Final Submittal

CATAWBA OCTOBER 2004

EXAM 50-413, 414/2004-301
OCTOBER 4 - 8, 2004 &
OCTOBER 13, 2004 (WRITTEN)

1. Senior Operator Written Examination

U.S. Nuclear Regulatory Commission
Site-Specific
SRO Written Examination

Applicant Information

Name: MASTER EXAM KEY

Date: **October 13, 2004**	Facility/Unit: **Catawba Nuclear Station**
Region: **II**	Reactor Type: **W** / CE / BW / GE
Start Time: 0800	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination you must achieve a final grade of at least 80.00 percent. Examination papers will be collected six hours after the examination starts.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

Applicant's Signature

AUTHOR

Results

Examination Value	25	Points
Applicant's Score	_____	Points
Applicant's Grade	_____	Percent

CHANGES OR CLARIFICATIONS MADE:
1. SRO # 12

SRO Exam Reference Package – FINAL Version

References Sorted by Question Number:

Ques_093.3 - Revised Databook Figures 57 & 58; Steam Tables
Ques_618.2 - Steam Tables; Data Book Curves 57, 58
Ques_705.1 - Tech Spec 3.8.1
Ques_1143 - FR-P.1 step 18 page 20
Ques_1190.1 - RP/0/A/5000/01
Ques_1195 - Tech Spec 3.4.16 and AP-18
Ques_1206.1 - RP/0/A/5000/01

References Sorted by Title:

Revised Databook Figures 57 & 58; - Ques_093.3, Ques_618.1
Steam Tables - Ques_093.3, Ques_618.2
Tech Spec 3.8.1 – Ques_705.1
FR-P.1 step 18 page 20 - Ques_1143
RP/0/A/5000/01 - Ques_1190, Ques_1206.1
Tech Spec 3.4.16 - Ques_1195
AP-18 - Ques_1195

AP-18 - Ques_1195
FR-P.1 Step 18 page 20 - Ques_1143
Revised Databook Figures 57 & 58 - Ques_093.3, Ques_618.2
RP/0/A/5000/01 - Ques_1190, Ques_1206.1
Steam Tables - Ques_093.3, Ques_618.1
Tech Spec 3.4.16 - Ques_1195
Tech Spec 3.8.1 – Ques_705.1, Ques_1190

Bank Question: 063.1 ***Answer: A***

1 Pt(s)

Unit 1 is at 9% power conducting a power ascension to full in accordance with normal plant operating procedures. Given the following events and conditions:

- An electrical transient occurs on transformer 1A
- The fast bus transfer does not occur.
- The frequency on 1TA and 1TC dips to 55 hertz and voltage decreases to 6600V for approximately 3 seconds.

Which one of the following sequences describes:

1. The automatic plant response to this transient, and
2. The correct procedure to be implemented?

A. **1. All NCP safety breakers open but the reactor does not trip.**
2. Enter AP-04 (*Loss of Reactor Coolant Pump*) and trip the reactor.

B. **1. The A and C NCP safety breakers open and a reactor trip occurs.**
2. Enter E-0 (*Reactor Trip or Safety Injection*)

C. **1. The A and C NCP safety breakers open but the reactor does not trip.**
2. Enter AP-04 (*Loss of Reactor Coolant Pump*) and trip the reactor.

D. **1. All NCP safety breakers open and a reactor trip occurs.**
2. Enter E-0 (*Reactor Trip or Safety Injection*)

Distracter Analysis: The at-power loss of flow reactor trip is not operable below P-7 (10%) power. However, the correct action is to trip the reactor in AP-04. The NC pump monitor trip setpoint is 55 Hz and 5082 Volts.

A. **Correct**: The NCP monitor circuit sensed under-voltage or frequency on 2 of 4 sensors, resulting in all NCP breakers opening. The reactor trip does not occur because the plant is below P-7. Enter AP-04 and trip the reactor as the immediate action to step 1 RNO.

B. **Incorrect**: All NCPs trip but the reactor remains at power.
Plausible: candidate misses the 2 of 4 logic for NCP trip, and fails to realize below 10% power, all NCPs can be off without a trip occurring. If the reactor did trip – entering E-0 is the correct procedure.

C. **Incorrect**: all NCPs will trip.
Plausible: candidate knows 2 of 4 NCPs have low frequency but fails to realize all NCP breakers will open. Entering AP-04 is the correct procedural path.

D. **Incorrect**: the reactor will not trip below 10% power.
Plausible: candidate fails to realize that below P-7 the low flow trip is blocked.

Level: SRO Exam

KA: SYS 003 G2.4.6 (3.1/4.0)

Lesson Plan Objective: PS-NCP SEQ 8, 13

Source: Bank Ques_063

Level of knowledge: comprehension

References:
1. OP-CN-PS-NCP pages 19-24
2. AP-04 pages 1-2
3. OP-CN-EL-EPA page7
4. OP-CN-EL-EPB pages 7, 13-14
5. OP-CN-EL-EPC pages 7-10

KA SYS 003 Reactor Coolant Pump G2.4.6 Knowledge symptom based EOP mitigation strategies. (3.1/4.0) (CFR: 41.10 / 43.5 / 45.13)

Objective PS-NCP 8: Explain the function and operation of the NCP Monitor System.
13: State the Immediate Actions of AP/04 from memory.

Bank Question: 093.4 Answer: D

1 Pt(s) Unit 1 was operating at 100% when the unit trips due to a break on the pressurizer code safety line. Given the following events and conditions:

- Containment pressure has been slowly increasing since the break occurred.
- All criteria for SI termination are met with the exception of subcooling margin.
- Both trains of ICCM are inoperable.
- The operators are evaluating S/I termination criteria in E-1 (*Loss of Reactor or Secondary Coolant*).

Given the following parameters at the indicated times:

Time Interval	2:00	2:03	2:06
Containment Pressure (psig)	1.0	2.0	3.5
Pressurizer pressure (psig)	675	725	775
Core exit T/C temp (°F)	505	500	500
T_{hot} (°F)	500	495	495
T_{cold} (°F)	470	465	465

Which one of the following statements correctly describes the earliest time (if at all) that the operators can transition to ES-1.1 (*Safety Injection Termination*)?

REFERENCES PROVIDED: Revised Databook Figures 57 & 58; Steam Tables

A. Transition to ES-1.1 at 2:00

B. Transition to ES-1.1 at 2:03

C. Transition to ES-1.1 at 2:06

D. SI flow may be not terminated – continue monitoring S/I termination criteria.

Distracter Analysis: Step 6 of E-1 states:
Verify S/I termination criteria as follows:
a. NC subcooling based on core exit T/Cs - GREATER THAN 0°F.
b. Verify secondary heat sink as follows:
N/R level in at least one intact S/G –GREATER THAN 11% (29% ACC)

OR
Total feed flow to all intact S/Gs –GREATER THAN 450 GPM.
c. NC pressure - STABLE OR INCREASING.
d. Pzr level - GREATER THAN 11% (20% ACC).

If steam tables are used without considering instrument errors, the core is subcooled at every time step.

A. **Incorrect**: subcooling is not met > 0°F
Plausible: if the candidate uses steam tables and either Tcold or Thot to determine subcooling (without including instrument error), then subcooling margin is < 0 °F.
For 675 psig, Tsat = 502 °F (steam tables) = 485 °F (Fig 58)

B. **Incorrect**: subcooling is not met > 0 °F
Plausible: if the candidate uses steam tables and any NC system temperature to determine subcooling without including instrument error, then subcooling margin is met.
For 725 psig, Tsat = 509 °F (steam tables) = 495 °F (Fig 58)

C. **Incorrect**: subcooling is not met > 0°F
Plausible: if the candidate uses either steam tables – or the Figure 58 "normal condition" curve (i.e. does not note that ACC values are now in effect) then subcooling margin appears to be met.
For 775 psig, Tsat = 517 °F (steam tables) = 505 °F (Fig 58) (non-ACC) = 480 °F (Fig 58 ACC)

D. **Correct**: subcooling is not met at any time - do not meet SI termination criteria at any time step.

Level: SRO Exam

KA: APE 008 AA2.16 (3.8/4.1)

Lesson Plan Objective: EP2 SEQ 29

Source: Mod Ques_093.2

Level of knowledge: analysis

References:
1. E-1 step 6 page 5, 24
2. Revised Databook Figures 57 and 58
3. OMP 1-7 page 9

KA APE 008 Pressurizer Vapor Space Accident - AA2. Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: AA2.16 RCS in-core

thermocouple indicators; use of plant computer for interpretation 3.8 4.1 (CFR: 43.5 / 45.13)

Objective: EP-EP2 16 Explain Enclosure 1 (Foldout Page) actions of EP/1/A/5000/ES-1.1 (SI Termination)

Bank Question: 233.3 ***Answer: D***

1 Pt(s) Unit 1 is conducting a plant startup. Given the following Intermediate Range and Power Range NI channel indications:

- N-35 = 3.1×10^{-5} amps
- N-36 = 3.6×10^{-6} amps
- N-41 = 9.6%
- N-42 = 9.2%
- N-43 = 10.9%
- N-44 = 9.4%
- Thermal Power (OAC) = 10.1%

If the operators have taken all required procedural actions during the startup, which one of the following statements describes:

1. The problem indicated by these readings, and
2. The action required.

A. **1. N-35 is reading too high for existing conditions.**
2. Continue the plant startup by increasing thermal power to greater than 10% power.

B. **1. N-36 is reading too low for existing conditions.**
2. Hold power at current levels until N-36 has been repaired.

C. **1. N-35 is reading too high for existing conditions.**
1. Hold power at current levels until N-35 has been repaired.

D. **1. N-36 is reading too low for existing conditions.**
2. Continue the plant startup by increasing thermal power to greater than 10%.

Distracter Analysis: NI-36 is reading low – at 10% power, the intermediate range NIs should be reading 3×10^{-5} amps

A. **Incorrect**: N36 is ~ one decade too low, power range readings are acceptable.
Plausible: Tech Spec 3.3.1 action statement is correct

B. **Incorrect:** Tech Spec 3.3.1 action is to either raise power above P10 or lower power below P6 to get to a point where N36 is not needed to provide IR high flux trip protection. Cannot hold power < P-10 (10%).
Plausible: Partially correct - N36 is reading too low. The action cited is action statement H that only applies when the reactor is less than P6.

C. **Incorrect**: - N36 reads too low – N35 is reading correctly.
Plausible: Holding power until repairs are made seems an appropriate action for many conditions.

D. **Correct:** N36 is too low – raise power above P10 where it is no longer necessary to have IR high flux trips.

Level: SRO Exam

KA: APE 033 AA2.04 (3.2/3.6)

Lesson Plan Objective: ENB SEQ 3, 14

Source: Mod Ques_233

Level of knowledge: comprehension

References:
1. OP-CN-IC-ENB pages 17-18, 39
2. Tech Spec 3.3.1 pages 3, 4
3. Tech Spec 3.3.1 Table 3.3.1-1 page 1

KA APE 033 Loss of Intermediate Range NI - AA2. Ability to determine and interpret the following as they apply to the Loss of Intermediate Range Nuclear Instrumentation: AA2.04 Satisfactory overlap between source-range, intermediate-range and power-range instrumentation 3.2 3.6 (CFR: 43.5 / 45.13)

Objective IC-ENB 3, 14

3 Describe the overlap provided between each range.

14 State from memory all Tech Spec actions for the applicable system, subsystem and components, which require remedial action to be taken in less than 1 hour.

Bank Question: 571.3 ***Answer: A***

1 Pt(s) Unit 2 is responding to a small break LOCA in ES-1.2, (*Post LOCA Cooldown and Depressurization)*. Step 16 of ES-1.2 requires the operators to depressurize the NC system.

Which one of the following statements correctly describes:

1. The priority for using the prescribed methods of depressurizing the NC system, and
2. The major concern during NC system depressurization?

A. **1. Pressurizer spray – PORV - Auxiliary Spray**
2. Voiding in the upper head

B. **1. Pressurizer spray – PORV - Auxiliary Spray**
2. Thermal shocking the pressurizer spray nozzles.

C. **1. PORV – Auxiliary Spray – Pressurizer Spray**
2. Voiding in the upper head

D. **1. PORV – Auxiliary Spray – Pressurizer Spray**
2. Thermal shocking the pressurizer spray nozzles.

Distracter Analysis: There is a note in ES-1.2 just prior to step 16 that states:

NOTE The upper head region may void during NC System depressurization if NC pumps are not running. This will result in a rapidly increasing Pzr level.

A. **Correct**: Right priority – right bases.

B. **Incorrect:** Thermal shocking the pressurizer nozzles is not the concern in ES-1.2.
Plausible: The priority of depressurization methods is correct. Thermal shock is a common concern in other procedures. IN addition, thermal shock would be a concern whenever pressurizer spray is used – but not the primary concern for this Note.

C. **Incorrect**: Pressurizer spray preferred over PORV and aux spray
Plausible: Partially correct – the primary concern is right.

D. **Plausible**: Pressurizer spray preferred over PORV and aux spray. Thermal shocking the pressurizer nozzles is not the concern in ES-1.2
Plausible: If the candidate thinks that thermal shocking the Pzr nozzles is the concern, then the priority of depressurization methods

makes the most sense – depressurization by using the Pzr spray system is the last priority.

Level: SRO Exam

KA: WE03 G2.1.32 (3.4 /3.8)

Lesson Plan Objective: EP2 Obj: 24

Source: MOD Ques_571.1

Level of knowledge: memory

References:
1. ES-1.2 pages 12-14
2. OP-CN-EP-EP2 pages 10-11
3. ERG Background Document ES-1.2 step 16 pages 19-22

KA W/E03 LOCA Cooldown – Depress 2.1.32 Ability to explain and apply all system limits and precautions. (3.4/3.8) (CFR: 41.10 / 43.2 / 45.12)

Objective: EP-EP2 24 Explain the Bases, including any identified knowledges/abilities, for all of the steps, notes, and cautions in EP/1/A/5000/ES-1.2 (Post LOCA Cooldown and Depressurization)

Bank Question: 618.2 ***Answer: C***

1 Pt(s) Unit 1 is recovering from a loss of offsite power in ES-0.2 (*Natural Circulation Cooldown*). The operators reach step 13, which states:

> ***"IF AT ANY TIME*** *cooldown rate must be raised to greater than 50°F in an hour, THEN* ***GO TO*** *EP/1/A/5000/ES-0.3 (Natural Cooldown with Steam Void in Vessel)"*

Given the following events and conditions:

- T_{hot} = 505°F
- NC Pressure = 750 psig
- RVLIS = 100% upper range, 64% lower range
- All CRDM vent fans are deenergized and cannot be started
- Condensate inventory is extremely limited
- All plant equipment is operating as designed
- Cooldown rate is 50 °F/hr

Which one of the following statements correctly describes the condition of the core and the proper procedure flow path?

REFERENCES PROVIDED: Steam Tables; Data Book Curves 57, 58

A. The core is in a subcooled condition - transition to ES-0.3 to continue the cooldown at > 50°F/hr cooldown rate.

B. The core is in a subcooled condition – remain in ES-0.2 and do not exceed 50°F/hr cooldown rate.

C. The core is in a superheated condition – transition to ES-0.3 to continue the cooldown at >50°F/hr cooldown rate.

D. The core is in a superheated condition – remain in ES-0.2 and do not exceed 50°F/hr cooldown rate.

Distracter Analysis: ES-0.2 does not provide specific guidance for this transitional step. The EOP bases for this step is to make the transition if:

- There is limited condensate storage
- No CRDM fans are operating.

The entry conditions for ES-03 are:

- If cooldown rate must be raised above setpoint (does not say why)

- If reactor vessel indicates not full and it is determined that depressurization must occur

When evaluating transitions, the operators are **required** to use the curves in the Data Book instead of steam tables. These curves include an instrument error offset of ~10°F. If the operators refer to steam tables to evaluate subcooling, the core conditions are subcooled (ignoring instrument error). If they refer to the Figure 58 curve, it will show that the core is in the superheated region as it is more conservative.

Thot = 505°F – subcooled using steam tables – superheated using Figure 58.
Using steam tables:
Tsat for 750 psig = 513 °F > 505°F = subcooled
Tsat for 750 psig = 510 °F > 505 °F = subcooled (if they forget to add 14.7 psi to psig)
Using figure 58:
Tsat for 750 psig = ~497 °F < 505 = superheated (correct answer)
Tsat for 750 +14.7 psig = ~507°F > 505°F = subcooled (if they add 14.7 psi to 750 psig NC pressure)

A. **Incorrect**: Core is in a superheated condition.
Plausible: Partially correct - Must transition to ES-0.3 due to a loss of CRDM vent fans and limited condensate storage. If the candidates use steam tables or add 14.7 psig to NC system pressure when entering Figure 58, they will determine that the core is subcooled.

B. **Incorrect**: Core is in a superheated condition. Do not remain in ES-0.3 with CRDM vent fans not running and limited condensate storage. If the candidates use steam tables or add 14.7 psig to NC system pressure when entering Figure 58, they will determine that the core is subcooled.
Plausible: If the candidate does not correctly determine subcooling and does not understand the reason for the transition.

C. **Correct**: Core is superheated - transition to ES-0.3 is required.

D. **Incorrect**: Transition to ES0.3 is required due to loss of CRDM vent fans and limited condensate storage.
Plausible: Partially correct – the core is superheated. If the candidate is not aware of the EOP bases for this step.

Level: SRO Exam

KA: WE 09EK2.2 (3.6 / 3.9)

Lesson Plan Objective: PS-CCM SEQ 5, EP-EP1-5, 16

Source: MOD Ques_618.1

Level of knowledge: analysis

References:
1. OP-CN-PS-CCM page 17-18
2. Steam Tables - PROVIDED
3. Data Book Curves 57, 58 - PROVIDED
4. ES-0.2 step 13 page 9
5. ES-0.2 background document step 13

KA W/E09 & E10 Natural Circ. G 2.4.6 Knowledge symptom based EOP mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)

Objective: IC-CCM 5 Describe what instrumentation is available and how it should be used should the CCM become inoperable following accident conditions to determine if core cooling exists.

EP-EP1-5 State the Purpose of EP/1/A/5000/ES-0.3 (Natural Circulation Cooldown with Steam Void in Vessel (with RVLIS)).

EP-EP1-16 Explain the Bases, including any identified knowledges/abilities, for all of the steps, notes, and cautions in EP/1/A/5000/ES-0.2 (Natural Circulation Cooldown)

QUESTION DELETED

Bank Question: 705.2 ***Answer: B***

1 Pt(s) Unit 1 was operating at 100% power with no TSAIL entries. Given the following events and conditions:

10/16 at 0200 The DG 1A was declared inoperable.
10/18 at 1100 The DG 1B was declared inoperable.
10/18 at 1200 The DG 1A was declared to be operable.

If two offsite AC circuits remained operable throughout the sequence listed above and DG 1B is not returned to service, which one of the following statements correctly describes when the plant must be in mode 3?

REFERENCES PROVIDED: Tech Spec 3.8.1

A. 10/19 at 0800

B. 10/21 at 1700

C. 10/22 at 0800

D. 10/22 at 1700

Distracter Analysis: Tech Spec 3.8.1 condition B addresses the condition that one D/G is inoperable. This condition allows a single D/G to be inoperable for 72 hours – with an additional allowance that this condition – once entered – must be cleared within 6 days for multiple entries into this Tech Spec – which modifies the normal 24 allowable extension. This question postulates that Tech Spec 3.8.1 is entered and cleared for D/Gs 1A but that D/G 1B remains inoperable. Condition G requires the plant to be shutdown to mode 3 within 6 hours of not completing the required action in condition B.

A. **Incorrect**: Must be in mode 3 before 10/21at 1700
Plausible: This is 72+6 hours from when the Tech Spec 3.8.1 was entered for the 1A D/G.

B. **Correct**: The limiting LCO is the 2nd entry into Tech Spec 3.8.1 caused by the 1B D/G. The extension times are not applicable because the SRO cannot extend the individual LCO.

C. **Incorrect**: Must be in mode 3 before 10/21at 1700
Plausible: This is 6 days from when Tech Spec 3.8.1 was first entered (for the 1A D/G). This extension would be allowable as long as the LCO on the 1B D/G is not shorter (which it is). This

QUESTION DELETED

QUESTION DELETED

extension replaces the standard 24-hour extension period of subsequent train, component or variable inoperability.

D. **Incorrect**: Must be in mode 3 before 10/21at 1700
Plausible: This would be the required action time 72 + 24 + 6 hrs – which allows a 24 hour extension from when the Tech Spec was first entered for the 1A D/G. The 24-hour extension period is allowable under circumstances where the individual LCO continues to be extended based on multiple entries from unrelated components.

Level: SRO Exam

KA: G2.1.12 (2.9/4.0)

Lesson Plan Objective: DG-DG3 10

Source: MOD Ques_705

Level of knowledge: comprehension

References:
1. OP-MC-DG-EPQ pages 21-23
2. Tech Spec 3.8.1
3. Tech Spec 1.3 pages 1-2

KA G 2.1.12 Ability to apply technical specifications for a system. (CFR: 43.2 / 43.5 / 45.3)
IMPORTANCE RO 2.9 SRO 4.0

Objective DG-DG3 40: Given a set of specific plant conditions and access to reference materials, determine the actions necessary to comply with Tech Specs/SLCs.

Question DELETED.

QUESTION DELETED

Bank Question: 1143 Answer: C

1 Pt(s) Unit 1 was operating at 100% power when a steam line rupture occurred. Given the following events and conditions;

- The operators transitioned from E-0 (*Reactor Trip or Safety Injection*) to FR-P1 (*Response to Imminent Thermal Shock Condition*) due to a red path.
- NCPs 1A and 1B were tripped due to high vibration
- The operator reached step 18 of FR-P.1, which requires isolating the cold leg accumulators.
- Given the following parameters:

Time	**0200**	**0205**	**0210**	**0215**
Pzr Pressure (psig)	750	700	650	600
NC Subcooling (°F)	+50	+75	+60	+40
RVLIS D/P indication				
Train A (%)	21	22	22	22
Train B (%)	35	37	47	57

Which one of the following selections correctly describes:
1. The earliest time that the CLAs can be isolated, and
2. The reason why the CLAs should be isolated?

References Provided: FR-P.1 step 18 page 20

A. 0205 – to prevent injecting CLA water into the reactor vessel and increasing the thermal stress on the vessel.

B. 0205 – to prevent injecting the CLA nitrogen bubble into the reactor, creating a gas bubble in the vessel head region.

C. 0210 - to prevent injecting CLA water into the reactor vessel and increasing the thermal stress on the vessel.

D. 0210 - to preserve CLA volume as a source of borated water to prevent re-criticality during cooldown.

Distracter Analysis:

A. **Incorrect**: Cannot isolate the train B accumulators because D/P is < 45% and the 1C NCP is operating.
Plausible: Partially correct – the reason is a valid reason.

QUESTION DELETED

QUESTION DELETED

B. **Incorrect**: Cannot isolate the train B accumulators because D/P is < 45% and the 1C NCP is operating.
Plausible: Partially correct – the reason is a valid reason.

C. **Correct**:

D. **Incorrect**: The reason for isolating the CLAs is not the correct reason.
Plausible: Can take operator action to isolate both CLAs at 0210.

Level: SRO Exam

KA: APE 040 G2.1.32 (3.4/3.8)

Lesson Plan Objective: TA-PTS 16

Source: Mod Ques_372

Level of knowledge: comprehension

References:
1. FR-P.1 pages 19-22
2. FR-P.1 Bases Document page 20
3. OP-CN-TA-PTS page 23

KA APE 040 Steam Line Rupture - Excessive Heat Transfer - G 2.1.32 Ability to explain and apply all system limits and precautions. (CFR: 41.10 / 43.2 / 45.12)

Objective: TA-PTS 16 Describe the reasons for requiring safety injection termination and/or cold leg accumulator isolation.

QUESTION DELETED

Bank Question: 1172 ***Answer: C***

1 Pt(s) Unit 1 has experienced a complete loss of offsite power. Given the following events and conditions:

- Operators are in the process of stabilizing the plant using ES-0.1 (*Reactor Trip Response*)

How is verification of adequate shutdown margin determined in this procedure if DRPI is unavailable?

A. Emergency borate to 145 PPM for each rod not fully inserted and verify all NC Tcolds are greater than 535 °F.

B. Emergency borate to 145 PPM for each rod not fully inserted and verify all NC Tavgs are greater than 535 °F.

C. Emergency borate to 700 ppm above the last known boron concentration and verify all NC Tcolds are greater than 535 °F.

D. Emergency borate to 700 ppm above the last known boron concentration and verify all NC Tavgs are greater than 535 °F.

Distracter Analysis:

A. **Incorrect**: Cannot determine how many rods are not fully inserted – emergency boration is required to 700 ppm above the last known boron concentration to achieve adequate shutdown per RNO step 7a.
Plausible: Partially correct – Tcold is used for the temperature requirement. Boration to 145 ppm for each rod stuck out is the RNO for step 7b.

B. **Incorrect**: Cannot determine how many rods are not fully inserted – emergency boration is required to 700 ppm above the last known boron concentration to achieve adequate shutdown. Tcold is used for the temperature requirement – not Tavg
Plausible: If the student thinks that Tavg should be used (which other steps in this procedure use). Boration to 145 ppm for each rod stuck out is the RNO for step 7b.

C. **Correct**:

D. **Incorrect**: Tcold is used for the temperature requirement – not Tavg
Plausible: If the student thinks that Tavg should be used which other steps in the procedure use.

Level: SRO Exam

KA: EPE 007 G2.4.6 (3.1/4.0)

Lesson Plan Objective: EP-EP1 15

Source: New

Level of knowledge: memory

References:
1. ES-0.1 pages 4-6

KA EPE 007 Reactor Trip - Stabilization – Recovery G 2.4.6 Knowledge symptom based EOP mitigation strategies. 3.1/4.0) (CFR: 41.10 / 43.5 / 45.13)

Objectives EP-EP1 15 Explain the Bases, including any identified knowledges/abilities, for all of the steps, notes, and cautions in EP/1/A/5000/ES-0.1 (Reactor Trip Response).

Bank Question: 1186 ***Answer: D***

1 Pt(s) Unit 1 was operating at 100% power when a turbine trip occurred. Given the following events and conditions:

- The control rods failed to insert.
- Pressurizer pressure = 2340 psig
- The operators entered E-0 (*Reactor Trip or Safety Injection*) and immediately transitioned to FR-S.1 (*Response to Nuclear Power Generation/ATWS*) and carry out all immediate actions.
- 1NV-236B (*Boric Acid to NV Pump Suct*) is opened.
- Boric acid transfer pump switches are in "ON".
- 1NV-312A and 1NV-314B (*Chrg Line Cont Isol*) are open.

Which one of the following statements correctly describes the:
1. NV pump current (running amps) indication,
2. The required actions in accordance with FR-S.1, and
3. The reasons for these actions?

A. **1. NV pump amps are higher than NV pump running amps at normal operating pressure**
2. Manually actuate safety injection
3. To ensure adequate boration flow

B. **1. NV pump amps are higher than NV pump running amps at normal operating pressure**
2. Manually align the NV pump suction to the FWST
3. To provide a source of boric acid

C. **1. NV pump amps are lower than NV pump running amps at normal operating pressure**
2. Depressurize the NC system to 2135 by opening spray valves
3. To prevent challenging the PORVs

D. **1. NV pump amps are lower than NV pump running amps at normal operating pressure**
2. Open the PORVs to depressurize the NC system to 2135 psig
3. To provide adequate boration flow.

Distracter Analysis:

A. **Incorrect**: NV pump running amps will be lower than normal because the NC pressure is higher than normal. Manually actuating

safety injection will also trip the MFPs which is not desired during an ATWS
Plausible: If the candidate recognizes that the normal boric acid flow path is not functioning due to high pressure.

B. **Incorrect**: NV pump running amps will be lower than normal because the NC pressure is higher than normal. If 1NV-312B and 1NV-314A are open, there is no reason to align the FWST.
Plausible: This is the proper RNO action if 1NV-312B and 1NV-314B are not open.

C. **Incorrect**: Do not depressurize using the spray valves – use the PORVs instead. The problem is not challenging the PORVs.
Plausible: Partially correct – NV pump amps are lower than normal due to the discharge characteristics or NV pump against a higher NC pressure. 2335 psig is the actuation setpoint of the PORVs.

D. **Correct**: NV pump amps are lower than normal due to the discharge characteristics or NV pump against a higher NC pressure. FR-S.1 step 4f RNO requires this action to ensure adequate boric acid flow into the core.

Level: SRO Exam

KA: EPE 029 EA2.04 (3.2*/3.2*)

Lesson Plan Objective: EP-FRS 4, 5

Source: New

Level of knowledge: comprehension

References:
1. FR-S.1 step 4 pages 3-4
2. FR-S.1 Background document page 4
3. OP-CN-EP-FRS page 6

KA EPE 029 Anticipated Transient w/o Scram - EA2 Ability to determine or interpret the following as they apply to a ATWS: EA2.04 CVCS centrifugal charging pump operating indication 3.2* 3.3* (CFR 43.5 / 45.13)

Objective: EP-FRS 4, 5

EP-FRS 4 Explain the Bases for all steps in Function Restoration procedures EP/1/A/5000/FR-S Series – Subcriticality

EP-FRS 5 Given a set of specific plant conditions and required procedures, apply the rules of usage and outstanding PPRBs to identify the correct procedure flowpath and necessary actions.

Bank Question: 1187 ***Answer: A***

1 Pt(s)

Unit 1 was operating at 100% power when a large break LOCA occurred inside containment with an unisolable release path into the auxiliary building. Given the following events and conditions:

- The operators completed ECA-1.2 (*LOCA Outside of Containment*) and transitioned to ECA-1.1 (*Loss of Emergency Coolant Recirculation*)
- The release continues into the auxiliary building.
- Containment pressure = 8 psig
- Containment sump level = 3.6 feet
- FWST level = 4.9%
- Core exit thermocouples are reading 850°F and increasing

Which one of the following statements correctly describes:
1. The major action required, and
2. The bases for this action?

A. **1. Depressurize the NC system**
2. To allow CLAs to inject to reduce NC system break flow and loss of inventory.

B. **1. Start 2 NS pumps**
2. To reduce containment pressure.

C. **1. Secure SI flow**
2. To prevent PTS and preserve the remaining FWST inventory.

D. **1. Enter SAMGs and take immediate actions to refill the FWST**
2. To provide a qualified source of water to containment.

Distracter Analysis:

A. **Correct**: When FWST level reaches 5%, suction from the FWST is no longer assured. SI Pumps must be stopped and the NC system depressurized to inject the CLAs and reduce break flow.

B. **Incorrect**: If FWST level is < 5%, NS pumps should be stopped to conserve FWST inventory.
Plausible: If FWST level was > 5%, starting NS pumps would be required by step 6b is containment pressure > 10 psig.

C. **Incorrect**: SI pumps must be stopped when FWST level < 5% to prevent loss of NPSH.
Plausible: This action is required prior to FWST level < 5%.

D. **Incorrect**: Do not enter SAMGs unless T/C temperatures exceed 1200°F.
Plausible: Refilling the FWST is a step in ECA-1.1 – but it is done using OP/1/A/6200/014.

Level: SRO Exam

KA: W/E04 G2.2.25 (2.5/3.7)

Lesson Plan Objective: EP-EP2 13, 14

Source: New

Level of knowledge: comprehension

References:
1. ECA-1.2 page 6
2. OP-CN-EP-EP2 pages 12-13
2. ECA-1.1 pages ECA-1.1 Background Document page 5-6
3. ECA-1.1 pages 2-8, 31-35
4. OP/1/A/6200/014 page 1

KA W/E04 LOCA Outside Containment 2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. (2.5/3.7) (CFR: 43.2)

Objective: EP-EP2 3 and 14:

13 Explain the Bases of the Major Actions of EP/1/A/5000/ECA-1.1 (Loss of Emergency Coolant Recirculation)
14 Explain the Bases of the Major Actions of EP/1/A/5000/ECA-1.2 (LOCA Outside Containment)
27 Explain the Bases, including any identified knowledges/abilities, for all of the steps, notes, and cautions in EP/1/A/5000/ECA-1.1 (Loss of Emergency Coolant Recirculation)

Bank Question: 1188 ***Answer: D***

1 Pt(s) Unit 1 was conducting refueling operations in mode 6. Given the following events and conditions:

- The containment purge system is in operation in the REFUEL mode.
- VQ-10 (*VQ Fans Disch to Unit Vent)* is open as part of a special test.
- Train B of SSPS is in "test".
- The refueling crew dropped a fuel assembly into the refueling cavity.
- The following alarms were received in the control room:
  - 1RAD-1 A/2 (*1EMF-39 Containment Gas Hi RAD*)
  - 1RAD-3 D/2 (*1EMF-17 Reactor Bldg Refuel Bridge*)

Which one of the following statements correctly describes the required actions to respond to this event in AP-25 (*Damaged Spent Fuel*)?

A. **1. Manually actuate containment ventilation isolation**
2. Manually stop the containment purge system.
3. Manually close VQ-10.

B. **1. Verify the containment evacuation alarm has sounded**
2. Manually secure the containment purge.
3. Manually close VQ-10.

C. **1. Verify the containment evacuation alarm has sounded**
2. Verify containment purge has been secured.
3. Manually close VQ-10.

D. **1. Verify the containment evacuation alarm has sounded**
2. Verify containment purge has been secured.
3. Verify VQ-10 has closed.

Distracter Analysis: Placing train B SSPS in test will not defeat the Sh (containment ventilation) signal caused when 1EMF-39 reaches a trip 2 condition.

A. **Incorrect**: There is no need to manually take any of these actions.
Plausible: With a single train of SSPS in test, the candidate may not recall that the containment ventilation signal will close VP and VQ.

B. **Incorrect**: VP and VQ will automatically isolate
Plausible: The containment evacuation alarm will be sounded by 1EMF-17 and 1EMF-39. With a single train of SSPS in test, the

candidate may not recall that the containment ventilation signal will close VP and VQ.

C. **Incorrect**: VQ-10 will automatically close on the Sh signal.
Plausible: If the candidate thinks that 1 train of SSPS will prevent this action.

D. **Correct**:

Level: SRO Exam

KA: APE 036 G2.4.4 (4.0/4.3)

Lesson Plan Objective: FH-FHS 2

Source: New

Level of knowledge: memory

References:
1. OP-CN-FH-FHS pages 16-17, 24
2. OP-CN-CNT-VP pages 18-19
3. OP-CN-CNT-VQ pages 9-10
4. AP-25 pages 2-4

KA APE 036 Fuel Handling Accident G 2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. (CFR 41.10 / 43.2 / 45.6)

Objectives FH-FHS 2 Describe in general terms the actions required per AP/1/A/5500/025 (Damage Spent Fuel), AP/1/A/5500/026 (Loss of Refueling Canal or Spent Fuel Pool Level), and AP/0/A/5500/033 (Damaged Tamper Seal on Special Nuclear Material Shipments).

CNT-VQ
- 3 Describe the signal that will auto stop a VQ fan
- 7 Describe the signals or conditions that will terminate a release or addition
- 8 Describe the effect a SH signal has on VQ

CNT-VP 7 Describe the automatic actions that occur to the VP System in the event of an SH signal, an alarm on EMF-39, or fan trip signal.

Bank Question: 1189 ***Answer: B***

1 Pt(s) Unit 1 was in mode 3 when a switchyard transient caused a loss of offsite power on Unit 1. Given the following events and conditions:

- 1A emergency diesel generator (D/G) was running under full load on the 1ETA bus for a surveillance test.
- The loss of offsite power caused the 1A D/G breaker to trip on under-frequency and the 1A D/G shutdown on overspeed.
- 1B emergency diesel generator (D/G) auto-started normally.
- After the overspeed trip was reset, the 1A D/G failed to start.
- Power is not available from either 1TA or 1TC.
- Power to 2TC is available.

FAIL TO

Which one of the following statements correctly describes:

1. A potential cause of the 1A D/G to auto start the 2nd time, and
2. The Case in AP-07 (*Loss of Normal Power*) that should be entered, and major action taken to restore 1ETA?

A. 1. VG starting air pressure is 145 psig.
2. Complete Case I (*Loss of Normal Power to an Essential Train*) and restore power to 1ETA from Unit 2.

B. 1. VG starting air pressure is 145 psig.
2. Complete Case II (*Loss of All Power to an Essential Train*) and start the 1A EDG manually.

C. 1. Loss of the 1EMXF load center.
2. Complete Case I and restore power to 1ETA from Unit 2.

D. 1. Loss of the 1EMXF load center.
2. Complete Case II and start the 1A EDG manually.

Distracter Analysis:

A. **Incorrect**: Case I of AP-07 is implemented if the 1A D/G does not start and load 1ETA. In case I, power is restored from offsite sources.
Plausible: Less than 150 psig VG pressure will prevent the D/G from starting automatically – but it can be started manually.

B. **Correct**: The 1A D/G can be manually started with VG air pressure at 145 psig.

C. **Incorrect**: Loss of the EMXF will not prevent the 1A D/G from automatically starting. The battery will carry the control power loads. Case I is not the correct procedure.
Plausible: If the candidate does not know that the D/G battery will carry the D/G electrical loads for one hour if EMXF is lost.

D. **Incorrect**: Loss of the EMXF will not prevent the 1A D/G from starting. The battery will carry the control power loads.
Plausible: Partially correct – Case II of AP-07 is the correct procedure.

Level: SRO Exam

KA: SYS 064 A2.14 (2.7/2.9)

Lesson Plan Objective: DG-DG1 10, 14, 19

Source: New

Level of knowledge: memory

References:
1. AP-7 pages 1-3, 11, 22
2. OP-CN-DG-DG1 pages 1212-14, 23, 26
3. OP-CN-EL-EPC pages 7-8

KA SYS 064 Emergency Diesel Generator A2 Ability to (a) predict the impacts of the following malfunctions or operations on the ED/G system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A2.14 Effects (verification) of stopping ED/G under load on isolated bus 2.7 2.9 (CFR: 41.5 / 43.5 / 45.3 / 45.13)

Objective: DG-DG1-10, 14, 19,
10: State the reason Diesel Generator automatic starts are blocked on low VG pressure.
14: Given a one-line diagram, explain how the EPQ system provides DC power to the major DC Loads.
19 Explain the effect of a loss of DC control power on the Diesel Generator while it is shutdown.

Bank Question: 1190.1 Answer: A

1 Pt(s) Units 1 and 2 were operating at 100% power when a hurricane in the eastern portion of the state caused extensive damage to Duke Power electrical distribution system. Given the following events and conditions:

0130 - The plant commenced a controlled shutdown of both units because of grid instability.
0200 - During the shutdown, a loss of offsite power occurred to both units. The transient caused both units reactors to trip. All four D/Gs automatically started and powered the essential busses. Both Units CAPTs auto started.
0220 - Offsite power was restored to both units.
0230 – The OSM first reviews the situation to determine what needs to be reported to the NRC.

Which one of the following statements correctly describes the event category or type and the earliest report that is required to be submitted to the NRC?

References Provided: RP/0/A/5000/01

A. Declare a notification of unusual event and report immediately (but not later than one hour).

B. Declare a site area emergency and report immediately (but not less than 15 minutes).

C. An RPS actuation has occurred; report within four hours under 10CFR50.72.

D. A diesel generator sequencer operation has occurred; report without eight hours under 10CFR50.72.

Distracter Analysis:

A. Correct: Declare a notification of unusual event under EAL 4.5.U-1 because the loss of offsite power to essential buses lasted for > 15 minutes.

B. Incorrect: The declaration of a notification of an unusual event would be required and NRC notification must take place immediately (no later than one hour).
Plausible: The reactor trip requires a 4-hour report to the NRC under §50.72(b)(2)(iv)(B). If the candidate thinks that the NOUE

does not need to be declared because the event has already ended by the time he/she first reviews the EALs.

C. **Incorrect**: The declaration of a notification of an unusual event would be required and NRC notification must take place immediately (no later than one hour).
Plausible: If the candidate thinks that the CA system actuation requires an 8-hour report under §50.72(b)(3)(iv)(A) – this would be correct if the signal was considered "invalid" because the shutdown was in progress and it was part of the operation.

D. **Incorrect**: The declaration of a notification of an unusual event would be required and NRC notification must take place immediately (no later than one hour).
Plausible: If the candidate thinks that an LER report is required under 10CFR50.73 due to the degradation of the offsite power system.

Level: SRO Exam

KA: SYS 062 G2.4.30 (2.2/3.6)

Lesson Plan Objective: none

Source: New

Level of knowledge: comprehension

References:
1. NUREG 1022 page 11
2. RP/0/A/5000/001 Encl 4.5 page 1, Encl 4.9 page 1-2
3. Tech Spec 3.8.1
4. RP/0/B/5000/13 Encl 4.3 page 2
5. RP/0/B/5000/13 Encl 4.4 page 1
6. RP/0/B/5000/13 Encl 4.8 pages 1-2

KA SYS 062 AC Electrical Distribution 2.4.30 Knowledge of which events related to system operations/status should be reported to outside agencies. (2.2/3.6) (CFR: 43.5 / 45.11)

Objective: none

Bank Question: 1191 ***Answer: D***

1 Pt(s) Unit 1 was operating at 100% power when a loss of VI pressure occurred. Given the following events and conditions:

- The VI system became heavily contaminated with oil due to a maintenance problem.
- Both the E and F air dryer packages became plugged and airflow was restricted.
- 1VS-78 was mechanically jammed shut and could not be opened.
- The manual bypass valve (1VI-671) around the air dryers is also mechanically jammed shut.
- Unit 1 VI header pressure dropped to 50 psig and continued to decrease.

Which one of the following statements correctly describes the:
1. Status of the Unit 1 VI system, and
2. The action to be taken in AP-22 (*Loss of Instrument Air*).

A. 1. VI pressure can be restored by manually opening 1VI-500 and cross-connecting VI to VS.
2. Manually open 1VI-500 to restore VI pressure.

B. **1. The VI pressure can be restored by shifting the VI dryers from the "drying" to "regenerating" cycle on the automatic microcomputer control system.**
2. Restore VI header pressure by shifting the VI dryer cycle.

C. 1. The VI air dryers will be automatically bypassed and the system repressurized when 1VI-670 opens.
2. Verify 1VI-670 opens automatically at 45 psig.

D. 1. The VI system cannot be repressurized.
2. Manually trip the reactor before the automatic reactor trip occurs.

Distracter Analysis: Below 50 psig, the CF reg valves and CF reg bypass valves will operate erratically.

A. **Incorrect**: 1VI-500 is the VI to VS supply – not the VS to VI supply. Manually opening this valve will not supply VS to VI because it is upstream of the restriction in the E and F air dryers.

Plausible: Although manually opening this valve could possibly provide an air supply path from VS to VI – if the candidate confuses 1VI-78 and 1VI-500.

B. **Incorrect**: Shifting the VI dryers from drying to regenerating will not improve VI header pressure.
Plausible: If the candidate thinks that shifting the air dryer cycle to regenerating will internally bypass the air drying chambers and restore air pressure.

C. **Incorrect**: 1VI-670 opens automatically to bypass the air dryer at 80 psig. If system pressure is 50 psig, the system has depressurized below the automatic setpoint and this valve is not operating properly.
Plausible: If the candidate is not aware of the operating setpoint for 1VI-670

D. **Correct**: Enclosure 3 to AP-22 requires a manual reactor trip if VI pressure continues to decrease uncontrollably.

Level: SRO Exam

KA: SYS 078 A2.01 (2,4/2.9)

Lesson Plan Objective: SS-VI 11, 28

Source: New

Level of knowledge: comprehension

References:
1. OP-CN-SS-VI pages 15, 20, 36-37
2. AP-22 pages 6, 9-10
3. Drawing CN-1605-1.1

KA SYS 078 Instrument Air A2 Ability to (a) predict the impacts of the following malfunctions or operations on the IAS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A2.01 Air dryer and filter malfunctions 2.4 2.9 (CFR: 41.5 / 43.5 / 45.3 / 45.13)

Objectives SS-VI 11, 28:

11 Describe the automatic actions, alarms, and their setpoints associated with the Instrument Air Dryers

28 Discuss the actions of the Loss of VI AP/0/A/5500/022

Bank Question: 1192 ***Answer: D***

1 Pt(s) Unit 1 was operating at 70% power with Xenon concentration at equilibrium. Given the following events and conditions:

- Control bank D is at 218 steps.
- Control rod H-8 drops into the core to 100 steps.
- Attempts to recover the rod are not successful.
- The rod is left at that position while reactor engineering evaluates the situation.

Which one of the following statements correctly describes the:
1. Change in AFD 24 hours after the rod dropped, and
2. The recommended action to stop the Xenon oscillation?

A. **1. AFD will swing in the negative direction.**
2. Borate the core to dampen Xenon oscillations.

B. **1. AFD will swing in the negative direction.**
2. Insert and withdraw bank D to perform a "bang bang".

C. **1. AFD will swing in the positive direction.**
2. Borate the core to dampen Xenon oscillations.

D. **1. AFD will swing in the positive direction.**
2. Insert and withdraw bank D to perform a "bang bang".

Distracter Analysis: Operation is allowed with one rod stuck outside of bank Tech Spec limits provided the power level is < 75%.

A. **Incorrect**: AFD oscillations become positive at the 24-hour point after the rod drop. Borating will not solve the problem.
Plausible: If the candidate confuses the 24-hour Xe oscillation with the 48 hour XE oscillation response.

B. **Incorrect**: AFD oscillations become positive at the 24 hour point after the rod drop.
Plausible: Partially correct – the "bang bang" control rod sequencing will suppress the oscillation. If the candidate confuses the 24 hour Xe oscillation with the 48 hour XE oscillation response.

C. **Incorrect**: Borating will not suppress Xe oscillations.
Plausible: Partially correct – AFD will swing in the positive direction at the 24-hour point.

D. **Correct**:

Level: SRO Exam

KA: SYS 015 A2.03 (3.2/3.5*)

Lesson Plan Objective: CTH-PD 7

Source: New

Level of knowledge: comprehension

References:
1. OP-CN-CTH-PD pages 11-14
2. OP/1/A6100/003 Encl 4.3 page 4

KA SYS 015 Nuclear Instrumentation A2 Ability to (a) predict the impacts of the following malfunctions or operations on the NIS; and (b based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A2.03 Xenon oscillations. 3.2 3.5* (CFR: 41.5 / 43.5 / 45.3 / 45.5)

Objective CTH-PD 7: Discuss the actions the operator must take to maintain AFD on target for the following conditions.

- Power changes
- Xenon oscillations

Bank Question: 1193 ***Answer: D***

1 Pt(s) Unit 1 was operating at 100% power when a feedwater control transient occurred. Given the following events and conditions:

- A feedwater header pressure transmitter was being returned to service.
- A hydraulic transient occurred in the common sensing line serving the three feedwater header transmitters, as the transmitter was being valved-in.
- Feedwater pump speed increased by 25 rpm.
- All main feedwater control valves opened from 50% to 70%.
- All main feed and bypass control valve controllers shifted to *MANUAL* mode.
- Steam flow/feed flow mismatch shows feedwater flow is too high.

Which one of the following statements correctly describes:

1. The status of the master and individual main feedwater pump speed controllers, and
2. The major actions in AP-06 (*Loss of S/G Feedwater*) Case III (*DFCS Not in Auto*) required to respond to this problem?

A. 1. The master CF pump speed controller remains in automatic, the individual CF pump speed controllers shift to manual.
2. Increase feedwater flow using the master CF pump speed controller.

B. 1. The master CF pump speed controller remains in automatic, the individual CF pump speed controllers shift to manual.
2. Reduce feedwater flow using the master CF pump speed controller.

C. 1. The master and individual CF pump controllers shift to manual.
2. Increase feedwater flow using the master CF pump speed controller.

D. 1. The master and individual CF pump controllers shift to manual.
2. Reduce feedwater flow using the individual CF pump speed controllers for each CF pump.

Distracter Analysis:

A. **Incorrect**: The master feedwater pump speed controller shifts to manual – does not stay in automatic. Feedwater flow should be reduced not increased.
Plausible: If the applicant thinks that this problem constitutes a loss of feedwater.

B. **Incorrect**: The master feedwater pump speed controller shifts to manual – does not stay in automatic.
Plausible: Partially correct – feedwater flow should be increased. However, the master feedwater pump speed controller will not control MFP speed because the individual MFP speed controllers have shifted to manual mode.

C. **Incorrect**: The master feedwater pump speed controller is ineffective because the individual MFP speed controllers have shifted to manual mode. Feedwater flow must be reduced not increased.
Plausible: This action caused a reactor trip in 2003 as documented in PIP C-03-00541.

D. **Correct**:

Level: SRO Exam

KA: SYS 035 A2.04 (3.6/3.8)

Lesson Plan Objective: CF-IFE 15

Source: New

Level of knowledge: comprehension

References:
1. OP-CN-CF-IFE pages 24-25
2. AP-06 pages 1-2, 15-17

KA SYS 035 Steam Generator A2 Ability to (a) predict the impacts of the following malfunctions or operations on the GS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A2.04 Steam flow/feed mismatch 3.6 3.8 (CFR: 41.5 / 43.5 / 45.3 / 45.5)

Objective CF-IFE 15 Explain the function and interrelationship of CFPT Master and Slave control stations including:
- Shifting between manual and automatic operation.
- The function of Bias when both CFPTs are in automatic.

Bank Question: 1194 ***Answer: C***

1 Pt(s) Which one of the following changes will require a 10CFR50.59 review?

A. **Change to the Physical Security Plan that reduces the shift staffing requirements for security guards.**

B. **Revision to the Emergency Plan changes the designated assembly areas for accountability.**

C. **System modification that adds a backup Nitrogen accumulator to an air operated containment isolation valve.**

D. **Changes to the Nuclear Quality Assurance Plan**

Distracter Analysis:

A. **Incorrect**: Does not require a 10CFR50.59 evaluation. Security Guard staffing is not covered under Tech Specs but under 10CFR50.72.
Plausible: If the candidate is not familiar with the requirements for USQs. Some station staffing requirements are covered under Tech Specs.

B. **Incorrect**: Does not require a 10CFR50.59 evaluation. The emergency plan is changed under the 10CFR50.54q process which is similar in concept to 10CFR50.59 but not the same.
Plausible: If the candidate is not familiar with the requirements for USQs.

C. **Correct**: Containment isolation valves are Tech Spec SSCs.

D. **Incorrect**: Does not require a 10CFR50.59 evaluation. The QA Plan is not a Tech Spec SSC.
Plausible: If the candidate is not familiar with the requirements for USQs. NQA is covered under 10CFR50 Appendix B.

Level: SRO Exam

KA: APE 065

Lesson Plan Objective: none

Source: Bank #AD2-001-H

Level of knowledge: memory

References:
1. NSD 203 page 9

KA APE 065 Loss of Instrument Air 2.2.8 Knowledge of the process for determining if the proposed change, test, or experiment involves an unreviewed safety question. (CFR: 43.3 / 45.13) IMPORTANCE RO 1.8 SRO 3.3

Objective: none

Bank Question: 1195 ***Answer: B***

1 Pt(s) Unit 1 was operating at 100% power when there were indications of high activity in the NC system. Given the following events and conditions:

- Demineralizer 1A contains mixed bed resin and has been in service for 200 days since the last outage.
- Demineralizer 1B contains freshly charged cation resin and has been pre-treated but has never been placed in service.
- The fuel that was loaded after the last outage has been identified to have cladding flaws in a 10CFR21 report by the manufacturer.

Date 10/16/04						
Sample Time	**0200**	**0600**	**1000**	**1400**	**1800**	**2200**
NC Activity:						
Dose Equiv. I (μCi/g)	0.8	50	45	50	45	45

0600 The operators enter AP-18 (*High Activity in Reactor Coolant*).
- Letdown flow has been increased to maximum.

0630 Chemistry reports the high activity is due to failed fuel.
0700 Reactor power has been reduced to 70%.

Which one of the following statements correctly describes the required actions?

References Provided: Tech Spec 3.4.16 and AP-18

A. Remove demineralizer 1A from service and shutdown to mode 3 (<500°F) no later than 1200 on 10/18/04.

B. Place demineralizer 1B in service and shutdown to mode 3 (<500°F) no later than 1200 on 10/18/04.

C. Remove demineralizer 1A from service and shutdown to mode 3 (<500°F) no later than 1200 on 10/16/04.

D. Place demineralizer 1B in service and shutdown to mode 3 (<500°F) no later than 1200 on 10/16/04.

Distracter Analysis: With gross activity levels not decreasing, the indications are that the 1A demineralizer has been exhausted. AP-18 only requires that "at least" 1 demineralizer be in service to clean up the high activity. With activity levels not being reduced with

demineralizer 1A in service, it should be clear that this demineralizer is exhausted and is not assisting in the cleanup effort. In addition, demineralizer 1B contains cation resin, which is specifically designed to clean up cesium after a fuel failure.

A. **Incorrect**: Removing demineralizer 1A from service is not required by AP-18. If demineralizer 1A were removed form service without placing another demineralizer in service, there would be no method of cleaning up the high activity.
Plausible: Partially correct - Clean up of the high activity is allowed for 48 hours in accordance with Tech Spec 3.4.16 condition A because the activity is within the allowable region of Figure 3.4.16-1. If clean up below 1 μCi/g is not completed within 48 hours, shutdown to mode 3 <500°F is required 6 hours later in accordance with action statement C.

B. **Correct**: Clean up of the high activity is allowed for 48 hours in accordance with Tech Spec 3.4.16 condition A because the activity is within the allowable region of Figure 3.4.16-1. If clean up below 1 μCi/g is not completed within 48 hours, shutdown to mode 3 <500°F is required 6 hours later in accordance with action statement C.

C. **Incorrect**: Removing demineralizer 1A from service is not required. Placing a fresh demineralizer in service is necessary to clean up the high activity. Clean up of the high activity is allowed for 48 hours in accordance with Tech Spec 3.4.16 condition A because the activity is within the allowable region of Figure 3.4.16-1. If clean up below 1 μCi/g is not completed within 48 hours, shutdown to mode 3 <500°F is required 6 hours later in accordance with action statement C.
Plausible: The applicant may think that removing demineralizer 1A from service is the appropriate action because it is not cleaning up the activity. The applicant may also not understand how to read and interpret Figure 3.4.16-1 and may apply the 6 hour shutdown action statement.

D. **Incorrect**: Clean up of the high activity is allowed for 48 hours in accordance with Tech Spec 3.4.16 condition A because the activity is within the allowable region of Figure 3.4.16-1. If clean up below 1 μCi/g is not completed within 48 hours, shutdown to mode 3 <500°F is required 6 hours later in accordance with action statement C.
Plausible: This would be the correct action if activity was in the unacceptable region of Figure 3.4.16-1.

Level: SRO Exam

KA: APE 076 AA2.07 (2.4/2.7*)

Lesson Plan Objective: BNT-CH07 Seq 4

Source: New

Level of knowledge: comprehension

References:
1. Tech Spec 3.4.16
2. AP-18
3. BNT-CH07 pages 8-9

KA APE 076 High Reactor Coolant Activity AA1. Ability to operate and / or monitor the following as they apply to the High Reactor Coolant Activity: AA2.07 When demineralizer resin needs to be replaced 2.4 2.7* |(CFR 41.7 / 45.5 / 45.6)

Objective: BNT-CH07 Seq 4: Identify the primary system chemistry limits that are Technical Specifications.

Bank Question: 1197 ***Answer: C***

1 Pt(s) Unit 1 was operating at 100% power. The ORAM-SENTINAL risk model indicates that a planned work activity places the plant in an ORANGE condition.

Which one of the following statements correctly describes the required steps to be taken to ensure risk is managed in accordance with NSD-415 (*Operational Risk Management (Modes 1-3) Per 10CFR50.65(a.4))?*

A. Work will not be scheduled until the PRA model has been modified to properly model this activity.

B. Operations and Maintenance personnel shall discuss the planned work activity to increase Operator and Maintenance awareness of the risk of the work activity.

C. There must be a written Risk Management Plan overseen by the Work Control organization.

D. This work activity is not normally allowed and will not be scheduled without Plant Operational Review Committee (PORC) approval.

Distracter Analysis:

A. **Incorrect**: This is required for WHITE conditions.
Plausible: If the applicant is not familiar with NSD-415.

B. **Incorrect**: This is required for YELLOW conditions.
Plausible: If the applicant is not familiar with NSD-415.

C. **Correct**:

D. **Incorrect**: PORC approval is required only for RED conditions.
Plausible: If the applicant is not familiar with NSD-415.

Level: SRO Exam

KA: G2.2.20 (2.2/3.3)

Lesson Plan Objective: none

Source: New

Level of knowledge: memory

References:
1. NSD-415 pages 2, 13-14

KA G 2.2.20 Knowledge of the process for managing troubleshooting activities. (CFR: 43.5 / 45.13) IMPORTANCE RO 2.2 SRO 3.3

Objective: none

Bank Question: 1198 ***Answer: B***

1 Pt(s) Unit 1 was shutdown to mode 6 prior to a refueling outage. Given the following events and conditions:

- A worker was plugging S/G tubes for 2 hours while wearing a respirator with an efficiency factor of 99.9% and full PCs inside a plastic outer suit.
- His prior annual exposure history was:
  - 1050 mrem TEDE
  - 10 mrem CDE
  - 20 mrem CEDE.
- General area radiation in the work area was 1000 mrem/hr.
- The airborne contamination level was 250 DAC.
- He had a hot particle lodged on the bottom of his rubber bootie, outside of the sole of his shoe with a contact dose rate of 100 Rem/hr (gamma) and 250 Rem/hr (beta).
- The hot particle was detected and removed upon exit from the work area.
- He had been granted all applicable dose extensions allowable but this was not a planned special exposure for this work.

Which one of the selections correctly describes:

1. The 10CFR20 limit that was exceeded, and
2. What procedure should be used to first report the problem?

A. 1. TEDE limit
2. RP/0/B/5000/013 (*NRC Notification Requirements*)

B. 1. CEDE limit
2. RP/0/B/5000/013 (*NRC Notification Requirements*)

C. 1. TEDE limit
2. RP/0/B/5000/06A (*Notifications to States and Counties from the Control Room*)

D. 1. CEDE limit
2. RP/0/B/5000/06A (*Notifications to States and Counties from the Control Room*)

Distracter Analysis:

TEDE = 2 hr x 500 mrem/hr = 1000 mrem. < 5 Rem TEDE limit. Adding his prior exposure +1050 mrem = 2050 mrem for the year. This exceeds the Duke Power Site Admin limit 0f 2000 mrem.

CEDE = 2 hr x 100 rem/hr = 200 Rem < 250 Rad for dose to extremities
Dose from hot particle beta radiation will not penetrate through shoe.
Total CEDE dose = 200 Rem + 20 mrem = 200.02 Rem CEDE.
Internal dose with respirator:
CDE = 250 DAC x 2 hr x 2.5 mrem/DAC-hr = 1250 mrem (CDE or internal dose)
Respirator efficiency = 99.9% = 0.001 x 1250 mrem = 1.2 mrem (insignificant)

A. **Incorrect**: His TEDE did not exceed the limit of 5 rem/yr.
Plausible: If the applicant miscalculates the dose or does not know the 10CFR20 limit. If he considers the dose from the hot particle to be additive to the whole body dose, he could determine that the 5 Rem limit was exceeded. Also he exceeds the 2000 Rem site administrative limit – If he exceeded the TEDE limit, he would report to the NRC under RP/0/B/5000/13.

B. **Correct**: The 50 Rem 10CFR20 CEDE dose limit was exceeded; the 24-hour report is required to the NRC.

C. **Incorrect**: The TEDE dose limit is not exceeded and the state and local authorities are not notified if it had been.
Plausible: If the candidate thinks that the hot particle contributes to TEDE dose, he would think that TEDE was exceeded. State and Local authorities are notified for transportation of contaminated personnel offsite.

D. **Incorrect**: State and Local authorities are not notified for exceeding CEDE limits.
Plausible: Partially correct – the 50 Rem/yr CEDE limit is exceeded. State and Local authorities are notified for transportation of contaminated personnel offsite.

Level: SRO Exam

KA: G2.3.1 (2.6/3.0)

Lesson Plan Objective: none

Source: New

Level of knowledge: comprehension

References:
1. RP/0/B/5000/013 Encl 4.1 page 1
2. RP/0/B/5000/013 Encl 4.5 page 1

KA G 2.3.1 Knowledge of 10 CFR: 20 and related facility radiation control requirements. (CFR: 41.12 / 43.4. 45.9 / 45.10) IMPORTANCE RO 2.6 SRO 3.0

Objective: none

Bank Question: 1205 ***Answer: D***

1 Pt(s) Unit 1 was in a refueling outage. Given the following events and conditions:

- An operator was working the first shift after a 7-day break.
- He had completed a 12-hour shift at 0600 and had returned home to rest at 0700.
- A problem occurred at the plant and the operator was called out 1100 and directed to return to work to assist the job for 1 hour on site.
- The operator meets fitness for duty requirements and complies with the applicable management procedures for call outs when he arrives on site.

Is the operator required to fill out a Request for Work Hours Extension or a PIP before starting work?

A. The operator is required to fill out a Request for Work Hours Extension form and initiate a PIP for violating NSD-200 limits prior to starting work.

B. The operator is only required to fill out a Request for Work Hours Extension form prior to starting work. Initiating the PIP is not required because NSD-200 limits were not violated.

C. The operator is required to initiate a PIP prior to returning to starting work. The Request for Work Hours Extension form is not required because NSD-200 limits were not violated.

D. The operator does not need to fill out a Request for Work Hours Extension form. Initiating a PIP for violating NSD-200 limits is not required.

Distracter Analysis: The operator is required to have an 8-hour break between scheduled work periods. This rule does not apply if the operator is "called out". All other overtime limits still apply and – if they were exceeded – would require an overtime extension form and a PIP.

A. **Incorrect**: Because the operator was called out, the requirement to fill out an overtime extension and PIP is not required.
Plausible: This is the normal procedure if an operator is not called out.

B. **Incorrect**: Because the operator was called out, the requirement to fill out an overtime extension and PIP is not mandatory.

Plausible: If the candidate is not aware of the exception for call outs.

C. **Incorrect**: Not required to complete a PIP.
Plausible: If the candidate is not aware of the exception for call outs.

D. **Correct**: The operator is only required to meet FFD and Management Procedures for call-outs. Only the 8 hour break requirement allows waiver of this rule.

Level: SRO Exam

KA: G2.1.5 (2.3/3.4)

Lesson Plan Objective: ADM-NS05-8

Source: New

Level of knowledge: memory

References:
1. NSD-200 Appendix A page 5

KA G 2.1.5 Ability to locate and use procedures and directives related to shift staffing and activities. (CFR: 41.10 / 43.5 / 45.12) IMPORTANCE RO 2.3 SRO 3.4

Objective ADM-NS05 8: Explain the overtime restrictions/requirements for personnel who perform safety related functions. (T.S.5.2.2, NSD 200)

Bank Question: 1206.1 Answer: A

1 Pt(s) Units 1 was in a refueling outage and Unit 2 was operating at 100% power when a severe thunderstorm occurred. Given the following events and conditions:

- At 0200 lightning struck the Unit 1 Turbine Building causing a severe electrical transient and starting a fire in a pile of combustible staging material in the southeast corner of the Unit 1 Turbine Building.
- Unit 2 experienced a feedwater transient that caused a hi-hi S/G level and a turbine trip.
  - The reactor failed to trip automatically and the operators manually tripped the reactor immediately.
  - The crew completed E-0 (*Reactor Trip or Safety Injection*) and transitioned to ES-01 (*Reactor Trip Recovery*)
- At 0215, after successfully stabilizing the plant, the OSM reviewed the EALs in RP/0/A/5000/001 (*Classification of Emergency*) and notes the Fire Brigade is still fighting the fire in the Unit 1 Turbine Building.

Which one of the following statements correctly describes the actions of the OSM in response to these events?

References Provided: RP/0/A/5000/001 (Classification of Emergency)

A. Declare an Alert. Implement RP/0/A/5000/003 (*Alert*).

B. Declare a Notification of Unusual Event. Implement RP/0/A/5000/002 (*Notification of Unusual Event*).

C. Declare a Notification of Unusual Event on Unit 1 and an Alert on Unit 2. Implement RP/0/A/5000/003 (*Alert*).

D. Declare a Notification of Unusual Event and report that the station met the criteria for an Alert at 0200 but the Alert has been terminated. Implement RP/0/A/5000/002 (*Notification of Unusual Event*).

Distracter Analysis:

A. Correct: Declaration of an Alert for this condition is specifically required under EAL 4.4.A.4 and Enclosure 4.9 of RP/0/A/5000/001 for this condition.

B. **Incorrect**: The criterion for an Alert has been met and the Alert must be declared IAW EAL 4.4.A.4 and Enclosure 4.9 of RP/0/A/5000/001 for this condition.
Plausible: If the candidate thinks that because the ATWS is over, it is not necessary to declare an Alert. The fire inside the protected area lasting > 15 minutes meets the criteria for a NOUE under EAL 4.6.U.1.

C. **Incorrect**: The declaration of an emergency classification is a site-wide declaration. It is not proper to declare different classifications on different units.
Plausible: Unit 1 meets the requirement for a NOUE and Unit 2 meets the requirement for an Alert.

D. **Incorrect**: The OSM is required to declare the Alert condition.
Plausible: If the Alert condition is "not recognized at the time of occurrence but is identified well after the condition has occurred", it would not be appropriate to declare the Alert and this would be the correct answer.

Level: SRO Exam

KA: G2.4.40 (2.3/4.0)

Lesson Plan Objective: SEP-02, 17

Source: New

Level of knowledge: comprehension

References:
1. RP/0/A/5000/001 Encl 4.4, page 1, Encl 4.6 page 1, Encl 4.9 pages 1-2

KA G 2.4.40 Knowledge of the SRO's responsibilities in emergency plan implementation. (CFR: 45.11) IMPORTANCE RO 2.3 SRO 4.0

Objective SEP-02 When given a set of plant conditions and access to reference materials, correctly classify an event using RP/0/A/5000/001.

SEP-17 Prepare and evaluate Emergency Notification Forms for both initial and follow-up notification for any given accident scenario.

Bank Question: 1207 ***Answer: C***

1 Pt(s) A fire had occurred in the plant which damaged sufficient equipment to require operation from the SSF per OP/0/B/6100/013 (*SSF Operations*).

What is the capability of the SSF regarding plant stabilization and cooldown?

A. Maintain Hot Standby conditions for 3 days and then shutdown to Cold Shutdown <u>without</u> additional damage control measures.

B. Maintain Hot Shutdown conditions for 3 days and then shutdown to Cold Shutdown <u>without</u> additional damage control measures.

C. Maintain Hot Standby conditions for 3 days and then shutdown to Cold Shutdown <u>using</u> additional damage control measures.

D. Maintain Hot Shutdown conditions for 3 days and then shutdown to Cold Shutdown <u>using</u> additional damage control measures.

Distracter Analysis:

A. **Incorrect**: The design basis requires using additional damage control measures to achieve cold shutdown.
Plausible: Partially correct – the SSF is designed to achieve hot standby conditions.

B. **Incorrect**: The SSF is not designed to shut the plant down to mode 4 hot shutdown.
Plausible: Many systems are designed to achieve mode 4 or 5. This would be a conservative answer.

C. **Correct**: This is the design bases of the SSF.

D. **Incorrect**: The SSF is not designed to shut the plant down to mode 4 hot shutdown.
Plausible: Many systems are designed to achieve mode 4 or 5.

Level: SRO Exam

KA: G2.4.27 ()

Lesson Plan Objective: none

Source: New

Level of knowledge: memory

References:
1. OP-CN-CP-AD page 6

KA G2.4.27 Knowledge of fire in the plant procedure. (CFR: 41.10 / 43.5 / 45.13)
IMPORTANCE RO 3.0 SRO 3.5

Objective: none

Bank Question: 1208 ***Answer: C***

1 Pt(s) Unit 1 is shutdown in Mode 6. Given the following events and conditions:

- Containment airlock doors are all open.
- A full shift of qualified maintenance personnel are inside containment.
- The Refueling SRO is in the Control Room.
- The Fuel Handling Maintenance Supervisor is inside containment.
- Refueling has been completed and the Maintenance Supervisor requests permission to begin control rod latching.

What additional requirements (if any) must be met to proceed with latching control rods under the direction of the Fuel Handling Maintenance Supervisor?

A. The Refueling SRO must be in containment.

B. The Fuel Handling Maintenance Supervisor must establish communications with the Refueling SRO in the Control Room.

C. The Refueling SRO must be in containment and containment integrity must be restored.

D. The Fuel Handling Maintenance Supervisor must establish communications with the Refueling SRO in the Control Room and containment integrity must be restored.

Distracter Analysis: Latching rods is considered to be a "core alteration" under Tech Specs.

A. **Incorrect**: Core alterations require containment integrity to be established.
Plausible: If the candidate does not realize that latching control rods is a core alteration. Partially correct – the SRO must be present in containment.

B. **Incorrect**: The SRO must be physically present in containment and containment integrity must be established when core alterations are in progress.
Plausible: If the candidate does not realize that latching control rods is a core alteration.

C. **Correct**:

D. **Incorrect**: The SRO must be physically present in containment when core alterations are in progress.

Plausible: If the candidate does not realize that latching control rods is a core alteration – or does not know the requirements.

Level: SRO Exam

KA: G2.2.27 (2.6/3.5)

Lesson Plan Objective: FH-FHS-6

Source: Bank

Level of knowledge: memory

References:
1. SLC 16.9-18
2. PT/0/A/4150/022 page 8
2. PT/1/A/4550/001C page 1
3. MP/0/A/7150/067 page 23

KA G2.2.27 Knowledge of the refueling process. (CFR: 43.6 / 45.13) IMPORTANCE RO 2.6 SRO 3.5

Objective FH-FHS-6: Given a set of specific plant conditions and access to reference materials, determine the actions necessary to comply with Tech Specs/SLCs.

Bank Question: 1209.1 Answer: A

1 Pt(s)

Unit 1 was operating at 100% when the 1A S/G feedwater line breaks in containment. Given the following conditions and events:

- 5 minutes after the initiating event, the following conditions exist:
  - 1A S/G pressure – 0 psig and stable
  - 1A S/G WR level – 0% and stable
  - NC pressure – 2000 psig and increasing
  - Pressurizer level – 40% and increasing
  - Containment pressure – 5.4 psig and decreasing
  - No EMF trip 1 alarms are lit.
- The crew has previously taken all actions to isolate 1A S/G using EP/1/A/5000/E-2 (*Faulted Steam Generator Isolation*) and transitioned to EP/1/A/5000/ES-1.1 (*Safety Injection Termination*). Termination is in progress when the following conditions are noted by the crew:
  - 1A S/G pressure – 40 psig and increasing
  - 1A S/G WR level – 5% and increasing
  - NC pressure 1700 psig and decreasing
  - Pressurizer level – 20% and decreasing
  - Containment pressure – 1.6 psig and increasing
  - No EMF trip 1 alarms are lit.

Which one of the following selections correctly describes:

1. The cause of the symptoms observed, and
2. The correct procedure flowpath to be implemented?

A. **1. A tube rupture has occurred on 1A S/G.**
2. E-3 (*Steam Generator Tube Rupture*) and ECA-3.1 *(SGTR with Loss of Reactor Coolant – Subcooled Recovery Desired)*

B. **1. A tube rupture has occurred on 1A S/G.**
2. E-3 (*Steam Generator Tube Rupture*) and ES-3.1 (*Post SGTR using Backfill)*

C. **1. A LOCA outside containment has occurred.**
2. E-1 *(Loss of Reactor or Secondary Coolant)* and ECA-1.2 (*LOCA Outside Containment*)

D. **1. A LOCA has occurred inside containment.**
2 E-1 (*Loss of Reactor or Secondary Coolant*) and ES-1.2 *(Post LOCA Cooldown and Depressurization)*

Distracter Analysis:

A. **Correct**: The increase in S/G 1A pressure and level is the key to diagnosis. Secondary EMFs do not alarm because the rupture happens after the neutron flux has decayed away and the N16 gamma flux is below detectable levels. The correct procedural flowpath is from ES-1.1 to E-3 based on the SGTR Transition Criteria in the foldout page – then to ECA-3.1 because the S/G is both faulted and ruptured. In addition, E-1 has the same SGTR transition criterion as ES-1.1 so if they go to E-1, they must transition to E-3.

B. **Incorrect**: The correct procedural flowpath is from ES-1.1 to E-3 to ECA-3.1 because the S/G is both faulted and ruptured.
Plausible: This is the normal procedural flowpath for a ruptured S/G.

C. **Incorrect**: S/G 1A pressure has increased from 0 to 40 psig. Would likely get EMF alarms in the Aux Building if there were a release path from containment into the auxiliary building.
Plausible: A loss of NC system inventory is occurring, there are no EMF alarms, and containment pressure has not increased – all point to a LOCA outside of containment. No EMF alarms on secondary systems. E-1 to ECA-1.2 is the correct flowpath for a LOCA outside containment.

D. **Incorrect**: ES-1.1 encl 1 has a SGTR transition criteria that requires going to E-3 if S/G level is "increasing in an uncontrolled manner. This transition criteria requires the operator to transition to E-3 and not go to E-1.
Plausible: A loss of NC system inventory is occurring and there are no EMF alarms. Many symptoms point to a LOCA. E-1 to ES-1.2 is the correct procedure flowpath for a LOCA inside containment. The candidate will select this choice unless they recognize that they meet the ES-1.1 SGTR transition criteria in the foldout page.

Level: SRO Exam

KA: EPE 038 G2.4.4 (4.0/4.3)

Lesson Plan Objective: EP-EP4 19

Source: New

Level of knowledge: comprehension

References:
1. OP-CN-EP-EP4 pages 6-7, 12-13
2. E-3 page 1

3. ES-1.1 page 2 and Encl 1 page 1
4. E-1 page 2 and Encl 1 page 1

KA EPE 038 G2.4.4 Steam Generator Tube Rupture G2.4.4 Ability to recognize abnormal indications for system operating parameters, which are entry-level conditions for emergency and abnormal operating procedures. (CFR 41.10 / 43.2 / 45.6)

Objective: EP-EP4 19: Given a set of specific plant conditions and all required procedures, use the rules of usage and outstanding PPRBs to identify the correct procedure flowpath