spec surveillance test - channel check failure.**
- D. The ice condenser intermediate deck door was declared inoperable when it was discovered to be obstructed from opening by ice and debris.**

LEVEL: SRO

SOURCE: BANK

REFERENCES: Tech Spec 3.6.13

LESSON: OP-MC-CNT-NF

OBJECTIVE: OP-MC-CNT-NF Obj. 21

K/A: SYS 025 G2.2.22 (3.4/4.1)

LEVEL OF KNOWLEDGE: Memory

Bank Question: 207.1**Answer: C**

1 Pt.

Unit 1 is preparing for a reactor start up following a refueling outage. Given the following conditions:

- $T_{avg} = 515\text{ }^{\circ}\text{F}$
- Plant heatup in progress using NCPs

At 0200, a Station Engineer reports that a mistake had been made in analyzing the containment Appendix J Leak Rate Test results that were conducted prior to exceeding 200 °F in mode 5. Reanalysis indicated that the combined containment leak rate (Type A) had exceeded 1.0 L_a.

Which one of the following actions are required by Tech Specs in response to this situation?

REFERENCES PROVIDED
Tech Spec 3.6.1 and Bases

- A. Commence a plant cooldown to reach mode 5 within 36 hours.
 - B. Commence a plant cooldown to reach mode 5 within 37 hours.
 - C. Commence a plant cooldown to reach mode 5 within 42 hours.
 - D. Commence a plant cooldown to reach mode 5 within 43 hours.
-

Distracter Analysis:

- A. Incorrect:
Plausible:
- B. Incorrect:
Plausible:
- C. Correct:
Plausible:
- D. Incorrect
Plausible:

SOURCE: BANK**LEVEL:** SRO**LEVEL OF KNOWLEDGE:** ANALYSIS**KA:** SYS 103 A2.01 (2.0*/2.6)

OBJECTIVES: OP-MC-ADM-TS Obj. 2

REFERENCES: Tech Spec 3.6.1 and Bases
OP-MC-ADM-TS pages 29, 31

Bank Question: 338.1**Answer: C**

1 Pt

Which one of the following statements complies with the requirements of OMP 4-3 (*EP/AP Implementation Guidelines*) regarding the rules of usage for abnormal procedures (APs) when the emergency procedures (EPs) have been implemented?

- A. APs may not be implemented when EPs have been entered.
- B. Only one AP at a time may be implemented when EPs have been implemented. Concurrent implementation of APs when EPs are in use is not allowed.
- C. APs may be implemented concurrently with EPs. However, the APs were written assuming that SI has not actuated and operators must be careful when using APs if SI has occurred.
- D. APs may be implemented concurrently with EPs with the exception of events where SI has actuated. APs were written assuming the SI had not occurred and cannot be used if SI has actuated.

Distracter Analysis:

- A. **Incorrect:** APs may be entered after EOPs have been started
Plausible: Many plants have this provision - symptomatic EOPs should address all significant safety challenges without requiring APs
- B. **Incorrect:** No limitation on the number of APs
Plausible: Makes sense to limit the number of concurrent procedures in use
- C. **Correct answer**
- D. **Incorrect:** No explicit prohibition against use of APs when SI has actuated BUT there is a caution and the APs were written for the situation where SI has NOT occurred.
Plausible: APs were written for the situation where SI has NOT occurred.

LEVEL: SRO**SOURCE:** BANK**LEVEL OF KNOWLEDGE:** Memory**KA:** G 2.4.5 (2.9/3.6)

REFERENCE: OMP 4-3 pages 21 & 22

Bank Question: 697.3**Answer: C**

1 Pt.

Unit 2 is operating at 100% power. 2NI-59 (Cold Leg Accumulator Check Valve) begins to leak at 0200. Given the following accumulator indications:

<u>Time</u>	<u>0200</u>	<u>0300</u>	<u>0400</u>	<u>0500</u>
Level (%)	21%	31%	41%	51%
Pressure (psig)	586	611	636	661
Boron (ppm)	2500	2490	2480	2470

When does the accumulator first exceed a limiting condition for operation?

REFERENCES PROVIDED:**Tech Spec 3.5.1****Unit 1 Data Book curve 7.4****Unit 1 Cycle 16 COLR – page 24**

- A. 0200
- B. 0300
- C. 0400
- D. 0500

Distracter Analysis: Tech Spec values for CLA parameters are:

Volume ≥ 6870 (12.3%) but ≤ 7342 gal (38.7%) – exceeded at 0400 (high)

Pressure ≥ 585 but ≤ 639 psig – exceeded at 0400

Boron concentration ≥ 2475 ppm but ≤ 2875 ppm – exceeded at 0300

- A. **Incorrect Answer:** nothing out of spec.
- B. **Incorrect:** nothing out of spec
Plausible:
- C. **Correct:** the LCO is first exceeded at 0400 on accumulator level
Plausible:
- D. **Incorrect:** the LCO is first exceeded at 0400 on accumulator level
Plausible:

Level: SRO

KA: G2.1.25 (2.8/3.1)

Lesson Plan Objective: ECC-CLA Obj. 7

Source: Bank

Level of knowledge: comprehension

References:

1. OP-MC-ECC-CLA page 23
2. Tech Spec 3.5.1 - PROVIDED
3. Unit 1 Data Book Curve 7.4 - PROVIDED
4. Unit 1 Cycle 15 COLR - PROVIDED

Bank Question: 776.1**Answer: B**

1 Pt.

Unit 1 was operating at 100% when a large break LOCA with loss of offsite power occurs. One diesel generator fails to start. The operators are entering E-1 (*Loss of Reactor or Secondary Coolant*).

Given the following critical safety function status indications:

- Core Cooling – RED
- Subcriticality – GREEN
- Containment – RED
- Inventory - GREEN
- Heat Sink – RED
- Integrity – RED

Which one of the following describes the highest priority problem, and the appropriate operator action?

- A. **Integrity; Transition to FR-P.1, (*Response to Imminent Pressurized Thermal Shock*).**
- B. **Core cooling; Transition to FR-C.1, (*Response to Inadequate Core Cooling*).**
- C. **Heat Sink; Transition to FR-H.1, (*Response to Loss of Secondary Heat Sink*).**
- D. **Containment; Transition to FR-Z.1, (*Response to High Containment Pressure*).**

Distracter Analysis:

- A. **Incorrect:** Core Cooling is the highest priority RED
Plausible:
- B. **Correct:**
Plausible:
- C. **Incorrect:** core cooling is the highest priority RED
- D. **Incorrect:** core cooling is the highest priority RED
Plausible:.

Level: SRO

KA: WE 07 EA 2.1 (3.2/4.0)

Lesson Plan Objective: EP-F0 SEQ 2, 3

Source: Bank

Level of knowledge: Memory

References:

1. OP-MC-EP-F0 pages 13, 15
2. OMP 4-3 pages 15-16

Bank Question: 892.3**Answer: A**

1 Pt.

Unit 1 is operating at 100% power when the OAC registers a low spent fuel pool level alarm. Given the following events and conditions:

- The operators read –2.1 ft SFP level and stable on the main control board.
- The operating KF pump has tripped.
- An NLO reports a large leak in the auxiliary building has stopped.
- Normal SFP makeup is not available.

Which one of the following statements correctly describes the corrective action for this event?

- A. **Implement AP/1/A/5500/41 (*Loss of Spent Fuel Cooling or Level*), find and isolate the leak on the KF discharge piping.**
- B. **Implement AP/1/A/5500/41 (*Loss of Spent Fuel Cooling or Level*), find and isolate the leak on the KF suction piping.**
- C. **Implement AP/1/A/5500/21 (*Loss of KC or KC System Leakage*), and initiate assured makeup due a leak on the discharge piping.**
- D. **Implement AP/1/A/5500/21 (*Loss of KC or KC System Leakage*), and initiate assured makeup due to a leak on the suction piping.**

Distracter Analysis:

- A. **Correct:**
- B. **Incorrect:** The leak is on the discharge piping.
Plausible: If the candidate confuses the piping immersion depth with the suction pipes, which are at 4 feet.
- C. **Incorrect:** KF leak not a KC leak
Plausible:.
- D. **Incorrect:** Do not use the assured source, and the leak is on the discharge piping.
Plausible:.

Level: SRO

KA: SYS 033 A2.02(2.7/3.0)

Lesson Plan Objective: OP-MC-FH-KF Obj. 4/5/14

Source: BANK

Level of knowledge: Comprehension

References:

1. OP-MC-FH-KF pages 19, 23, 49

Bank Question: 894 .2

Answer: A

1 Pt.

Unit 2 is operating at 100 % power. Given the following events and conditions:

- "B" essential train components are in service.

The Test Group Supervisor comes to you the Control Room SRO and wants to perform valve stroke testing.

Which one of the following valves would you **NOT** allow testing?

- A. 0RN-1 (*LLI Supply to RN*)
 - B. 2RN-40A (*Train A to Non- Ess Hdr Isol*)
 - C. 0RN-7A (*Train 1A & 2A SNSWP Supply*)
 - D. 2RN-64A (*AB Non-Ess Return Isol*)
-

Distracter Analysis:

- A. Correct: .
- B. Incorrect: .
Plausible: .
- C. Incorrect: .
Plausible: .
- D. Incorrect: .
Plausible: .

Level: SRO

KA: APE 062 AA2.0(2.9/3.6)

Lesson Plan Objective: PSS-RN Obj 7

Source: Bank

Level of knowledge: comprehension

References:

1. OP-MC-PSS-RN pages 23, 41, 73, 85
2. OP-MC-PSS-KC page 39

1 Pt.

Which one of the following is a correct list of SAFETY LIMITS?

- A. Thermal Power, RCS Highest Loop Tave and Pressurizer Pressure.**
 - B. Thermal Power, AFD, Pressurizer Pressure.**
 - C. AFD, QPTR and Reactor Power.**
 - D. Linear Heat Generation Rate, Thermal Power and QPTR.**
-

Distracter Analysis:

- A. Correct:
Plausible:**
- B. Incorrect:
Plausible:**
- C. Incorrect:**
- D. Incorrect:
Plausible:**

Level: SRO Only

KA: G 2.1.10 (2.7/3.9)

Lesson Plan Objective: (None)

Source: New

Level of knowledge: memory

References:

1. Tech Spec 2.1.1

1 Pt.

Unit 1 has experienced a 50% load rejection which resulted in Control Bank "D" Group 1 being greater than 12 steps misaligned from its associated step counter. Tech Spec 3.1.4 Rod Control Group Alignment Limits states:

"All shutdown and control rods shall be OPERABLE; with all individual indicated rod positions within 12 steps of their group step counter demand position".

Which one of the following is the bases for this Tech Spec?

- A. Ensure SDM limits are maintained and QPTR is maintained within limits.
- B. Ensure power distribution and SDM limits are preserved.
- C. Ensure QPTR is maintained within limits and rod alignments are correct.
- D. Ensure AFD is maintained and limit power distribution.

Distracter Analysis:

- A. Incorrect:
Plausible:
- B. Correct:
- C. Incorrect:
Plausible:
- D. Incorrect:
Plausible:

Level: SRO

KA: G2.2.25 (2.5/3.7)

Lesson Plan Objective: OP-MC-IC-IRX Obj. 14

Source: BANK

Level of knowledge: Memory

References:

1.T.S. 3.1.4 Bases

1 Pt. Unit 1 is operating at 100% power when the following occurs:

- LOCA outside containment
- The leak can not be isolated
- Containment Sump Level is Normal
- FWST level is 178"
- FWST has not ruptured

Which of the following procedures would be used to MITIGATE the event?

- A. ECA-1.1 (*Loss of Emergency Coolant Recirc*)**
- B. ECA-1.2 (*LOCA Outside Containment*)**
- C. ES-1.2 (*Post LOCA Cooldown and Depressurization*)**
- D. ES-1.3 (*Transfer to Cold Leg Recirc*)**

Distracter Analysis:

- A. Correct –**
- B. Incorrect.**
- C. Incorrect**
- D. Incorrect**

Level: SRO

KA: EPE W/E11 EA2.1 (3.4/4.2)

Lesson Plan Objective: OP-MC-EP-E1 Obj. 6

Source: New

Level of knowledge: Analysis

Author: CWS

References:

1. OP-MC-EP-E1 page 157
2. ES 1.3 Transfer to Cold Leg Recirc.

1 Pt.

Given the following conditions:

- Pressurizer Level Channel 1 is at 28% level
- Pressurizer Level Channel 2 associated bistables are in the tripped condition due to surveillance testing
- Pressurizer Level Channel 3 fails high.
- N-41 is 8%
- N-42 is 10%
- N-43 is 9%
- N-44 is 9%
- Impulse pressure channel 1 is 11%
- Impulse pressure channel 2 is 9%
- No reactor trip has occurred

Which of the following describes the proper operator response?

- A. Trip the reactor and enter E-0 (*Reactor Trip or Safety Injection*)**
- B. Trip the reactor and enter FR-S.1 (*Response Nuclear Power Generation/ATWS*)**
- C. Do not trip the reactor because thermal power is less than P-7**
- D. Do not trip the reactor. Initiate unit shutdown.**

Distracter Analysis:

- A. Incorrect: – This example is not a valid ATWS event. This is a loss of reactor protection. Therefore you do not trip the reactor.**
- B. Incorrect: This example is not a valid ATWS event. This is a loss of reactor protection. Therefore you do not trip the reactor.**
- C. Incorrect: Greater than P-7. Pzr Hi level trip is in effect**
- D. Correct**

Level: SRO

KA: APE 029 EA2.02 (4.2/4.4)

Lesson Plan Objective: OP-MC-IC-IPE Obj. 10 & 11

Source: New

Level of knowledge: Analysis

Author: CWS

References:

1. OP-MC-IC-IPE pages 47, 79 & 81
2. OMP 4-3 page 9

1 Pt.

Given the following conditions on Unit 1:

- A steam leak has occurred on the main steam header
- Unit 1 reactor has been tripped and safety injection has actuated
- The MSIVs will not close
- 20 minutes into the event lowest loop NC Tcold is 305 degrees

Based on the above conditions which one of the following is the correct procedure flowpath?

- A. From E-0 Reactor Trip or Safety Injection GO TO FR-P.2
(Response to Anticipated Pressurized Thermal Shock)**
- B. From E-0 go directly to ECA 2.1, (Uncontrolled
Depressurization of all Steam Generators)**
- C. From E-0 GO TO FR-P.1, (Response to Imminent Pressurized
Thermal Shock)**
- D. From E-0 GO TO E-2, (Faulted Steam Generator Isolation) and
then to ECA 2.1**

Distracter Analysis:

- A. Incorrect:
Plausible:**
- B. Incorrect:
Plausible:**
- C. Incorrect:
Plausible:**
- D. Correct
Plausible:**

LEVEL: SRO**KA: W/E12 EA2.1 (3.2/4.0)****SOURCE: NEW****LEVEL OF KNOWLEDGE: Comprehension****AUTHOR: CWS****LESSON: OP-MC-EP-E2**

OBJECTIVES: OP-MC-EP-E2 Obj 2,6

REFERENCES: OP-MC-EP-E2 pages 9, 15 & 23
EP/1/A/5000/F-0 page 7
EP/1/A/5000/E.2 page 2

1 Pt.

Given the following conditions on Unit 1:

- Chemistry had confirmed two leaking fuel rods
- A large break LOCA occurs
- E-0 *Reactor Trip or Safety Injection* is complete
- ES-1.3 *Transfer to Cold Leg Recirc* is complete
- E-1 *Loss of Reactor or Secondary Coolant* is complete
- ES-1.2 *Post LOCA Cooldown and Depressurization* is in effect.
- All Red and Orange Paths have been addressed
- 1EMF 51A is reading 39R/HR
- Pressurizer level is 0%

The SRO is currently considering implementing Yellow Path procedures. Which one of the following describes proper procedure implementation?

- A. **Go to FR-I.3, (*Response to Voids in the Reactor Vessel*) and exit ES-1.2**
- B. **Stay in ES-1.2 and implement FR-I.3 concurrently**
- C. **Go to FR-Z.3, (*Response to High Containment Radiation Level*) and exit ES-1.2**
- D. **Stay in ES-1.2 and implement FR-Z.3 concurrently**

Distracter Analysis:.

- A. **Incorrect:** ES1.2 is the controlling procedure and not to be exited
Plausible:
- B. **Incorrect:** FR-I-3 is a lower priority than FR-Z-3
Plausible:
- C. **Incorrect:** ES1.2 is controlling procedure
Plausible:
- D. **Correct**
Plausible:

LEVEL: SRO**KA:** W/E16 EA2.1 (4.3/4.4)**SOURCE:** NEW**LEVEL OF KNOWLEDGE:** Analysis

AUTHOR: CWS

LESSON: OP-MC-EP-F0

OBJECTIVES: OP-MC-EP-F0 Obj 3

REFERENCES: OP-MC-EP-F0 page 17
OMP 4-3 page 19

1 Pt(s)

Given the following conditions on Unit 1:

- Mode 3
- NC System is at 1700 psig and 450 degrees
- In process of cooling down and depressurizing the NC System
- Safety Injection has occurred
- NC Pressure going down in an uncontrolled manner
- Containment pressure going up in uncontrolled manner

Which one of the following describes the proper procedures to mitigate the above?

- A. Enter AP/35 (*ECCS Actuation During Plant Shutdown*) and then go to E-0 (Reactor Trip or Safety Injection).
- B. Enter E-0 and then go to AP/35
- C. Enter AP/35 and then go to AP/34 (Shutdown LOCA)
- D. Enter E-0 and then go to E-1 (*Loss of Reactor or Secondary Coolant*).

Distracter Analysis:.

- A. Correct:
Plausible:
- B. Incorrect:
Plausible:
- C. Incorrect:
Plausible:
- D. Incorrect
Plausible:

LEVEL: SRO

KA: 006 G 2.4.4 (4.0/4.3)

SOURCE: NEW

LEVEL OF KNOWLEDGE: ANALYSIS

AUTHOR: CWS

LESSON: - AP/1/5500/35 Background Document

OBJECTIVES: OP-MC-AP-35 Obj. 1
MC-AP-34 Obj. 1

REFERENCES: AP/1/5500/35 Background Document pages 2-4
AP/1/A/5500/35 page 3
AP/34 Backdground Document page 2

1 Pt

Given the following conditions on Unit 1:

- Unit 1 is at 100% power.
- 'A', 'B', and 'C' VL AHU are running
- 'A' and 'C' VL AHUs have tripped and will not restart
- Attempts to start 'D' VL AHU were unsuccessful
- Average temperature in lower containment for past 365 days has been 105 degrees.
- Maintenance indicated it will take two days to repair the VL AHUs.
- Containment lower compartment temperature is 126 degrees and steady.

Which one (1) of the following describes the required Technical Specification actions to address the high containment temperature?

Reference Provided Tech Spec 3.6.5

- A. **Restore temperature to within limits in 8 hours.**
- B. **Reduce temperature to <125 degrees in 72 hours.**
- C. **No action is required to address high containment temperature.**
- D. **Be in Mode 3 in 14 hours.**

Distracter Analysis:

- A. **Incorrect:**
Plausible:
- B. **Incorrect:**
Plausible:
- C. **Correct:**
Plausible:
- D. **Incorrect**
Plausible:

LEVEL: SRO

KA: SYS 022 G2.1.12 (2.9/4.0)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Analysis

AUTHOR: CWS

LESSON: OP-MC-CNT-VUL

OBJECTIVES: OP-MC-CNT-VUL Obj. 11

REFERENCES: OP-MC-CNT-VUL pages 15 & 17
Tech Spec 3.6.5

1 Pt.

Given the following conditions on Unit 1:

- In Mode 5 cooling down for a refueling outage.
- The '1B' ND pump tripped due to an electrical fault.
- The '1A' ND pump has been started per AP/1/A/5500/19 (*Loss of ND or ND System Leakage*) Encl. 14 (*Startup of ND Pumps*)
- NC temperature before the pump trip was 150 degrees
- NC temperature has increased to 207 degrees.
- AP/1/A/5500/19 (*Loss of ND*) is in effect

The SRO instructs the RO to cooldown to the pre-event temperature.

Which one (1) of the following describes the maximum cooldown rate and minimum flow rate allowed to cooldown?

REFERENCES PROVIDED
AP/1/A/5500/19 Encl 14
DATA BOOK Encl. 4.3, curve 1.6b

- A. Maximum cooldown rate of 50 degrees/hr and minimum flow rate of 1500 gpm.
- B. Maximum cooldown rate of 75 degrees/hr and minimum flow rate of 1000 gpm
- C. Maximum cooldown rate of 50 degrees/hr and minimum flow rate of 2000 gpm.
- D. Maximum cooldown rate of 75 degrees/hr and minimum flow rate of 1500 gpm.

Distracter Analysis:.

- A. Incorrect:
Plausible:
- B. Incorrect:
Plausible:
- C. Incorrect:
Plausible:
- D. Correct
Plausible:

LEVEL: SRO**KA:** 000025 AA2.05 (3.1*/3.5*)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Analysis

AUTHOR: CWS

LESSON: OP-MC-AP-19

OBJECTIVES: OP-MC-AP-19 Obj 2

REFERENCES: AP-19 Background Document Enclosure 14
AP/1A/5500019 Enclosure 14 Provided
DATA Book Enclosure 4.3 Provided

SUMMARY FOR ENCLOSURE 14, STARTUP OF ND PUMPS

This enclosure attempts to get a ND Pump started under various potential plant conditions. If a loss of VI has occurred, then numerous compensatory actions are needed and rather than complicate this enclosure, a kickout is provided to a separate enclosure for that plant condition.

A couple of system checks are performed prior to starting an ND train. ND-35 is check closed to prevent an inadvertent inventory loss (may have been opened as a makeup option). If open, an operator is dispatched to stand by so it can be closed prior to pump start.

A step is provided to leave ND L/D in service if the NC System is solid. The setpoint for checking if NC solid is 96% Pzr level, which includes 4% instrument error. Note there still may be some volume above just full indicated level (dome of Pzr), but that amount can't be assumed to be available.

If SI has occurred then control of RN modulating valves is reestablished. Then direction is provided to go the section of the enclosure to start the desired ND Pump.

In preparation for starting a ND Pump, the local pump discharge is setup 2 turns open to prevent water hammer concerns. Pump support conditions are established (RN & KC) and ND-35 is closed at this time, if required. ND suction from the loop is aligned, and ND flow bypassing the ND Hx is aligned. The ND recirc valve is de-energized prior to starting pump to prevent any air that may be in the ND Hx from returning to the pump suction.

Several precautions are taken on ND Pump startup addressing voiding concerns. If air entrainment or voiding has occurred, a cue is provided to continue makeup as required, considering void collapse may occur after pump start. Also, a check is made for subcooling. If subcooling can't be restored, FW-27A is aligned open in conjunction with the loop suction valves until after pump start. Once NC System subcooling restored (should happen quickly with the cool FWST water mixed in), FW-27A is closed.

After the ND Pump is started, ND flow is carefully established using ND Pump discharge valve and ND-34, and then flow through the ND Hx is carefully established to maintain NC temperature (considering NC System cooldown limits). A cue is also provided to secure "feed & bleed" when less than 200°F, if it had been established. Finally, a cue is provided to flush the idle ND train if air entrainment may have occurred on it.

1 Pt.

As a result of thunderstorms Unit 2 has experienced a Loss of Offsite Power and Reactor trip. E-0 (*Reactor Trip or Safety Injection*) was implemented and the crew has transitioned to ES-0.1 (*Reactor Trip Response*).

The SRO asks the RO to check NC temperatures.

Which one (1) of the following would the RO use to describe the response of the NC system?

- A. NC Tave STABLE or trending to 557 degrees
- B. NC T hots STABLE or trending to 553 degrees
- C. NC T colds STABLE or trending to 557 degrees
- D. NC Tave STABLE or trending to 553 degrees.

Distracter Analysis: The reactor coolant pumps have tripped in this scenario. Tave is only checked if the NC pumps are on. T hot should be increasing initially on the establishment of natural circulation. T colds will go to 557. 553 degrees is a commonXl used number for steam dump P-12.

- A. Incorrect:
Plausible:
- B. Incorrect:
Plausible:
- C. Correct:
Plausible:
- D. Incorrect
Plausible:

LEVEL: SRO

KA: 00056 AA2.32 (4.3/4.3)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Comprehension

AUTHOR: CWS

LESSON: AP/09 Background Document

OBJECTIVES:

REFERENCES: AP/09 Background Document pages 3 & 4
EP/1/A/5000/ES-0.1 page 3

1 Pt.

Radwaste is in the process of releasing WGD 'A'. 1EMF -36 L is inoperable due to PM. Trip 2 is received on 0EMF-50 (*Waste Gas Discharge*). The gaseous waste release is secured as a result of 1WG-160 closing. Radwaste calls the control room SRO and reports 0EMF-50 has been purged and is ready to reinitiate the release.

Which one (1) of the following describes the actions of the control room SRO?

- A. The SRO can authorize up to two (2) restarts without re-sampling.
- B. The SRO has Radwaste terminate the release and existing GWR paperwork, and generate new paperwork.
- C. The SRO can authorize one (1) restart without re-sampling.
- D. The SRO can authorize Radwaste to jumper control actions of 0EMF-50, restart release and take grab samples once per four (4) hours during release.

Distracter Analysis:.

- A. **Incorrect:** Would be correct if both EMF 36 and 50 were operable
Plausible:
- B. **Correct:**
Plausible:
- C. **Incorrect:**
Plausible:
- D. **Incorrect**
Plausible:

LEVEL: SRO

KA: 00060 G 2.3.8 (2.3/3.2)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Comprehension

AUTHOR: CWS

LESSON: OP-MC-WE-RGR

OBJECTIVES: OP-MC-WE-RGR Obj 5

REFERENCES: OP-MC-WE-RGR page 13

1 Pt.

Given the following conditions on Unit 1:

- SGTR in the '1A' S/G
- E-0 (*Reactor Trip or Safety Injection*) complete
- E-3 (*Steam Generator Tube Rupture*) implemented.
- Cooldown is secured due to operator exceeding Main Steam Isolation set point.

Which one (1) of the following describes how the operator continues to cooldown?

- A. **Go to Bypass Interlock on steam dumps and continue cooldown with steam dumps.**
- B. **Reset Main Steam Isolation, open MSIVs and continue cooldown with steam dumps.**
- C. **Reset Main Steam Isolation and PORVs and continue cooldown using PORVs in manual.**
- D. **Reset Main Steam Isolation and PORVs and continue cooldown using PORVs in automatic.**

Distracter Analysis:.

- A. **Incorrect:**
Plausible:
- B. **Incorrect:**
Plausible:
- C. **Correct:**
Plausible:
- D. **Incorrect**
Plausible:

LEVEL: SRO**KA: 0041 G2.4.20 (3.3/4.0)****SOURCE: NEW****LEVEL OF KNOWLEDGE: Memory**

AUTHOR: CWS

LESSON: OP-MC-EP-E3

OBJECTIVES: OP-MC-EP-E3 Obj 4

REFERENCES: OP-MC-EP-E3 pages 75,77,79
EP/1A/5500/E-3 page 19-21

1 Pt.

Given the following:

- Both Units operating at 100% power.
- 'A' train RN is operating on both units.
- Operations Test Group is performing 'B' train RN valve stroke timing.
- SRO is instructed to evaluate the consequences of stroking 0RN-284B (*Train 1B and 2B Discharge to RC*)

Which one of the following describes the consequences of allowing the technician to test this valve?

- A. No consequences due to 'A' Train RN running on both units.
 - B. Closing 0RN-284B will isolate the RN non-essential header return from Unit 2.
 - C. Closing 0RN-284B will isolate the RN non-essential header return from Unit 1.
 - D. Closing 0RN-284B will isolate RV pump discharge.
-

Distracter Analysis:.

- A. Incorrect:
Plausible:
- B. Correct:
Plausible:
- C. Incorrect:
Plausible:
- D. Incorrect
Plausible:

LEVEL: SRO**KA:** G 2.2.3 (3.1/3.3)**SOURCE:** NEW**LEVEL OF KNOWLEDGE:** Comprehension**AUTHOR:** CWS**LESSON:** OP-MC- PSS-RN**OBJECTIVES:** OP-MC-PSS.RN Obj. 8

REFERENCES: OP-MC-PSS-RN page 67

1 Pt.

Which one of the following describes the bases for prioritizing Critical Safety Functions (CSF)?

- A. The CSFs are prioritized to address challenges to the boundaries that protect the general public from exposure to radiation.
- B. The CSFs are prioritized to address design bases accidents that are described in the USFAR.
- C. The CSFs are prioritized to ensure the proper optimal response procedure is implemented.
- D. The CSFs are prioritized to address challenges to parameters that would affect operation of Engineered Safeguard Features equipment.

Distracter Analysis:.

- A. Correct:
Plausible:
- B. Incorrect:
Plausible:
- C. Incorrect:
Plausible:
- D. Incorrect
Plausible:

LEVEL: SRO

KA: G 2.4.22 (3/0/4.0)

SOURCE: NEW

LEVEL OF KNOWLEDGE: Memory

AUTHOR: CWS

LESSON: OP-MC- EP-INTRO

OBJECTIVES: OP-MC-EP-E-1 Obj. 1 & 3

REFERENCES: OP-MC-EP-INTRO pages 21, 27, 29

1 Pt(s)

After Channel 1 7300 Process Control Cabinet Channel Operability Test was completed the Unit 1 Pressurizer level master malfunctions causing it to demand full output while in automatic.

Which one of the following statements correctly describes the basis for the McGuire limit on flow?

- A. Letdown flow rates in excess of 135 gpm are limited to ensure proper demineralizer operation and adhere to the design limits of the letdown piping.
- B. Letdown flow rates in excess of 120 gpm exceed the design limits of the letdown orifice valves and induce resonance vibration.
- C. Charging flow rates in excess of 100 gpm during normal operation can induce vibration in the regenerative heat exchanger tubes.
- D. Charging flow rates between 65 gpm and 100 gpm total charging flow will cause flashing in the regenerative heat exchanger.

Distracter Analysis:

- A. Incorrect:
- B. Incorrect:
Plausible
- C. Correct:
Plausible
- D. Incorrect:
Plausible:

Level: SRO

KA: APE 028 AA2.09 (2.9/3.2)

Lesson Plan Objective: OP-MC-PS-NV Obj. 13

Source: New

Level of knowledge: comprehension

References:

1. OP-MC-PS-NV pages 81 & 83

1 Pt(s)

As an SRO working on a 'Complex Maintenance Plan' you are asked to evaluate four possible work teams who must repair filter housing in a 1500 mRem/hr radiation field.

Which one of the following work teams would maintain station ALARA?

- A. A qualified male worker who has previously performed this task. He can complete this job in 20 minutes. This worker has exceeded his 'Alert' level for exposure and will require a dose extension.**
- B. Two male workers who are qualified to perform the task. Together they can perform the task in 15 minutes. Both workers have already accumulated 325 mRem this year.**
- C. A team of a female worker who is qualified to perform the task and a male worker who needs to qualify to this task. The female is a declared pregnant worker. The team will need 15 minutes to complete the task. The female has no dose and the male worker has 200 mRem for the year.**
- D. A team of a male and female both are qualified to the task but will take 20 minutes to complete the task. Each has less than 100 mRem this year.**

Distracter Analysis:

- A. Correct: 500 mR total.**
- B. Incorrect: 750 per mrem total
Plausible**
- C. Incorrect: Declared pregnant worker.
Plausible:**
- D. Incorrect: 1000 mrem total**

Level: SRO

KA: G2.3.2 (2.5/2.9)

Lesson Plan Objective: RAD RP Obj. 135

Source: New

Level of knowledge: comprehension

References:

1. OP-MC-RAD-RP page 73

1 Pt(s)

The following conditions exist on Unit 1:

- Reactor power is 100%
- 1A CA Pump is running with 1CA-60A (1A CA Pump Disch to 1A S/G Control) and 1CA-56 (1A CA Pump Disch to 1B S/G Control) closed for post maintenance testing.
- N/R level in 1B S/G increases to 84% due to 1CF-23 (1B S/G Control Valve) failing open.

Which one of the following statements correctly describes the response of the CA system to the above conditions?

- A. 1A CA Pump remains running
1B CA pump auto starts
1CA-60A and 1CA-56A fail open
1CA-44B (1B CA Pump Disch to 1C S/G Control) and 1CA-40B (1B CA Pump to Disch to 1D S/G Control) do not reposition.
Depressing the MD CA Modulating Valve Reset Train 'A' pushbutton will cause 1CA-60A and 1CA-56A to close.**
- B. 1A CA Pump remains running
1B CA pump auto starts
1CA-60A and 1CA-56A remain closed.
1CA-44B and 1CA-40B fail closed.
Depressing the MD CA Modulating Valve Reset Train 'A' pushbutton will cause 1CA-60A and 1CA-56A to open**
- C. 1A CA Pump trips
1B CA pump remains off
1CA-60A and 1CA-56A remain closed.
1CA-44B and 1CA-40B do not change position.
Depressing the MD CA Modulating Valve Reset Train 'A' pushbutton will cause 1CA-60A and 1CA-56A to open.**
- D. 1A CA Pump trips
1B CA Pump remains off
1CA-60A and 1CA-56A fail open
1CA-44B and 1CA-40B fail open.
Depressing the MD CA Modulating Valve Reset Train 'A' pushbutton will cause 1CA-60A and 1CA-56A to close.**

Distracter Analysis:

- A. Correct: .**
- B. Incorrect:
Plausible:.**
- C. Incorrect:
Plausible**
- D. Incorrect:
Plausible:.**

Level: SRO

KA: APE 054 AA204 (4.2/4.3)

Lesson Plan Objective: CF-CA Obj. # 4,
OP-MC-ECC-ISE Obj. # 13)

Source: New

Level of knowledge: comprehension

References:

1. OP-MC-CF-CA page 13,
2. OP-MC-ECC-ISE page 33