QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

(1) QUESTION NUMBER: 001

The reactor was at 100% power when an event occurred; EOP-00 Standard Post Trip Actions are in progress. The following conditions exist:

- Reactor Power is 10^{-1}% lowering
- Startup Rate -0.5 DPM
- Pressurizer Level 28% lowering
- Pressurizer Pressure 1870 psig lowering
- Steam Generator Levels 20% NR lowering
- Steam Generator Pressures 825 psia lowering
- RCS Tcold 527°F lowering
- Trippable CEAs All fully inserted
- Turbine Stop and Intercept Valves Open

The BOPO has attempted to trip the Turbine from CB-10/11 with the pushbuttons with no effect. Given the conditions above:

1) What is the next contingency action to be taken by the BOPO, and
2) What is the basis for this action?

	Next Action to take	What is the basis
A.	Close both MSIVs and their Bypass Valves.	Prevent lowering RCS temperature below its no load value.
B.	Close both MSIVs and their Bypass Valves.	This action will conserve Steam Generator inventory.
C.	Place **BOTH** EHC Pumps in "PULL-TO-LOCK":	Prevent lowering RCS temperature below its no load value.
D.	Place **BOTH** EHC Pumps in "PULL-TO-LOCK":	This action will conserve Steam Generator inventory.

QUESTIONS REPORT

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EPE: 007 Reactor Trip EA2 Ability to determine or interpret the following as they apply to a reactor trip:EA2.02 Proper actions to be taken if the automatic safety functions have not taken place

RO 4.3 10 CFR 55.41(b) (7)

LP 7-18-10 EO 1.11 Given a set of plant conditions and a copy of EOP-00, determine the appropriate response to the plant conditions.

Justification for Distractors

A. Plausible, because there is a contingency step in EOP-00 to close the MSIVs if the cooldown is uncontrolled and if the S/G pressure is below 700 psia. This is incorrect, because this is not the next method directed in the procedure. This is because, although the UHE would be stopped, control of the process is not controlled with the SD&B system and; therefore, temperature would go below its no load value.

B. Plausible, for the same reason as above; but incorrect because pressure is not below 700 psia, and it would not conserve S/G inventory any more than the other method, because the decay heat is the same.

C. **Correct Answer, this is the next action identified in EOP-00, and it will allow a more controlled cooldown than using the air assisted steam generator safeties.**

D. Plausible, because this is the action directed next in the procedure, but incorrect because it would not conserve S/G inventory any more than the other method, because the decay heat is the same.

References

TBD-EOP-00 Standard Post Trip Actions

Cog Level - High because it is asking the students to make a decision of which step to take based on an abnormal set of conditions and provide a basis for the decision.

New

Validators LOD 2.5

Rev 1

KA#:	000007 EA2.02	Bank Ref #:	1
LP# / Objective:	7-18-10 01.11	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	EOP-00	Handout:	

(2)QUESTION NUMBER: 002

The reactor tripped from 100% power. EOP-00, Standard Post Trip Actions, are in progress. The following conditions exist:

- A Pressurizer Code Safety has lifted and is stuck open.
- A loss of all off-site power.
- DG-1 is out of service.
- DG-2 started and loaded.
- RCS Pressure is 812 psia and slowly lowering.
- Pressurizer level is 50% and rising slowly.
- Both Steam Generators are 730 psia and slowly lowering.
- Thot = 538°F slowly lowering
- Tcold = 508°F slowly lowering
- CET = 545°F and slowly lowering

With these conditions stop and throttle should _____.

A. Be performed.

B. ✔ Not be performed, because subcooling is not adequate.

C. Not be performed, because only one train of ECCS is operating.

D. Not be performed, because Core differential temperature is > 20°F.

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

APE: 008 Pressurizer (PZR) Vapor Space Accident (Relief Valve Stuck Open)

AK3. Knowledge of the reasons for the following responses as they apply to the Pressurizer Vapor Space Accident: AK3.05 ECCS termination or throttling criteria
RO 4.0 CFR 55.41 (b) (5)

LP 7-18-13 EO 3.1 GIVEN a copy of the HPSI Stop and Throttle Criteria floating step, EXPLAIN the four indications used to determine that HPSI Stop and Throttle Criteria are met.

Justification for Distractors

A. Plausible, because Pressurizer level is above 10% and not lowering. Not correct because sub-cooling is inadequate
B. If Sub-cooled Natural Circulation has not developed, the higher priority is keeping the core covered and maintaining heat removal than being concerned with filling the Pressurizer.
C. Plausible, because it would appear to be non-conservative to reduce the only running ECCS train.
D. Plausible, because core differential temperature must be higher than forced circulation differential temperature in order to develop natural circulation.

References
From the TBD for EOP-00 for HPSI Stop and Throttle step 10.1.

Cog Level - High The applicant is required to analyze a set of conditions and diagnose the proper operator response.

New

Validators LOD 3

Rev 1

KA#:	000008 AK3.05	Bank Ref #:	
LP# / Objective:	07-18-13 03.01	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	EOP-00	Handout:	

(3)QUESTION NUMBER: 003

The plant was at 100% power when it experienced a loss of inventory event. The following conditions exist 30 minutes after the reactor trip:

- All ESF and Safety Injection Systems operated as designed.
- All Reactor Coolant Pumps have been stopped.
- Pressurizer level 0%
- RVLMS 8%
- RCS Pressure 750 psia lowering
- Steam Generator Pressure (Both) 840 psia lowering
- Average CET Temperature 509°F lowering
- Hot Leg Temperature 514°F lowering
- Cold Leg Temperature 505°F lowering

1) Which of the following methods are providing core heat removal, and
2) Is the heat removal method adequate?

	Heat Removal	Adequate or In-adequate
A.	Two-Phase Natural Circulation	Adequate
B.	Two-Phase Natural Circulation	In-adequate
C✓	Safety Injection flow out the break	Adequate
D.	Safety Injection flow out the break	In-adequate

EPE: 011 Large Break LOCA, EK1 Knowledge of the operational implications of the following concepts as they apply to the Large Break LOCA :EK1.01 Natural circulation and cooling, including reflux boiling.

Explaination of meeting K/A: A large break LOCA is one where the primary depressurizes below the secondary, this removes the ability to produce any type of natural circulation, since both systems are at saturation. This question is testing the students knowledge that natural circuation will not occur. Picking either A or B indicates the student is not aware of this concept. The conditions, which were run on the simulator to confirm, provide some of the indications that natural circulation could be occuring (Thot and Tcold within 50 degrees, and Thot within 10 degrees of CETs, and temperatures lowering).

The SI flow will be sufficient if the core is covered, CETs are not superheated, temperatures are lowering.

RO 4.1 10 CFR 55.41 (b) (5)

LP 7-18-13, EO 3.5 State from memory the four indications used to verify the development of subcooled natural circulation.

Justification for Distractors

A. Plausible, because the system is at saturation with Tcold less than Thot, and Thot is within 10 degrees of the CETs, and heat removal is being met. However, natural circulation cannot take place because the Steam Generators are at a higher temperature than the RCS and they are actually a heat source.
B. Plausible, for "in-adequate" because in natural circulation the core delta T would be larger 30 minutes after a reactor trip, making it in-adequate. However, although some of the conditions for natural circulation are met the Steam Generators are at a higher temperature than the RCS and they are actually a heat source.
C. This answer is correct for 30 minutes after a reactor trip and both (or even a single train of HPSI) operating and CETs do not indicate superheat. Primary pressure less than steam generator pressure is an indicator of a large break LOCA and flow out the break will be sufficient to remove decay heat. On a small break LOCA the Steam Generators and natural circulation are necessary to remove decay heat because SI flow is insufficient.
D. Plausible for "in-adequate," because the RVLMS and Pressurizer level have not been restored, and the system is still saturated and not subcooled.

References

TBD EOP/AOP Floating Step A. HPSI Stop and Throttle Criteria
EOP/AOP Attachment HR-30 Total SI Pump Flow to Match Decay Heat vs. Time After Trip

Cog Level - High The applicant is required to analyze a set of plant conditions and using system/plant knowledge determine the type of heat removal and determine if it is adequate.

New

Validators LOD 3

Rev 1

KA#:	000011 EK1.01	Bank Ref #:	
LP# / Objective:	7-18-13 03.05	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	EOP/AOP FLOATING	Handout:	

(4)QUESTION NUMBER: 004

The following conditions exist:

- The reactor is at 100% power.
- RCS pressure is 2100 psia.
- The RC-3A “SEAL LEAKAGE FLOW HI” annunciator is in alarm.
- VCT pressure is 45 psia.
- RC-3A middle seal inlet pressure is 270 psia.
- RC-3A upper seal inlet pressure is 100 psia.

Which of the following is correct about the condition of RC-3A’s seals?

A. Only the lower seal has failed.

B. Only the upper seal has failed.

C. Both the lower and middle seals have failed.

D✔ Both the upper and middle seals have failed.

APE : 015/017 Reactor Coolant Pump (RCP) MalfunctionsAK2. Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions (Loss of RC Flow) and the following:AK2.07 RCP seals.

RO 2.9 10 CFR 55.41 (b) (7)

Justification for Distractors

A. Plausible if the student believes the lower seal is plugged, because lower seal inlet pressure is RCS pressure.

B. Plausible, because the upper seal has failed, but it is not the only seal that has failed.

C. Plauslible because the middle seal has failed, but not the lower seal.

D. **This is the only correct response, both seals are failed, but not the lower seal. The lower seal is holding back RCS pressure and the other two seals are providing very little, less than 200 psid each of lpressure breakdown, which constitutes a failed seal.**

References
ARP CB-1,2,3/A-6 Window A-1

Cog Level - High, because it requires the student to compare what he knows to be the normal seal breakdown pressures with those given. A seal package has four seals. The lower seal, middle seal, upper seal, and the vapor seal. Bleedoff to the VCT is from the cavity between the upper and vapor seal. With three good seals (excluding the vapor seal), pressure is broken down in three equal steps excluding VCT pressure. Two good seals halve the pressure and one good seal hold back all the RCS pressure. It becomes more difficult when a seal is not totally failed and providing some breakdown. AOP-35 defines a failed seal as one that has < 200 psid.

Bank 7-11-20 #14

Validators LOD 3

Rev 1

KA#:	000017 AK2.07	Bank Ref #:	07-11-20 014
LP# / Objective:	07-11-20 01.07D	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NRC 04 EXAM
Reference:		Handout:	

(5)QUESTION NUMBER: 005

With the plant at 100% power, a small RCS leak has developed in containment. In an attempt to locate and isolate the leak, charging and letdown flow paths have been isolated.

If the leak is in an RCS cold leg, what is the expected VCT level in 10 minutes, if VCT level was 50% when charging and letdown were isolated?

A. 50%

B. ✔ 51 - 52%

C. 48 - 49%

D. > 52%

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

APE: 022 Loss of Reactor Coolant Makeup
AA1. Ability to operate and/or monitor the following as they apply to the Loss of Reactor Coolant Makeup:AA1.08 VCT level.

RO 3.4 CFR 55.41 (b) (7)

LP 7-17-33 EO 1.2 DESCRIBE how the plant responds to a Reactor Coolant Leak in terms of how specific equipment is affected and how it affects overall plant operation and reliability.

Justification for distracters:

A. Plausible, because it could appear correct if the student forgets RCP bleedoff is still going to the VCT.
B. In this scenario the only input to the VCT is reactor coolant bleedoff, which is 1 gpm/RCP. The VCT is 25 gallons/% level. Therefore, VCT level will rise slowly at 1.0% every six minutes. Thus only answer B is correct.
C. Plausible, because the student could use the wrong sign for division.
D. Could appear correct if the student uses the wrong units. For instance, the thumb rule for the pressurizer is 50 gallons/% level.

References

AOP-33 **NOTE:** VCT level will tend to rise approximately 1% every 6 minutes due to Reactor Coolant Pump Bleedoff flow.

Cog Level – Low: There is a note in a procedure that provides the information, therefore it is recall.

New

Validators LOD 3

Rev 1

KA#:	000022 AA1.08	Bank Ref #:	
LP# / Objective:	07-17-33 01.02	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	AOP-33	Handout:	

(6) QUESTION NUMBER: 006

Off-Site power is lost during Shutdown Cooling System operation.

1) What action (if any) is the operator to perform after the Emergency Diesel Generators (EDGs) start to initiate shutdown cooling flow, and

2) What parameter is verified to ensure adequate heat removal once the LPSI pump is restarted?

	Action	Parameter
A.	Manually restart the LPSI pump that was running.	<176°F on LPSI pump suction temperature TR-346
B.	Manually restart the LPSI pump that was running.	≥1500 gpm on LPSI/SHTDN CLG Flow Controller
C.	No action is necessary, the EDGs will pick up the LPSI pump as a dead bus load.	<176°F on LPSI pump suction temperature TR-346
D. ✔	No action is necessary, the EDGs will pick up the LPSI pump as a dead bus load.	≥1500 gpm on LPSI/SHTDN CLG Flow Controller

APE: 025 Loss of Residual Heat Removal System (RHRS)2.4 Emergency Procedures / Plan (continued) 2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.

K/A fit: The applicant is being asked to provide system/parameter knowledge to choose the correct action required to re-establish SDC flow.

RO 4.0 10 CFR 55.41 (b) (7)

Lp 7-11-22 EO 1.10,

Justification for Distractors

A. Plausible if the student forgets the pump breaker does not trip open on under voltage, and that the <176°F on LPSI pump suction temperature only applies when CCW cooling is isolated to the shutdown cooling HX.

B. Plausible if the student knows that ≥1500 gpm on LPSI/SHTDN CLG Flow Controller is the minimum required flow for SDC. It is incorrect because the LPSI pump is started as a dead load.

C. Plausible because the LPSI pump is started as a dead load. However, incorrect because, the <176°F on LPSI pump suction temperature only applies when CCW cooling is isolated to the shutdown cooling HX..

D. Correct, because the LPSI pump is started as a dead load and 1500 gpm is the required minimum flow. The UV contact is jumpered out to ensure SDC flow will return ASAP following restoration of power. In AOP-19 the operator is directed to Ensure a LPSI pump is running and then manually adjust the flow control valve FCV-326 to achieve 1500 gpm. As long as 120 volt AC power or instrument air are not lost, FCV-326 will stay in position, otherwise it fails open.

References
AOP-19, Loss of SDC
OI-SC-1, SDC Initiation

Cog Level – Low

New

Validators LOD 2.5

Rev 1

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	000025 2.4.21	Bank Ref #:	
LP# / Objective:	7-11-22 01.10	Exam Level:	RO
Cognitive Level:	LOW	Source:	BANK
Reference:	AOP-19	Handout:	

(7) QUESTION NUMBER: 007

The plant is being cooled down on Shutdown Cooling using Shutdown Cooling Heat Exchanger AC-4A. With the RCS at 290°F and 235 psia, CCW cooling to AC-4A is lost due to a CCW surge tank rupture.

Which of the following actions, in accordance with AOP-11, Loss of CCW, is the operator directed to take to re-establish cooling for the Shutdown Cooling Heat Exchanger?

A. Place AC-4B in service using the CCW system.

B. ✔ Establish Raw Water backup cooling to AC-4A.

C. Start a HPSI pump to provide injection into the RCS.

D. Use hoses and line up fire water to the secondary side of AC-4A.

APE: 026 Loss of Component Cooling Water (CCW) AA1. Ability to operate and / or monitor the following as they apply to the Loss of Component Cooling Water: AA1.03 SWS as a backup to the CCWS .

K/A fit: the applicant is being asked to provide knowledge of mitigating actions for a loss of CCW.

RO 3.6 CFR55.41 (b) (10)

LP 7-17-11 EO 1.3 Describe the major recovery actions of this AOP.

Justification for Distractors

A. Plausible, because AC-4B is the other train of shutdown cooling. Incorrect because a loss of CCW affects both trains.

B. Correct in accordance with AOP-11. This will provide the greatest amount of heat sink in this situation.

C. Plausible, because the third HPSI pump is not required to be disabled (Pull-to-Lock) until the RCS is below 270°F, it could be used to provide cool water to the RCS and core. Incorrect, because this will not restore shutdown cooling, it would only replace inventory loss.

D. Plausible, because this is a step in AOP-18, which AOP-11 will direct the operator to, but it is incorrect, because it is only used if the Raw Water Pumps cannot be started.

References

AOP-11, Loss of CCW
AOP-19, Loss of Shutdown Cooling

Cog Level – Low

New

Validators LOD 2.0

Rev 1

KA#:	000026 AA1.03	Bank Ref #:	
LP# / Objective:	7-17-11 01.03	Exam Level:	RO
Cognitive Level:	LOW	Source:	BANK
Reference:	AOP-19	Handout:	

(8)QUESTION NUMBER: 008

What is the purpose of closing the Volume Control Tank (VCT) outlet valve (LCV-218-2) during an ATWS event?

A. To prevent lifting VCT Relief Valve CH-159.

B. To prevent gas binding of the charging pumps.

C✔ To allow gravity feed from the Boric Acid StorageTanks (CH-11A/B).

D. To prevent VCT low level from opening LCV-218-3, Charging Pump Suction SIRWT Isolation Valve.

EPE : 029 Anticipated Transient Without Scram (ATWS) 2.1.28 Knowledge of the purpose and function of major system components and controls.

K/A fit: The applicant is being asked for the reason for an action taken in an abnormal conditon.

RO 4.1 10 CFR 55.41 (b) (7)

LP 7-17-03 EO 1.3

Justification of Distractors

A. Plausible if the student does not know that the VCT relief valve is upstream of LCV-218-2. This could occur if LCV-218-2 was left open and the VCT outlet check valve did not seat. Since the VCT does not have a pressure control valve, pressure would rise if level rose. Depending on how many charging pumps are running, the Boric Acid pumps put out more flow than the charging pumps produce, which could cause backflow into the VCT with the check valve open. The VCT normal range of pressure is 25 - 35 psig. The boric acid pumps will produce close to 100 psi of head. The Boric Acid pump output is 180 gpm which would exceed even 3 charging pumps at 132 gpm total.

B. Plausible, automatic operation of the charging pumps will lower VCT level and the pumps will not trip on low suction pressure until 10 psia, which is below atmospheric pressure; therefore, inleakage would gas bind the pumps if leakage was present.

C. **Correct answer from the TBD for AOP-03.**

D. Plausible, because this will prevent level from lowering once LCV-218-2 is closed; however, this happens automatically, if the valve was not closed on low level. Leaving the valve open prevents gravity feed.

References
ARP CB-1,2,3 A2-L VCT Hi/Lo Pressure
TBD AOP-03

Cog Level – Low

Bank 7-17-03 #4

Validators LOD 2.0

Rev 1

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	000029 2.1.28	Bank Ref #:	7-17-3 #4
LP# / Objective:	7-17-03 01.03	Exam Level:	RO
Cognitive Level:	LOW	Source:	BANK
Reference:	TBD AOP-03	Handout:	

(9)QUESTION NUMBER: 009

The plant experienced a steam generator tube rupture (SGTR) and operators are prepared to isolate the affected Steam Generator. The following condition exits:

- Pressurizer Pressure instruments are inoperable.

Using the table from Attachment PC-12, RCS Pressure-Temperature Limits, which of the following combinations will meet the procedural requirement of EOP-04, SGTR to isolate the affected Steam Generator, and ensure adequate NPSH for the Reactor Coolant Pumps?

	Pressurizer Vapor Space Temperature	RCS Tcold
A.	545°F	514°F
B.	532°F	508°F
C✔	508°F	465°F
D.	450°F	420°F

EPE: 038 Steam Generator Tube Rupture (SGTR) EK1 Knowledge of the operational implications of the following concepts as they apply to the SGTR:EK1.01 Use of steam tables.

K/A fit: The applicant must use a table of adequate NPSH requirements, which are based on steam tables and RCP operating characteristics to determine NPSH requirements.

RO 3.1 10 CFR 55.41 (b) (5)

LP 7-18-14 EO 1.4 Given a copy of the Technical Basis Documents (TDBs), explain the basis behind the major operator actions contained in EOP-04, SGTR.

Handout: table page ONLY from Attachment PC-12, RCS Pressure-Temperature Limits

This question meets the K/A because it requires the applicant to;
1) use the steam tables to determine RCS pressure from the steam space temperatures given based on the principle that the pressurizer is a saturated system,
2) recognize that a cooldown and depressurization will not occur for a steam generator tube rupture until the Standard Post Trip Actions are complete; therefore, RCS and Steam Generator temperatures are only 1-2 degrees apart with forced circulation,
3) interpolate using the steam tables and the table from Attachment PC-12, RCS Pressure-Temperature Limits,
4) make a judgement based on calculations and interpolation which of the choices will meet RCP NPSH requirements.

Although the possibility of the condition where all pressure instruments are inoperable

Justification for Distractors

A. Plausible, because saturation pressure for 545°F is 1000 psia, this would mean that the RCS temperature could be no higher than 516°F to meet the RCP NPSH limit, and 514°F is below that temperature limit, which would make it acceptable from a NPSH standpoint. However, procedurally,the RCS temperature must be below 510°F to ensure the Steam Generator Safeties do not lift; therefore it is incorrect.

B. Plausible, because 510°F is the temperature limit for ensuring the secondary safeties will not lift. It is incorrect, because saturation pressure for 532°F is 900 psia and the maximum temperature for this pressure to ensure adequate NPSH IAW ATT. PC-12 is 502°F.

C. **This combination meets both the requirement to prevent the secondary safeties from lifting, and NPSH requirement for the RCPs.**

D. Plausible, because it meets the "below 510°F", but incorrect because the temperature is too high to support adequate NPSH for the RCPs.

References

Attachment PC-12, RCS Pressure-Temperature Limits
EOP-04, SGTR

Cog Level - High The applicant is required to interpolate information from a table provided to determine conditions for adequate NPSH.

New

Validators LOD 3.5

Rev 1

KA#:	000038 EK1.01	Bank Ref #:	
LP# / Objective:	7-18-14 01.04	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	EOP-04	Handout:	PC-12

(10) QUESTION NUMBER: 010

The Engineered Safeguards Control System is in its normal 100% power lineup when the following plant conditions occur.

- Pressurizer Pressure Safety Channel meters indicate the following:

A/PIA-102X	1890 psia	A/PIA-102Y	2500 psia
B/PIA-102X	1780 psia	B/PIA-102Y	1617 psia
C/PIA-102X	1777 psia	C/PIA-102Y	1599 psia
D/PIA-102X	1780 psia	D/PIA-102Y	1596 psia

What is the condition of the PPLS lockout relays?

A. ✔ 86A/PPLS tripped
86B/PPLS tripped
86A1/PPLS tripped
86B1/PPLS tripped

B. 86A/PPLS reset
86B/PPLS reset
86A1/PPLS reset
86B1/PPLS reset

C. 86A/PPLS reset
86B/PPLS tripped
86A1/PPLS reset
86B1/PPLS tripped

D. 86A/PPLS tripped
86B/PPLS tripped
86A1/PPLS reset
86B1/PPLS reset

APE: 040 Steam Line RuptureAA2. Ability to determine and interpret the following as they apply to the Steam Line Rupture: AA2.04 Conditions requiring ESFAS initiation.

K/A fit: The applicant must use system knowledge and interpret indications to determine if ESFAS (PPLS) actuation should be occuring.

RO 4.5 10 CFR 55.43 (b) (5)

LP 7-12-14 EO 1.2 Explain how each prime initiation signal is developed.

Justification for Distractors

A. **Correct answer: A Steam line rupture (UHE) results in lowering Pressurizer level and pressure due to shrink. Therefore, PPLS is a valid indicator of a UHE. PPLS is a 2/4 logic with a setpoint at 1600 psia. Both 86A and B PPLS will trip as will the derived relays 86A1 and B1.** As a distractor, A/PIA-102Y is failed high which causes further confustion The X Channels indicate the TM/LP calculated trip setpoint, not actual pressure.

B. Plausible, because the block logic is a selective 2/4 A and C, or B and D. This has created a common misconception as to the actual trip logic.

C. Plausible if the student's misconception is that C and D only actuate the B train of ESF.

D. Plausible if the student's misconception is that all four Safety Channels must be in trip to actuate the Derived relays.

References

Lesson Plan 7-12-32

Cog Level – High The applicant must use system knowledge and interpret indications during an abnormal condition to determine if ESFAS (PPLS) actuation should be occuring.

New

Validators LOD 4.0

Rev 1

KA#:	000040 AA2.04	Bank Ref #:	
LP# / Objective:	7-12-14 01.02	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	BANK	Handout:	

(11) QUESTION NUMBER: 011

At 0900 hours, the following conditions existed and the reactor was manually tripped:

- RCS Tcold 548°F rising
- Pressurizer Pressure 2180 psia rising
- Steam Generator RC-2A Pressure 880 psia rising
- Steam Generator RC-2B Pressure 880 psia rising
- Steam Generator RC-2A Level 65% NR stable
- Steam Generator RC-2B Level 44% NR lowering
- Containment Pressure 2.1 psig rising
- Process and Area Radiation Monitors No Alarms, No upward trends

At 0910 hours the standard post trip actions are completed and the conditions are:

- RCS Tcold 525°F lowering
- Pressurizer Pressure 1850 psia lowering
- Steam Generator RC-2A Pressure 850 psia stable
- Steam Generator RC-2B Pressure 600 psia lowering
- Steam Generator RC-2A Level 65% NR rising
- Steam Generator RC-2B Level 10% NR lowering
- Containment Pressure 4.6 psig rising
- Process and Area Radiation Monitors No Alarms, No upward trends

1) What procedure is used to address the current conditions?
2) What event(s) is/are taking place in containment to cause these conditions?

	Procedure	Event
A.✔	EOP-05, Uncontrolled Heat Extraction	Unisolable loss of feedwater
B.	EOP-05, Uncontrolled Heat Extraction	Steam line break
C.	EOP-06, Loss of All Feedwater	Unisolable loss of feed water
D.	EOP-20, Functional Recovery	Steam Line Break & Steam Generator Tube Rupture

APE: 054 Loss of Main Feedwater (MFW) AK1. Knowledge of the operational implications of the following concepts as they apply to Loss of Main Feedwater (MFW): AK1.01 MFW line break depressurizes the S/G (similar to a steam line break)

RO 4.1 10 CFR 55.41 (b) (10)

LP 7-18-16 EO 1.5 State from memory the contingency action in EOP-06 which requires the operator to GO TO EOP-05, Uncontrolled Heat Extraction.

Justification for Distractors

This question meets the K/A because it is an operational implication to determine the meaning of the indications in order to determine the correct mitigating strategy. It is testing knowledge of the purpose or function of the EOP.

A. **Correct Answer: an unisolable feedwater line break in containment will initially provide indications of a loss of heat sink due to loss of cold feedwater flow to the steam generator. This results in temperature and pressure in the primary and secondary rising, with a resultant lowering of level in the affected steam generator. Since this event is in containment the containment pressure will rise. After the steam generator level falls below the feedring, steam will exit the steam generator and it will act as a UHE to cooldown the primary, and lower steam generator pressure. If the operators go to EOP-06 for a loss of feedwater, the procedure will direct them to EOP-05 for uncontrolled heat extraction, because the steam generator needs to be isolated to limit the cooldown.**
B. Plausible, because the unisolable feedwater line break appears as a steam line break once the feedring is uncovered. However, this is incorrect, because a steam line break will not initially cause temperature and pressure in the primary and secondary to rise.
C. Plausible, because feedwater has been lost to the B Steam Generator; however, it is incorrect, because EOP-06 is for a loss of **ALL** feedwater, and A Steam Generator is still being feed. Level is going up, while the unit is cooling down.
D. Plausible, because a UHE and SGTR will both result in lowering primary system temperature and pressure. In addition, if the operator believed there were two events going on he could go to EOP-20. However, this is incorrect, because the reason for going to EOP-20 is a UHE and SGTR, and the lack of any radiation monitors indicate a primary to secondary leak is not in progress.

References

EOP-05, UHE
EOP-06 Loss of All Feedwater

Cog Level - High

NEW

Validators LOD 3.5

Rev 1

KA#:	000054 AK1.01	Bank Ref #:	
LP# / Objective:	7-18-16 01.05	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	EOP-05	Handout:	

(12) QUESTION NUMBER: 012

The reactor tripped from 100% power following a station blackout. The Equipment Operator reports that steps 1 and 2 of Attachment MVA-24 "Minimizing DC Loads" has been completed.

What additional action must be taken in the control room **before two hours** have elapsed since the loss of off-site power?

A. Transfer AI-179 to its emergency power source.

B. Transfer AI-41B to its emergency DC Power source.

C. ✔ Stop LO-4, the DC Oil Pump, once the turbine stops turning.

D. Stop LO-12B, the DC Seal Oil Pump, when the generator stops turning.

EPE: 055 Loss of Offsite and Onsite Power (Station Blackout)EA1 Ability to operate and monitor the following as they apply to a Station Blackout: EA1.04 Reduction of loads on the battery.
CFR 55.41 (b) (7) RO 3.5

LP 7-18-17 EO 2.3 GIVEN a copy of Attachment 6, EXPLAIN the steps necessary to minimize DC loads.

Justification for distracters:

A. Plausible. because AI-179 is normally powered from DC Bus 2, although DC Bus 2 is not on its charger, due to D2 not starting, it is not a loss of the DC bus. The battery is now carrying the DC loads and that is why loads are minimized. However, this is incorrect, because AI-179 is not used during a station blackout, only during a control room evacution.
B. Plausible, because with DC Bus 2 not on its charger, power will drain down and if power is not restored to the charger, DC load will have to be transferred to DC bus 1 which is the emergency power supply. However, this is incorrect, because both DC batteries are draining down at the same time, and other actions take care of this.
C. DC loads are minimized to extend battery life following a loss of power to the battery chargers. LO-4 is stopped when the turbine stops turning making C the correct answer
D. Plausible, because it will reduce load on the Batteries; however, it is incorrect because LO-12B is not stopped until 2 hours. This gives time for hydrogen to be safely vented from the main generator.

References

EOP/AOP MVA-AC Attachment 24 Minimizing DC Loads.
FCS Lesson Plan / Objective 0718-17 02.03
GIVEN a copy of Attachment 24, EXPLAIN the steps necessary to minimize DC loads.

Cog Level – Low: It is a procedurally driven step; and therefore, recall.

Bank 7-18-17 #21

Validators LOD 2.5

Rev 1

KA#:	000055 EA1.04	Bank Ref #:	7-18-17 #21
LP# / Objective:	07-18-17 02.03	Exam Level:	RO
Cognitive Level:	LOW	Source:	BANK
Reference:	EOP/AOP ATT 24	Handout:	

(13) QUESTION NUMBER: 013

The plant was at 100% power when it experienced a loss of all off-site power. The following conditions exist:

- Both Diesel Generators have started and loaded.
- The BOPO is steaming with HCV-1040, Atmospheric Dump Valve.
- FW-10, Steam Driven Auxiliary Feedwater Pump (AFW) is being used to feed the Steam Generators.
- T_{cold} = 528°F
- T_{hot} = 548°F
- CETs = 632°F
- Pressurizer level is 20%
- Pressurizer pressure = 2060 psia.
- Both Steam Generator Pressures = 855 psia.
- Both Steam Generator Levels = 85% Narrow Range.

Which of the following actions will help to improve core heat removal?

A. ✔ Raise Pressurizer level

B. Raise Steam Generator Pressure

C. Go to RESET on Backup Heater switches

D. Stop FW-10 and start FW-54, Diesel Driven AFW pump.

APE: 056 Loss of Offsite Power AK1. Knowledge of the operational implications of the following concepts as they apply to Loss of Offsite Power: AK1.03 Definition of subcooling: use of steam tables to determine it.
CFR 55.41 (b) (8) RO 3.1

LP 7-18-17 EO 3.1 STATE from memory the four indications used to verify the development of Subcooled Natural Circulation.

A. From the steam tables the saturation temperature for 2060 psia is 640°F. During natural circulation, Attachment PC-12 directs the operator to use CETs for the subcooled curve. This is because there is not enough mixed flow in the hot legs for indication to be valid. 640°F - 632°F = 8°F subcooled. Subcooled natural circulation requires 20°F subcooling to be adequate. To increase subcooling, the saturation Temperature/Pressure of the Pressurizer must be raised. This can only happen if the Pressurizer heaters are energized, and this cannot happen below 32% level because of the low level cutout. Therefore, level must be raised to energize the heaters.

B. Plausible, because one might think that raising Steam Generator pressure will raise RCS pressure; however, this reduces RCS heat removal since steam flow must be lowered to raise Steam Generator pressure.

C. Plausible, because, going to RESET would allow the heaters to re-energize following loss of power to the MCCs. It is incorrect, because the low level cutout will not allow the heaters to energize, level must be raised first.

D. Plausible, because FW-54 can provide more flow than FW-10; however, a steaming path would be lost for heat removal, and the same flow rate from either pump is required to maintain Steam Generator levels.

References

Steam Tables
Attachment PC-12 RCS Pressure-Temperature Limits

Cog Level - High

New

Validators LOD 3.0

Rev 1

KA#:	000056 AK1.03	Bank Ref #:	
LP# / Objective:	07-18-17 03.01	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	EOP/AOP ATT PC 12	Handout:	

(14) QUESTION NUMBER: 014

While at 100% power, the control room has implemented Section IV of AOP-16, Loss of Instrument Bus AI-40C. The following conditions are present:

- Annunciator CC WATER FROM RC-3B SEAL COOLER TEMP HI
- Annunciator CC WATER FROM RC-3D SEAL COOLER TEMP HI
- ERF RC-3B Seal Bleedoff Temperature is 170°F rising
- ERF RC-3D Seal Bleedoff Temperature is 170°F rising
- ERF RC-3B Lower Seal Cavity Temperature is 140°F and rising
- ERF RC-3D Lower Seal Cavity Temperature is 140°F and rising
- Seal Bleedoff Flow for each RCP is 1.0 gpm and steady.

Which of the following actions should be taken and what is the reason for the actions?

	Action	Reason
A.	Trip the reactor and then trip the reactor coolant pumps .	This is an indication of loss of CCW.
B.	Enter AOP-35 (Reactor Coolant Pump Malfunctions).	This is an indication of failed RCP seals.
C✔	Throttle further **OPEN** the CCW flow to RC-3B and RC-3D.	to restore adequate cooling water flow.
D.	Throttle further **CLOSED** the CCW flow to RC-3A and RC-3C.	to restore adequate cooling water flow.

APE: 057 Loss of Vital AC Electrical Instrument Bus AK3. Knowledge of the reasons for the following responses as they apply to the Loss of Vital AC Instrument Bus: AK3.01 Actions contained in EOP for loss of vital ac electrical instrument bus.

NOTE: This question is written for AOP actions because FCS does not have loss of Instrument Bus actions in EOPs. See References below.

RO 4.1 10CFR 55.41 (b) (5)

AK3.01 Actions contained in EOP for loss of vital ac electrical instrument bus.

LP 7-17-16 EO 1.2 Describe how the plant responds to a loss of instrument bus power in terms of how specific equipment is affected and how it affects overall plant operation and reliability. EO 1.3 Describe the major recovery actions for this AOP.

Justification of Distractors

A. Plausible, because rising CCW and seal temperatures are indicative of loss of heat sink. It is incorrect because only two pumps are affected, and not all RCPs.

B. Plausible, becaue rising temperatures are indicative of failed RCP seals; however, it is correct, because seal bleedoff flow is steady.

C. **This is the correct answer and is addressed by the ARP steps. The RO should know the mitigating strategy of opening the CCW flow control valves that are still throttled to raise flow, because loss of a vital 120 VAC bus results in two flow control valves failing open due to loss of control power, this results in robbing CCW flow from the other two RCPs**.

D. Plausible, because if you throttled the affected valves (ones that lost power) it would result in forcing flow to the unaffected valves (did not lose control power). This is incorrect, because control power has been lost and the valves can not be throttled closed from the control room.

References
AOP-16 Section IV Loss of Instrument Bus AI-40C
ARP - CB-1,2,3/A1 Annunciator A-5L
AOP-35, RCP Malfunctions

Cog Level - High The applicant must interpret the indications given and using system knowledge diagnose the cause and subsequent corrective actions.

Bank AOP-16-RO #7

Validators LOD 3.0

Rev 1

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	000057 AK3.01	Bank Ref #:	LR-RO-AOP-16 #7
LP# / Objective:	7-17-16 01.02	Exam Level:	RO
Cognitive Level:	LOW	Source:	
Reference:	AOP-16	Handout:	

(15) QUESTION NUMBER: 015

The plant is in Mode 2, preparations are being made to raise reactor power above 2%.

- All 4160 V Buses are being supplied from 161 KV.
- 120 VAC system is in a normal lineup.
- 125 VDC system is in a normal lineup.
- Raw Water Pump AC-10A and AC-10C are running.

Which one of the following is a plant indication or condition that would occur if there was a fault on DC Bus 1 (assume no operator actions)?

A. A loss of control power to DG-2.

B. Raw Water Pumps AC-10B and D are running.

C. Instrument Bus AI-40C on its Swing Inverter EE-8T.

D. ✔ INVERTER A TROUBLE annunciator is in alarm.

APE: 058 Loss of DC Power AA1. Ability to operate and/or monitor the following as they apply to the Loss of DC Power:AA1.03 Vital and battery bus components.

RO 3.1 10 CFR 55.41 (b) (7)

LP 7-17-16 EO 1.2 Describe how the plant responds to a loss of instrument bus power in terms of how specific equipment is affected and how it affects overall plant operation and reliability. EO 1.3 Describe the major recovery actions for this AOP.

Justification for Distractors

A. Plausible, because DC Bus 1 is the alternate power supply to DG-2 and will be lost, incorrect because it is not lined up to DG-2 in this condition.

B. Plausible, if the student thinks the running pumps will trip on loss of DC control power Then the pumps on the alternate bus auto start. Incorrect, because the breakers will not trip, nor can they be remotely, until DC control power for the 4160 V buses is switched to the emergency source.

C. Plausible, because AI-40C can be powered from EE-8T. It is incorrect, because it is not an indicator of a loss of the DC bus.

D. **This is the correct response in accordance with AOP-16, and ARP CB-20/A15 window A-6.**

References
AOP-16 Section VIII Los of DC Bus 1
ARP CB-20/A15 window A-6.

Cog Level - HighThe applicant must use system knowledge to determine which indication would result from the given conditions in an abnormal situation.

New

Validators LOD 4.0

Rev 2

KA#:	000058 AA1.03	Bank Ref #:	
LP# / Objective:	7-17-16 01.02	Exam Level:	RO
Cognitive Level:	HIGH	Source:	
Reference:	AOP-16	Handout:	

(16)QUESTION NUMBER: 016

The following conditions exist in the Raw Water (RW) System:

- RW Pumps AC-10C and D are running
- RAW WATER STRAINER B TROUBLE in alarm
- All 10 psig and 25 psig Header Pressure lights are ON
- West RW Supply Header Flow (FIC-2891) = 6800gpm
- East RW Supply Header Flow (FIC-2890) = 500 gpm
- Both RW Strainers AC-12A/B in AUTO and running
- AC-12A (West Header) backwash valve reported closed
- AC-12B (East Header) backwash valve reported open with flow
- The Water Plant Operator reports AC-12B Strainer differential is 10 psid.

Which of the following will lower the differential pressure on AC-12B? (Refer to Raw Water System simplified diagram handout.)

A. ✔ Stop Raw Water Pump AC-10D and Close HCV-2876A/B, when blockage clears, reopen HCV-2876A/B.

B. Blow down FIC-2890, East RW Supply Header Flow Indicator.

C. Place AC-12A in MANUAL backwash and ensure backwash valve HCV-2805A is open.

D. Split the headers by Closing HCV-2894, HCV-2876A/B, HCV-2879A/B, and HCV-2883A/B.

062 Loss of Nuclear Service Water, AA2. Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: AA2.03 The valve lineups necessary to restart the SWS while bypassing the portion of the system causing the abnormal condition.

RO 2.6 10 CFR 55.43 (b) (5)

LP 7-17-18 EO 1.2 Describe how the plant responds to a loss of Raw Water in terms of how specific equipment is affected and how it affects overall plant operation and reliability. EO 1.3 Describe the major recovery actions for this AOP.

This question uses a handout for the RW system.

Justification for Distractors

A. Correct Answer, the indications given are for a plugged RW Strainer on the East Header. IAW ARP for RAW WATER SUPPLY HEADER PRESS LO

B. Plausible, because there are indications for a plugged RW flow indicator, which occurs with river water. Incorrect, because low pressure would not be an indicator of a plugged flow device.

C. Plausible, placing the other strainer in continous backwash would be a preventative action to prevent it from plugging also; however, this action will not alleviate the condition on the B strainer.

D. Plausible, becaue low pressure, and low flow are indicative of a system leak and AOP-18 actions direct the operator to isolate the leak. However, this is not the correct action because, flow is abnormally high on one header due to the backpressure from the plugged header and the low pressure condition is not indicated generally throughout the system.

References

AOP-18, Loss of RW
ARP for RAW WATER SUPPLY HEADER PRESS LO
ARP for RAW WATER STRAINER A TROUBLE
LP 7-11-19

Cog Level - High

New

Validators LOD 4

Rev 2

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	000062 AA2.03	Bank Ref #:	
LP# / Objective:	7-17-18 01.02	Exam Level:	RO
Cognitive Level:	HIGH	Source:	
Reference:	AOP-18	Handout:	RW SYSTEM SIMPLIFIED

(17)QUESTION NUMBER: 017

The plant is in hot shutdown following an event.

- 4160 V Bus 1A3 is de-energized.
- Bearing Water Pump AC-9B is running.
- PLANT AIR PRESS LO alarm received.
- Instrument Air pressure is cycling between 94 - 101 psig.
- Air Compressor CA-1B is maintaining air pressure.

What action can you direct the Water Plant Operator to perform that will stabilize instrument air pressure in a normal pressure band?

A. Start Bearing Water Pump AC-9A.

B. ✔ Place Air Compressor CA-1B in Continuous Service.

C. Open CA-197, Bypass Control Valve PCV-1752 Bypass Valve.

D. Close CA-121 Service Air Supply System Manual Isolation Valve.

APE: 065 Loss of Instrument Air 2.4.35 Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects.

This question meets the K/A because it has entry conditions for AOP-17 and has required actions for the auxiliary operator to take to restore normal operations.

RO 3.8 10CFR 55.41 (b) (10)

LP 7-17-17 EO 1.2 Describe how the plant responds to a loss of Instrument Air in terms of how specific equipment is affected and how it affects overall plant operation and reliability. EO 1.3 Describe the major recovery actions for this AOP.

Justification for Distractors

A. Plausible, Loss of the Running Bearing Water Pump is entry conditions for AOP-17, and without a bearing water pump, the running Air Compressor will eventally trip on high temperature. AOP-17 will direct the operator to start a bearing water pump, which could be started from the control room or locally. However, this will not stop the Air Compressor from cycling, and; therefore, is incorrect.

B. Correct, since 1A3 is de-energized and the running Air Compressor is cycling, it must be the one that is selected to STBY (stand by) and will maintain pressure in a lowwer than normal band. Whether there is a leak present or not, the standby air compressor will load and unload with normal air usage. In CS or Continuous service the running air compressor will load and unload at a higher (normal) pressure range. The operator must use his knowledge of system response and procedural actions to answer this question; therefore, this is High Cog

C. Plausible, because this is an action in AOP-17 that is taken if air pressure is low. It is incorrect, because the air pressure is not less than 78 psig, and the compressor will still cycle on and off with normal instrument air usage.

D. Plausible, because this valve will cycle open and closed between 80 and 85 psig and may isolate a leak; however, it is the wrong pressure range for the standby air compressor, and will not stop the standby from cycling on and off due to normal air usage.

References

OI-CA-1, Normal Operation Instrument Air
AOP-17, Loss Of Instrument Air

Cog Level - High

Exam Bank Significantly Modified 7-11-07 #22

Validators LOD 2

Rev 2

KA#:	000065 2.4.35	Bank Ref #:	7-11-07 #22
LP# / Objective:	7-17-17 01.02	Exam Level:	RO
Cognitive Level:	HIGH	Source:	
Reference:	AOP-17	Handout:	

(18) QUESTION NUMBER: 018

The Plant is operating at full power when a disturbance on the grid causes the following Main
Generator indications:

- 536 MWe
- 200 MVARs Lagging
- 15,000 Generator Amps

The Control Room Supervisor then directs the BOPO to adjust MVARs to 50 MVARs lagging. Upon completion of adjusting MVARs, Generator Amps will be ___(1)___ and MWe will be ___(2)___.

	(1) Generator Amps	(2) MWe
A.	lower	lower
B. ✔	lower	unchanged
C.	unchanged	lower
D.	unchanged	unchanged

APE: 077 Generator Voltage and Electric Grid Disturbances AK2. Knowledge of the interrelations between Generator Voltage and Electric Grid Disturbances and the following: AK2.07 Turbine / generator control.

K/A fit: The applicant is being asked to use knowledge of operating characteristics of the main generator as it has been affected by a grid disturbance, and how the generator responds to control manipulation (expected response).

RO 3.6 10 CFR 55.41 (b) (5) RO level because it asks about operating characteristics of components the RO operates.

LP 7-13-06 EO 1.0 Explain the principles of operation of the Main Generator and the Alterex exciter genrator (alternator). 1.1 Explain how the main generator is electrically excited.

Justification for Distractors

A. Plausible if the student believes that MWe will be affected by adjustment of MVARs.

B. CORRECT

C. Plausible if the student believes that the ammeter does not reflect changes in MVARs and that that MWe will be affected by adjustment of MVARs.

D. Plausible if the student believes that the ammeter does not reflect changes in MVARs.

References

Lesson Plan 7-13-06

Cog Level - High the applicant must apply GFE knowledge of generator characteristics and principles and apply those to the conditions stated to determine a new set of operating conditons.

Other Exam Bank - Palisades 2009 exam

Validators LOD 3

Rev 1

KA#:	000077 AK2.07	Bank Ref #:	
LP# / Objective:	7-13-06 01.00	Exam Level:	RO
Cognitive Level:	HIGH	Source:	PALISADES 2009 EXAM
Reference:		Handout:	

(19) QUESTION NUMBER: 019

During a plant startup AOP-02, Section IV – Unplanned or Uncontrolled CEA Withdrawal, was entered. To realign a CEA AOP-02 directs the operator to:

> "Operate the "MANUAL ROD CONTROL SWITCH" to move the selected CEA in a slow, smooth manner, preferably in short increments of three inches or less per 15 second time period."

What are two procedural bases for this direction?

A. Prevent a reactor trip on High Startup Rate, and
Ensure RCS Pressure does NOT go below 2075 psia.

B. Ensure RCS Pressure does NOT go below 2075 psia, and
Acceptable power distribution limits are maintained.

C. Prevent a reactor trip on High Startup Rate, and
Minimum shutdown margin is maintained.

D. ✔ Acceptable power distribution limits are maintained, and
Minimum shutdown margin is maintained.

APE: 001 Continuous Rod Withdrawal AK3. Knowledge of the reasons for the following responses as they apply to the Continuous Rod Withdrawal : AK3.02 Tech-Spec limits on rod operability.

K/A fit: The TS basis and the basis for the procedural step are the same, the procedure is written to ensure TS requirements are met.

RO 3.2 10 CFR 55.41 (b) (5) RO level, because the question is asking about the reason/bases for a step in the procedure.

LP 7-17-02 EO 1.6 LP 7-17-02 EO 1.6 Describe the Technical Specification LCO challenged by a CEA or Control System malfunction.

Justification for Distractors

A. Plausible, because inserting a CEA would lower power, lower pressurizer level and pressurizer pressure. Incorrect, because performing this evolution in short increments will prevent this, and it is not listed in TDB-AOP-02. In addition, Hi SUR will not occur because the rods are driven in in this situation and is; therefore; not the reason.

B. Plausible because Acceptable power distribution limits are maintained is correct, but Ensure RCS Pressure does not go below 2075 psia is not correct.

C. Plausible, because Minimum shutdown margin is maintained is correct, but Hi SUR will not occur because the rods are driven in in this situation and is; therefore; not the reason.

D. This is the correct answer IAW TDB-AOP-02, Section IV – Unplanned or Uncontrolled CEA Withdrawal

References

TDB-AOP-02, Section IV – Unplanned or Uncontrolled CEA Withdrawal

Cog Level - LOW memory

New

Validators LOD 3

Rev 1

KA#:	000001 K3.02	Bank Ref #:	
LP# / Objective:	7-17-02 01.06	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	TDB-AOP-02	Handout:	

(20) QUESTION NUMBER: 020

The plant is at 100% power.

Regulating Group 4 CEAs are being used for ASI control and were aligned at 122 inches. During performance of OP-ST-CEA-0003, Control Element Assembly (CEA) Partial Movement Check, Regulating Group 4 CEA # 1 was inserted to 116" withdrawn and would **not** return to its original position.

- The Long Term Steady State Insertion Limit at 100% power is 94.5” withdrawn.
- The PPDIL alarm is **NOT** present.

It has been determined the only malfunction with CEA #1 is that the brake will **not** release.

In accordance with Technical Specification 2.10.2, what action, if any, must be taken? (Reference COLR Figure 2)

A. ✔ Operation may continue at 100% Power.

B. Restore group alignment within one hour.

C. Reduce Reactor power to <70% power within one hour.

D. Determine the Shutdown Margin is satisfied within one hour.

APE: 005 Inoperable/Stuck Control Rod 2.1.32 Ability to explain and apply system limits and precautions.

RO 3.8 10 CFR 55.41 (b) (10)

LP 7-17-02 EO 1.6 Describe the Technical Specification LCO challenged by a CEA or Control System malfunction.

Note: consider giving figure2 TDB-VI Power Dependent Insertion Limit
This question is RO level because it is not asking about an LCO action statement that exceeds Limits, rod 41 is within 12" of its group, above LTSSILs and no PPDIL alarm is present. Operation may continue at 100% power.

Justification for Distractors

A. Correct answer in accordance with 2.10.2 (4) c. The brake, which stops rod movement from the CEDM (motor) does not prevent the rod from tripping, and is; therefore, not mechanical interference. In addition, the clutch disengages the motor from the CEA.

B. Plausible, because the procedures require the rods to be kept within 2" inches of the other rods in thier group; however, this is incorrect, because TS only requires them to be within 12"

C. Plausible, since this is an action for rods being out of alignment with the other rods in its group; however, this is only required when the alignment is between 12 - 18" or for a dropped CEA

D. Plausible, if the CEA is inoperable because it was untrippable this would be required; however, this is incorrect because the issue is with the brake, not the clutch or mechanical friction. The brake issue only prevents the rod from being driven, it does not preveent it from being tripped.

References

TS 2.10.2 Reactivity Control Systems and Core Physics Parameters Limits, Control Element Assemblies

Cog Level - Low The student must determine that the brake not releasing does not prevent the rod from tripping, determining that the rod is above the 114" Transient Insertion Limit, and then applying the LCO Limit to the condition.

New

Validators LOD 4.0

Rev 1

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	000005 2.1.32	Bank Ref #:	
LP# / Objective:	07-17-02 01.06	Exam Level:	RO
Cognitive Level:	HIGH	Source:	
Reference:	TECH SPEC	Handout:	COLR FIGURE 2

(21) QUESTION NUMBER: 021

A Steam Generator Tube Rupture has occurred on RC-2B. EOP-04, Steam Generator Tube Rupture is in progress.

A minimum RC-2B Steam Generator level of __(1)___ meets the intent of maintaining level in the procedurally directed band.

The reason for maintaining the procedurally directed band is for ____(2)____.

	___(1)____	_____(2)_____
A.	35% NR	Minimizing radioactivity release.
B.	35% NR	Ensuring AFW does not actuate.
C. ✔	44% NR	Minimizing radioactivity release.
D.	44% NR	Ensuring AFW does not actuate.

APE: 037 Steam Generator (S/G) Tube Leak AK3. Knowledge of the reasons for the following responses as they apply to the Steam Generator Tube Leak: AK3.07 Actions contained in EOP for S/G tube leak.

RO 4.2 10 CFR 55.41 (b) (10)

LP 7-18-04 EO 1.1 Explain the major strategy used to mitigate the consequences of a STGR.

FCS does not have an abnormal operating procedure that addresses a steam generator tube leak, the closest thing to a stand-alone procedure is an attachment in the AOP for RCS leak (AOP-22). This attachment is used to shutdown the plant before the reactor is tripped; where as, EOP-04 is used after the reactor is tripped.

Justification for Distractors

A. Plausible, because 35 - 85% NR is the normal level band to be maintained post-trip in most instances, will inhibit AFW from automatically actuating (32% wide range) if maintained, and this is the correct reason; however, it is the wrong band. It is incorrect because the Steam Generator Tube Rupture procedure specifies 44 - 85%

B. Plausible, because it will inhibit AFW from automatically actuating (32% wide range) if maintained, but incorrect because it is the wrong band.

C. **This is the correct band and reason for the CRS direction. 26% narrow range is above the top of the U-tubes, 10% added for instrument inaccuracies, and 8% for margin. This ensures there is a scrubbing effect from the water in the steam generator to limit radioactivity release.**

D. Plausible, because it is the correct band to maintain in EOP-04; however it is the incorrect reason for this band.

References

EOP-04 Steam Generator Tube Rupture

Cog Level - Low

New

Validators LOD 2.5

Rev 1

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	000037 AK3.07	Bank Ref #:	
LP# / Objective:	7-18-14 01.01	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:		Handout:	

(22)QUESTION NUMBER: 022

Which of the following combinations of Condenser vacuum and Turbine load VIOLATES the operating instruction for the Turbine and requires an IMMEDIATE Reactor/Turbine Trip?

	Condenser Vacuum	Main Generator Load
A.	24.85"Hg	60 MW
B. ✔	23.85" Hg	140 MW
C.	22.85" Hg	175 MW
D.	21.85"Hg	200 MW

APE: 051 Loss of Condenser VacuumAA2. Ability to determine and interpret the following as they apply to the Loss of Condenser Vacuum:AA2.02 Conditions requiring reactor and/or turbine trip.

RO 3.9 10 CFR 55.(CFR: 43.5 / 45.13)

LP 7-17-26 EO 1.3 Describe the major recovery actions of this AOP.

Justification for Distractors

A. Plausible, because OP-4, Load Change and Normal Power Operation, Attachment 2, Power Reduction, directs the operator to go to OP-3A, Plant shutdown when at 15% power, where the turbine can be unloaded when reactor power is 10 - 12%, and then the reactor tripped at any point. However, this is not required. OP-3 has steps to shutdown the reactor in a controlled manner all the way to Mode 2. Therefore, this is incorrect.

B. **Correct, this condition requires tripping the plant to protect the turbine blades from overheating, because there is not enough steam flow (150 MW) at the saturation temperature of 23.85" Hg to adequately cool the blades.**

C. Plausible, because OP-4, Load Change and Normal Power Operation, Attachment 2, Power Reduction, has steps to trip the reactor at 35% power (175 MW), **if desired.** Therefore, this is not a **MUST** statement.

D. Plausible, because this vacuum is close to the automatic trip setpoint of 21.35" Hg and could be mis-judged by the applicant. However, it is incorrect (AOP-26 notes for setpoints.

References

OP-3, Plant Shutdown, Attachment 1, Plant Shutdown from Mode 1 to Mode 2.
OP-4, Load Change and Normal Power Operation, Attachment 2, Power Reduction.
AOP-26, Turbine Malfunctions, Attachment 1, Loss of Condenser Vacuum.

Cog Level - Low

1999 NRC Exam bank 7-17-26 #2

Validators LOD 3.0

Rev 1

KA#:	000051 AA2.02	Bank Ref #:	7-17-26 #2
LP# / Objective:	7-17-26 01.03	Exam Level:	RO
Cognitive Level:	HIGH	Source:	
Reference:		Handout:	

(23)QUESTION NUMBER: 023

AB Stack Process Radiation Monitor "Alert" setpoints are adjusted per the Offsite Dose Calculation Manual and are based on limits found in_____.

A. ✔ 10 CFR 20, "Standards for Protection Against Radiation."

B. 10 CFR 50.67, "Accident Source Term."

C. 10 CFR 100, "Reactor Site Criteria."

D. 40 CFR 190, "Environmental Protection Standards for Nuclear Power Operations."

APE: 060 Accidental Gaseous Radwaste Release AK1:Knowledge of the operational implications of the following concepts as they apply to Accidental Gaseous Radwaste Release: AK1.02 Biological effects on humans of the various types of radiation, exposure levels that are acceptable for personnel in a nuclear reactor power plant; the units used for radiation intensity measurements and for radiation exposure levels.

K/A fit: The alert setpoints are based on the 10 CFR 20 limits which minimize the dose and biological effects on humans from the radiation intensity during an accidental radwaste release.

RO 2.5 10 CFR 55.41 (b) (10) RO level because the question asks the applicant to identify which CFR standard is protected by the rad monitor alarms.

LP 7-12-03 EO 2.02 STATE the two alarm setpoints for most monitors and EXPLAIN what each setpoint designates.

Justification for Distractors

The alert setpoints are based on choice A. The other choices are plausible but incorrect, since they are based on off-site dose, but for different conditions.

References

STM 33 - Radiation Monitoring Systems

Cog Level - LOW memory

Bank Question 7-12-03 #56

Validators LOD 3.0

Rev 0

KA#:	000060 AK1.02	Bank Ref #:	7-12-03 #56
LP# / Objective:	7-12-0302.02	Exam Level:	RO
Cognitive Level:	LOW	Source:	BANK
Reference:	STM-33	Handout:	

(24) QUESTION NUMBER: 024

The plant was at 100% power with a normal electrical lineup, when the CRS entered AOP-06, Fire Emergency, Section II, Control Room Evacuation.

- The reactor has been tripped.
- Fast transfer has occurred.

Given the conditions listed above, which of the LO actions taken outside the control room are correctly paired with their impact on the plant?

	Action taken outside Control Room	Impact on the plant
A.	Placing 183 MES/D1, "MASTER EMERGENCY CONTROL SWITCH" in EMERGENCY at AI-133.	Starts Emergency Diesel Generator D-1
B.	Placing 183 MES/D2, "MASTER EMERGENCY CONTROL SWITCH" in EMERGENCY at AI-133.	Starts Emergency Diesel Generator D-2
C.	Placing the 69/1A13, "PERMISSIVE CONTROL SWITCH 1A13 BREAKER" in AFTER-TRIP and then in PULL-TO LOCK.	Starts Emergency Diesel Generator D-1
D. ✔	Placing the 69/1A44, "PERMISSIVE CONTROL SWITCH 1A44 BREAKER" in AFTER-TRIP and then in PULL-TO LOCK.	Starts Emergency Diesel Generator D-2

APE 067: Plant fire on site GENERIC 2.4.34 Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.

RO 4.2 10 CFR 55.41 (b) (10)

LP 7-13-05 EO 1.9 Explain an emergency start of the EDG. 1.9a The conditions that will cause an auto start.

Justification for Distractors

A. Plausible, because this is similar action that could be performed by LO1, although not directed in AOP-6, it would isolate D1 just the same as the 183 MES/D2 does for D2. It is incorrect, because it does not start the D1.

B. Plausible, because this is a step in AOP-06 that LO2 is directed to take prior to verifying D2 is running and placing this switch in EMERGENCY causes several actions. It is incorrect, because it does not start the D2

C. Plausible, because this action will isolate D1 from a potential power source, however, it is incorrect, because it is not the last power source and does not result in starting D1 on undervoltage. In the procedure, it is actually the step before the one that will start D1.

D. **This is the correct answer. This is the last power supply available to the bus and D2 will start on undervoltage on the bus.**

References

AOP-06 Fire Emergency, Attachment A, LO2 Actions After Control Room Evacuation.
AOP-06 Fire Emergency, Attachment C, LO1 Actions After Control Room Evacuation.
STM-EDG Volume 16 Emergency Diesel Generator System

Cog Level - High The applicant must know the action and the consequence of the action based on system knowledge since it is not stated in the procedures.

New

Validators LOD 3.5

Rev 2

KA#:	000067 2.4.34	Bank Ref #:	
LP# / Objective:	7-13-05 01/09	Exam Level:	RO
Cognitive Level:	LOW	Source:	
Reference:	AOP-06	Handout:	

(25) QUESTION NUMBER: 025

The plant is at 100% power. As a result of a common mode failure, both the Personnel Air Lock doors and Containment Equipment Hatch seals have been declared inoperable.

- Containment Pressure is 1.5 psig and rising.
- Containment Temperature is 110°F and rising.

The operator will **IMMEDIATELY** _____.

A. ✔ Allow power to coast down.

B. Ensure **BOTH** Containment Cooling and Filtering Units, VA-3A/B, are running.

C. Open LCV-218-3, charging Pump Suction SIRWT Isolation Valve and Close LCV-218-2, VCT Outlet Valve.

D. Initiate a Containment Pressure Reduction per OI-VA-1, Containment Heating, Cooling, and Ventilation System Normal Operation.

APE: 069 Loss of Containment Integrity AK2. Knowledge of the interrelations between the Loss of Containment Integrity and the following:AK2.03 Personnel access hatch and emergency access hatch.

RO 2.8 10 CFR 55.41 (b) (7)

LP 7-17-12 EO 1.3 Describe the major recovery actions of the AOP.
TS references

Justification for Distractors

Meets the K/A because question is asking about the the actions that must be taken for a loss of containment integrity, which occurs due to the loss of the seals. It is RO level because it is an immediate action.

A. **Correct answer, allowing power to coast down is a direct result of terminating any positive reactivity additions, water adds, which are done shiftly to compensate for fuel burnup.**

B. Plausible, because AOP-12 directs Containment Cooling to be maximized if temperature is greater than 120 degrees. It would also seem logical that running both Containment Cooling and Filtering Units, VA-3A/B, would help scrub containment atmosphere (using iodine and HEPA filters) and limit any radioactive release. It is incorrect, because temperature is below the required limit.

C. Plausible, because if Containment Integrity cannot be restored in one hour AOP-12 directs action be taken IAW AOP-05. However, it is incorrect, because this action is not required for an hour.

D. Plausible, because AOP-12, directs this action, but only if containment pressure is greater than 3 psig. Contaiment pressure normally rises due to inleakage from instrument air controllers. This is incorrect, because the limit of 3 psig has not been reached.

References

AOP-12, Loss of Containment Integrity.
AOP-05, Emergency Shutdown.

Cog Level - High Because the applicant must determine that a loss of the seals results in a loss of containment integrity, since the applicant is not told that in the stem.

Bank Question 7-17-12 #2

Validators LOD 2.5

Rev 1

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	000069 AK2.03	Bank Ref #:	7-17-12 #2
LP# / Objective:	7-17-12 01.03	Exam Level:	RO
Cognitive Level:	HIGH	Source:	
Reference:		Handout:	

(26) QUESTION NUMBER: 026

The CRS has entered AOP-21, Reactor Coolant System High Activity due to leaking fuel assemblies and directed the Reactor Operator to start a second charging pump and to balance charging and letdown flows.

Original conditions with **one charging pump & balanced letdown flow**:

- REGEN HT EXCH LTDN OUTLET TEMP TIC-202 223°F
- LETDOWN TEMP TIC-211 105°F
- RC MAKEUP WTR TEMP TI-237 400°F

New conditions with two **charging pumps & balanced letdown flow**:

- REGEN HT EXCH LTDN OUTLET TEMP TIC-202 235°F
- LETDOWN TEMP TIC-211 145°F
- RC MAKEUP WTR TEMP TI-237 430°F
- Annunciator LETDOWN HEAT EXCH TUBE OUTLET TEMP HI is lit.

1) What effect, if any, does the new set of conditions have on the RCS Activity?
2) What action can the Operator take now to help correct the situation?

	Effect on RCS Activity	Action for the Operator to take
A.✔	Rises	Raise CCW flow to the letdown heat exchanger
B.	Rises	Start a third charging pump
C.	**NO** change	Raise CCW flow to the letdown heat exchanger
D.	**NO** change	Go to RESET on the ION EXCHANGERS BYPASS VALVE TCV-211-2

APE 076: High Reactor Coolant Activity AA1. Ability to operate and / or monitor the following as they apply to the High Reactor Coolant Activity: AA1.03 CVCS letdown flow rate and temperature.

RO 2.3* 10 CFR 55.41 (b) (7) Although the K/A Importance for this is 2.3, at FCS it is much more important due to the potential for a positive reactivity addition if the CCW valves to the letdown heat exchanger were to fail open, the ion exchangers would go to a new boron saturation condition. In addition, the potential exists for channeling through the ion exchanger's resin bed if flow was allowed to rise too high.

LP 7-11-20 EO 3.4 Explain how RCS chemistry is affected by CVCS filters and ion exchangers.

Justification for Distractors

Meets the K/A because the question is asking how the ability to remove activity in the RCS changes due to temperature in the letdown system, which the RO monitors, and asks how to ooperate in order to correct the problem.

A. Correct, because the ion exhangers were automatically bypassed when letdown temperature reached 140°F activity will rise, and only lowering temperature will allow flow to be realigned to the ion exchangers.

B. Plausible, if RCS activity was rising it would be a good idea to start a third charging pump to increase cleanup; however, the activity is due to a crud burst and there is no further rise in activity like there would be for a fuel leak.

C. Plausible, the CCW temperature control valves for the letdown heat exchanger did not automatically adjust for increased letdown flow. Raising CCW flow through the heat exchanger will lower letdown temperature and allow the bypass valve to be reset. Incorrect, because without flow through the ion exchangers, the activity level will rise.

D. Plausible, because this is an action to take; however, it will not work until letdown temperature is below 140°F.

References

Cog Level - High Requires the applicant to know the setpoint for TCV-211-2 and its affect on purification in the RCS, the ion exchangers are bypassed. The applicant must also know the normal temperatures for the system at 100% power and the expected new temperatures for two charging pumps with balanced letdown.

New

Validators LOD 3.0

Rev 2

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	000076 AA1.03	Bank Ref #:	
LP# / Objective:	7-11-20 03.04	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:		Handout:	

(27) QUESTION NUMBER: 027

The Reactor has been tripped from 100% power due to the inability to maintain Pressurizer level, and the Standard Post Trip Actions have been completed.

The following conditions exist:

• Pressurizer Pressure	1850 psia lowering
• Pressurizer Level	15% lowering
• RCS Tcold	525°F lowering
• RM-053 CCW Process Radiation Monitor	$5x10^3$ cpm rising
• CCW SURGE TK AC-2 LEVEL LIC-2801	60% rising
• CCW SURGE TK AC-2 PRESSURE PIC-2802	45 psig rising
• CC WATER FROM RC-3A SEAL COOLER TEMP HI	annunciator lit
• CC WATER FROM RC-3A LUBE OIL COOLER TEMP HI	annunciator lit
• CC WATER SURGE TANK AC-2 HI OR LO LEVEL	annunciator lit

1) Which action below will limit the spread of contamination from the break outside the containment, and
2) Which of the following indications will confirm leakage from the containment has been isolated?

	1) Action to limit spread of contamination	2) Confirms leakage
A.	Close all of the RCP Coolers CCW Valves, HCV-438A/B/C/D	Reactor Coolant Drain Tank Level Rising
B. ✔	Close all of the RCP Coolers CCW Valves, HCV-438A/B/C/D	Containment Sump Level Rising
C.	Close **BOTH** TCV-202, Letdown Isolation Valve, and HCV-204 Letdown Isolation Valve	Reactor Coolant Drain Tank Level Rising
D.	Close **BOTH** TCV-202, Letdown Isolation Valve, and HCV-204 Letdown Isolation Valve	Containment Sump Level Rising

A16 Excess RCS Leakage AK2. Knowledge of the interrelations between the (Excess RCS Leakage) and the following:AK2.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

This question meets the K/A because it addresses the manual feature that is proceduralized to limit leakage outside containment and it asks the applicant to identify the instrumentation that will indicate that the leak has been confined to the containment.

RO 3.2 10 CFR 55.41 (b) (7) This is RO level because it deals with the mitigating strategy for an intersystem LOCA into the CCW system.

LP 7-18-13 EO 1.1Explain the major stategy used to mitigate the consequences of a

Justification for Distractors

Explanation: The procedure steps isolate CCW inside containment. The RCS leakage will eventually pressurize the CCW header in containment to >160# and the relief will lift directing leakage to the containment sump.

A. Plausible, because it is a step in the procedure to limit the spread of contamination outside containment; and the RCDT collects hydrogenated drains from closed systems in containment. However, it is incorrect because the relief valve relieves to the containment sump.

B. This is the correct answer, the HCV-438 valves are closed and leakage is directed to the containment sump.

C. Plausible, because this is a step taken in the procedure to limit the spread of contamination outside the containment; however, it is incorrect, because this step would not limit the spread of contamination due to this break condition. In addition, the leak is not in the LDHX due to the high temperature alarms associated with the RCP seal package, and leakage will not go to the RCDT.

D. Plausible, because leakage will go to the containment sump; but it is incorrect, because this step would not limit the spread of contamination due to this break condition.

References

TDB-EOP-03, LOCA

Cog Level - High The applicant must analyze a set of conditions and diagnose the leak location and that the HCV-438 valves will isolate the RCP seal leak from the CCW system outside containment. With the leak In this location, closing TCV-202 and HCV-204 will not limit the break flow spreading outside containment. In addition, the applicant must know that leakage from the relief valve will be directed to the containment sump.

New

Validators LOD 3.0

Rev 1

KA#:	CE-A16 AK2.01	Bank Ref #:	
LP# / Objective:	7-18-13 01.01	Exam Level:	RO
Cognitive Level:	HIGH	Source:	
Reference:	EOP-03	Handout:	

(28)QUESTION NUMBER: 028

A plant startup is in progress from Mode 5 to Mode 4. RCPs RC-3A, RC-3B, and RC-3C are running to raise RCS temperature.

The following indications are found on the ERF:

- RC-3A stator temperature 80°C stable
- RC-3A Motor thrust bearing temperature 150°F stable
- RC-3A Lower Oil Reservoir level 105% stable

- RC-3B stator temperature 90°C rising
- RC-3B Motor thrust bearing temperature 210°F stable
- RC-3B Upper Oil Reservoir level (actual) 81% stable

- RC-3C stator temperature 150°C stable
- RC-3C Motor thrust bearing temperature 170°F stable
- RC-3C Upper Oil Reservoir level (actual) 76% stable

What action, if any, must be taken?

A. Stop RC-3A

B. Stop RC-3B

C. ✔ Stop RC-3C

D. Continue to run all three RCPs.

003 Reactor Coolant Pump System (RCPS) A1 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPS controls including: A1.03 RCP motor stator winding temperatures.

RO 2.6 10 CFR 55.41 (b) (5)

LP 7-11-20 EO 1.7B List the general design parameters for a RCP.

Justification for Distractors

A. Plausible, because 105% level does not seem normal; however, this is incorrect , because the RCP lower oil reservoir indication goes past 100% and is normal below 110%. The other parameters are normal or high in range.

B. Plausible, because for RC-3A, C and D motor thrust bearing temperature greater than 203°F is trip criteria. However, this is incorrect, because RC-3B has a higher trip criteria of 230°F, because it is from a different manufacturer. The other parameters are normal or high in band.

C. **AOP-35, section III - High Stator Temperature requires stopping the RCP is temperature is not less than 120°C (Step 2.2 Contingency Action)**

D. Plausible, if the applicant did not recognize or know the correct criteria for stopping the RCPs. However; this is incorrect, because AOP-35 directs stopping the RC-3C given a Stator temperature of 125°C.

References
OI-RC-9, Reactor Coolant Pump Operation
AOP-35, Reactor Coolant Pump Malfunctions

Cog Level - Low The applicant must know all the different conditons for the parameters being monitored for stopping the RCPs, and comparing them to the criteria for stopping a pump and determine if the pump should continue to run or be stopped.

New

Validators LOD 3

Rev 2

KA#:	003000 A1.03	Bank Ref #:	
LP# / Objective:	7-11-20 01.07B	Exam Level:	RO
Cognitive Level:	HIGH	Source:	
Reference:	OI-RC-9	Handout:	

(29) QUESTION NUMBER: 029

The plant is at 100% power and the following conditions are present:

- CHARGING PUMPS MODE SELECT/STBY switch is in the CH-1B-1C position.
- CH-1A and CH-1B are running.
- Letdown is 76 gpm.
- Pressurizer Level is at setpoint.
- RCS temperature is constant.

How will Pressurizer Level respond if TCV-202, LTDN TO REGEN HT EXCH ISOLATION VALVE, fails closed with **NO** operator action?

A. ✔ Initially rise at 1.52 %/minute for 1.7 minutes, then rise at 0.7%/minute.

B. initially rise at 1.6%/minute for 1.6 minutes, then rise at 0.8%/minute.

C. initially rise at 1.52%/minute for 1.0 minutes, then rise at 0.7%/minute.

D. initially rise at 1.6%/minute for 1.1 minutes, then rise at 0.8%/minute.

004 Chemical and Volume Control System (CVCS) K3 Knowledge of the effect that a loss or malfunction of the CVCS will have on the following: K3.05 PZR LCS

RO 3.8 10 CFR 55.41 (b) (7)

LP 7-11-2 EO 1.3 Explain the automatic and manual controls associated with the charging pumps and boric acid pumps.

Justification for Distractors
The charging pump is rated at 40 gpm. There are 50 gallons/% level in the pressurizer, and 4 gpm reactor coolant pump bleedoff. With two charging pumps running, the always running pump and the first backup. The backup pump will be stopped by the pressurizer level control system at 2.6% (or 130 gallons) above setpoint.
130 gals/(80gals - 4gpm RCPBO) = 1.7 minutes. After the backup charging pump is stopped, level will rise at 50 gal/%/(40gal/minute - 4 gpm RCPBO) =).7.

A. **The charging pump is rated at 40 gpm. There are 50 gallons/% level in the pressurizer, and 4 gpm reactor coolant pump bleedoff. With two charging pumps running, the always running pump and the first backup. The backup pump will be stopped by the pressurizer level control system at 2.6% (or 130 gallons) above setpoint. 130 gals/(80gals - 4gpm RCPBO) = 1.71 minutes. After the backup charging pump is stopped, level will rise at 50 gal/%/(40gal/minute - 4 gpm RCPBO) = .72. the numbers have been rounded to 0.1.**

B. Plausible, if the applicant does not take RCPBO into consideration.

C. Plausible, if the applicant uses the setpoint of 1.7% for the second charging pump.

D. Plausible, if he applicant uses the setpoint of 1.7% and does not take RCPBO into consideration.

References

Lesson Plan 7-11-20 RCS

Cog Level - High

New

Validators LOD 3.5

Rev 1

KA#:	004000 K3.05	Bank Ref #:	
LP# / Objective:	07-11-2 01.03	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	LP 7-11-2	Handout:	

(30) QUESTION NUMBER: 030

Which of the following relationships correctly represents the effect of raising or lowering Hydrogen over pressure and its effect on the RCS stress corrosion rate and explains why the stress corrosion rate is affected?

	VCT H2 Pressure	Effect on stress corrosion rate, and reason
A.	Raising	lowers corrosion rate, because it lowers pH
B.	Lowering	raises corrosion rate, because it raises pH
C. ✔	Raising	lowers corrosion rate, because it lowers Oxygen concentration
D.	Lowering	raises corrosion rate, because it raises Oxygen concentration

004 Chemical and Volume Control System (CVCS) K5 Knowledge of the operational implications of the following concepts as they apply to the CVCS: K5.01 Importance of oxygen control in RCS.

RO 2.7 10 CFR55.41 (b) (5)

LP 7-11-20 EO 2.7 List the RCS chemistry specifications for oxygen and halogens during normal operation.

Justification for Distractors

This meets the K/A because it is asking about the implications of changing Oxygen levels as a result of changing Hydrogen over pressure in the VCT, and the effect on primary corrosion rates, and how this is controlled.

A. Plausible, because raising H2 overpressure lowers the general rate of corrosion, but has a small effect of raising pH, although it is negligable. Therefore, this is incorrect.

B. Plausible, because lowering H2 will raise corrosion rates, but it is incorrect because it does not raise pH.

C. **This is the correct answer, a H2 overpressure will lower corrosion rates.**

D. Plausible, because lowering overpressure in the VCT could allow ingress of Oxygen into the sysrtem. However, this is incorrect, because any overpressure will prevent atmospher ingress to the system.

References

T.S. 2.1.5 Maximum Reactor Coolant Oxygen and Halogen concentrations.

Cog Level - low

New

Validators LOD 2.0

Rev 1

KA#:	004000 K5.01	Bank Ref #:	
LP# / Objective:	7-11-20 02.07	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	TS 2.1.5	Handout:	

(31) QUESTION NUMBER: 031

The plant has been shutdown and cooled down for repairs to a leak on an ICI Greylock fitting. The following conditions exist:

• Pressurizer Pressure (at saturated conditions)	275 psia
• RCS Tcold	170°F
• RCPs RC-3A and RC-3B	Running
• Pressurizer Heaters Backup Banks 1, 2 and 3	Energized
• Pressurizer Heaters Backup Bank 4	De-energized
• Pressurizer Proportional Heaters Banks P1 and P2	Energized
• Pressurizer Spray Valves PCV-103-1 & 2	Open
• Shutdown Cooling Pump SI-1A, LPSI	Running @ 1500 gpm.
• Charging Pump CH-1A	Running

Prior to stopping the RCPs, which of the following:

1) Describes the action to be taken, and
2) Describes the consequence of NOT taking that action?

	Action to be taken	Consequence of NOT taking that action
A.	Energize Backup Heater Bank 4	A bubble will form in the Reactor Head
B.	Start a second LPSI pump to raise Shutdown Cooling Flow	A bubble will form in the Reactor Head
C.	Place HC-347/348, "PZR PRESS PC-118A AUTO SIG OVERRIDE" switch in "OVERRIDE".	Shutdown Cooling Suction Valves HCV-347 and HCV-348 go closed.
D. ✔	Ensure a charging pump is running, open an Auxiliary Spray valve, and close a charging loop isolation valve.	Shutdown Cooling Suction Valves HCV-347 and HCV-348 go closed.

005 Residual Heat Removal System (RHRS) A2 Ability to (a) predict the impacts of the following malfunctions or operations on the RHRS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A2.02 Pressure transient protection during cold shutdown.

RO 3.5 10 CFR 55. 41(b)(5)

This is RO level because it asks the applicant to predict consequences of mis-operation of a cooldown strategy based on facility operating characteristics. It is based on equipment and system operation and OE at FCS.

Lesson Plan 7-11-20 EO 3.6a Discuss the prerequisites and precautions for shutdown of the RCS.

Justification for Distractors

This question meets the K/A because is addresses the impact of an operation that occurred at FCS that resulted in a transient pressure spike, and asks the student to predict the consequences of that pressure spike/mis-operation and choose an action that can be taken to mitigate/prevent the consequences.

A. Plausible, because raising pressure in the pressurizer will prevent a bubble from forming in the reactor vessel head by raising saturation temperature in the Pressurizer; however, this is incorrect because the procedure directs being below 180°F to prevent a bubble from forming, and the plant is below this temperature.

B. Plausible, because a bubble forms due to lack of cooling flow into the head region and starting another LPSI pump would help raise flow into the head regio and helps to cool the head down. However,this is incorrect because the procedure directs being below 180°F to prevent a bubble from forming, and the plant is below this temperature.

C. Plausible, because securing the RCPs will cause a loss of spray flow, hence a loss of pressure control. With the heaters energized, pressure will rise until 300 psia and the SDC suction valves HCV-347/348 will go closed on a high pressure signal from PT-115 and PT-118. The pressure signal from PT-118 can be overridden with the switch; however, pressure must then be lowered below 300 psia to clear the signal from PT-115, since there is no override switch for that instrument.

D. This is the correct answer. This scenario occurred during the RFO in 2006. A CAUTION in OP-3A now directs the operator to initiate auxiliary spray flow before stopping the RCPs and warns of loss of pressure control if this is not done.

References

OP-3A Plant Shutdown

Cog Level - High

New

Validators LOD 3.0

Rev 1

KA#:	005000 A2.02	Bank Ref #:	
LP# / Objective:	7-11-20 03.06A	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	OP-3A	Handout:	

(32) QUESTION NUMBER: 032

The plant is at 100% power. Component Cooling Water (CCW) has been isolated from a High Pressure Safety Injection Pump (HPSI) to stop a CCW leak.

How would the HPSI pump's design function be affected in this condition for a Loss of Coolant Accident (LOCA)?

A. ✔ The pump's design function would NOT be affected.

B. The pump would begin to inject water from the SIRWT but FAIL within 8 hours.

C. The pump would inject from the SIRWT, begin to pump water from the containment sump during RAS but then FAIL within 8 hours.

D. The pump would inject from the SIRWT, pump water from the containment sump during RAS, but FAIL within 8 hours of initiating Hot Leg Injection.

006 Emergency Core Cooling System (ECCS) K6 Knowledge of the effect of a loss or malfunction on the following will have on the ECCS: K6.05 HPI/LPI cooling water.

K/A fit: this question asks the applicant to useHPSI system knowledge to determine how the pumps function is affected on the loss of CCW.

RO 3.0 10 CFR 55.41 (b) (7) RO level, because the applicant is asked for design basis system knowledge.

LP 7-11-22 EO 1.2 Explain the purpose of ECCS and each of he majorsubsystems and components, 1.2a High Pressure Safety Injection (HPSI)

Justification for Distractors

A. This is the correct answer IAW USAR.

B. Plausible, because TS does not address this issue and an applicant may assume failure with higher sump water temperature during recirculation. This is incorrect, because this condition is addressed in several procedures and the USAR.

C. Plausible, if the applicant does not realize that the temperature in the containment sump at the time of RAS is low enough to support recirculation without the pump failing. Incorrect, because this condition is addressed in several procedures and the USAR.

D. Plausible, if the applicant is not aware that the temperature of the water in this flowpath will be the same as from the sump.Incorrect, because this condition is addressed in several procedures and the USAR.

References

USAR 06-02 Engineered Safeguards Safety Injection System.
OI-CC-1 Component Cooling Water
OI-SC-1 Shutdown Cooling

Cog Level - LOW memory This is stated in procedure and USAR.

New

Validators LOD 3.0

Rev 0

KA#:	006000 K6.05	Bank Ref #:	
LP# / Objective:	7-11-22 01.02	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	IO-SC-1	Handout:	

(33)QUESTION NUMBER: 033

The plant is operating at 100% power. The following conditions exist:

- Containment Temperature 110°F stable
- Containment pressure 0.08 psig
- Containment Sump 5” stable
- Quench Tank Temp/Press/Level Rising
- PRESSURIZER PWR OPERATED RELIEF VALVE DISCH TEMP HI is lit.
- RC-142/PCV-102-1 VALVE FLOW is lit.
- PORV PCV-102-1-2 TIA-134 175°F rising
- Code Safety RC-141 TIA-135 125°F rising
- Code Safety RC-142 TIA-136 125°F rising
- Code Safety FI-142Acoustic Monitors NO lights lit
- PORV FI-102-1 Acoustic Monitors .25 light ON
- Code Safety FI-141Acoustic Monitors NO lights lit
- PORV FI-102-2 Acoustic Monitors NO lights lit

Leakage from which of the following is responsible for this set of conditions?

A. PORV PCV-102-1

B. PORV PCV-102-2

C. Safety Valve, RC-141

D. Safety Valve, RC-142

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

007 Pressurizer Relief Tank/Quench Tank System (PRTS) A4 Ability to manually operate and/or monitor in the control room:A4.10 Recognition of leaking PORV/code safety

RO 3.6 10CFR 55. 41 (b) (7)

Lesson Plan 7-11-20 EO Describe the design characteristics of each of the RCS instrumentation subsystems including type and relative location of each.

Justification for Distractors

This meets the K/A because it requires the student to interpret the control room indications and recognize which valve is leaking.

A. **This is the correct answer based on the annunciators in alarm and the acoustic monitior indication.**

B. Plausible, because the PORVs each share a common tailpipe temperature indicator and leakage from either will cause Quench Tank Temp/Press/Level to rise.

C. Plausible, because a code safety leaking will cause Quench Tank Temp/Press/Level to rise, and its tailpipe temperature indicator is rising.

D. Plausible, because a code safety leaking will cause Quench Tank Temp/Press/Level to rise, and its tailpipe temperature indicator is rising.

References

ARP-CB-1.2.3/A4 Window A-2
ARP-CB-1,2,3/A4 Window C-4
ATM-37 Reactor Coolant System

Cog Level - High Because it requires the student to interpret the control room indications and analyze which valve which valve is leaking.

New

Validators LOD

Rev 2

KA#:	007000 A4.10	Bank Ref #:	
LP# / Objective:	7-11-20 04.03	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	ARP-CB-123/A4	Handout:	

(34)QUESTION NUMBER: 034

With the plant at 100% power. The RO observes the following indications:

- PI-499 CCW PUMPS DISCHARGE HEADER PRESS 105 PSIG - steady
- T1-2800 CCW PUMPS DISCHARGE HEADER TEMP 65°F - steady
- RM-053 CCW Process Radiation Monitor 1300 cpm - steady
- LIC-2801 CCW SURGE TK AC-2 LEVEL 43.80" – rising
- LIC-2802 CCW SURGE TK AC-2 PRESS 41.50 psig – rising

Which of the following could cause this set of conditions?

A. A tube leak in A CCW/RW heat exchanger.

B. A tube leak in the Spent Fuel Pool Heat Exchanger.

C✔ Leakage through LCV-2801 CCW TNK LVL VALVE.

D. A tube leak in DW-46A, Deaerator Pump, Seal Water Cooler.

008 Component Cooling Water System (CCWS) K1 Knowledge of the physical connections and/or cause-effect relationships between the CCWS and the following systems:K1.05 Sources of makeup water.

Fits the K/A because it is asking the student to recognize the relationship between CCW and several systems supplied by CCW system and a system that supplies makeup water to CCW.

RO 3.3 10 CFR 55.41(b) (2) RO level because it is asking the student to analyze using indications available on the main control board and determine the cause-effect relationship of general design features of the systems under normal operating conditions.

LP 7-11-06 EO 6.1 Explain the conditions that indicate leakage in or out of the system.

Justification for Distractors

A. Plausible, because CCW flows on the shell side of the heat exchangers and typically the lower pressure fluid is on the shell side and the higher pressure fluid is on the tube side. However, the actual configuration is opposite, because of the sand in the RW system it is on the tube side where the higher velocity helps to minimize the accumulation of sand in the heat exchangers. A is incorrect, because CCW pressure is typically 90 - 100 psig and RW pressure is 40 psig; therefore, leakage would be from the CCW system into the RW system.

B. Plausible for the same reason as A, CCW on shell side and Spent Fuel Pool water on the tube side, to minimize the HX becoming a crud trap. However, it is incorrect, because the pressure on the spent fuel pool side normally runs less than CCW pressure.

C. This is the only correct answer, because of the supply pressure being at 70 psig and the CCW surge tank pressure being at a nominal 45 psig.

D. Plausible, because CCW supplies this heat exchanger, which is a non-radioactive source of water. However, it is incorrect because at only 10 psig, this system cannot leak into the CCW system.

References

STM - 27 Miscellaneous Plant Water Systems
STM - 44 Spent Fuel Pool Cooling System
lesson Plan 7-11-6 Component Cooling Water
OI-DW-4 Deaerated water System Normal Operation

Cog Level - High, because it is asking the student to analyze a set of indications and diagnose the cause of a condition using indications and system knowledge.

New

Validators LOD 3.0

Rev 1

KA#:	008000 K1.05	Bank Ref #:	
LP# / Objective:	7-11-06 06.01	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	OI-DW-4	Handout:	

(35) QUESTION NUMBER: 035

The plant is at 100% power, containment temperature and pressure are rising. The CRS directs that Containment Filtering and Cooling Unit fan VA-3A be started. The following lineup exists:

- HCV-497, CCW HX BYPASS valve is throttled.
- HCV-400B/D, "CNTMT CLG COIL VA-1A AC VLVS CONTROL SW" in "OPEN"
- HCV-400C, "CNTMT CLG COIL VA-1A OUTLT ISOL VLV CNTRLR" is closed.
- HCV-400A/C, CNTMT CLG COIL VA-1A ISOL VLVS CONTROL SW" in "CIRC".

Prior to starting VA-3A which of the following:

1) Describes the action to be taken, and
2) Describes the consequence of NOT taking that action?

	Action to be taken	Consequence of not taking action.
A.	Throttle closed HCV-497 CCW HX Bypass Valve.	Loss of CCW to RCP seals
B.	Throttle closed HCV-497 CCW HX Bypass Valve.	lifting CCW reliefs
C.	Throttle the CCW valve HCV-400C to maintain ≥70 psig CCW Discharge Header Pressure	Loss of CCW to RCP seals
D.✔	Throttle the CCW valve HCV-400C to maintain ≥70 psig CCW Discharge Header Pressure	lifting CCW reliefs

SYSTEM: 008 Component Cooling Water System (CCWS) A4 Ability to manually operate and/or monitor in the control room: A4.09 CCW temperature control valve.

Fits the K/A because it addresses the need to manually operate a throttle valve used for temperature control associated with the CCW system.

RO 3.0 10 CFR 55.41 (b) (7) RO level because the question is asking about design interlocks and the basis behind procedural steps, but not asking the applicant to remember the steps from memory.

LP 7-11-06 EO 1.2 Explain the operation of the controls associated with the CCW system valves operated from the control room.

Justification for Distractors

A. Plausible, because opening the HCV-400C valve will lower flow to other components, and closing HCV-497 valve will allow more flow to the heat exchangers and make up for lower flow to other components. This is incorrect, because the effect is minimal and will not result in lower flow to the point that the HCV-438 valves will close (<46 psig for 30 seconds with a CIAS present) and a CIAS is not present.

B. Plausible, because closing HCV-497 will allow more flow to the heat exchangers and result in more cooling for the system which would preclude a thermal relief from opening with a greater heat load. Incorrect, because HCV-497 is opened to bypass the CCW/RW heat exchangers and keep CCW temperature higher than it would be if flow went through all in-service heat exchangers. Therefore, not doing this will not cause thermal reliefs to lift, because the system capacity is capable of handling it.

C. Plausible, because not doing this action will have a small effect on CCW pressure to other components; however, it is incorrect, because a CIAS is not present, even if flow lowered to <46 psig.

D. **Correct answer: from the EOP attachment CI-11 "Running a fan for an extended period with the CCW isolated to the cooling coil can cause the water to heatup inside the coil and possibly lift or cause the reliefs to weep."**

References

EOP/AOP Attachment CI-11 Containment Cooling Operation
STM - CCW Volume 8 Component Cooling Water System

Cog Level -High The applicant must comprehend the results of not taking the prescribed action.

New

Validators LOD 3.0

Rev 2

KA#:	008000 A4.09	Bank Ref #:	
LP# / Objective:	7-11-06 01.02	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	EOP/AOP ATT CI-11	Handout:	

(36) QUESTION NUMBER: 036

The plant is at 100% power. The following conditions exist:

- PRESSURIZER PRESS CHAN SELECTOR SWITCH HC-103 is selected to CHAN X.
- PRESSURIZER PRESS CONTROLLER PC-103X is in Automatic.
- PRESSURIZER PRESS CONTROLLER PC-103X setpoint is 2100 psia.
- PROPORTIONAL HTRS BANKS P1 and P2 selected to AUTO.
- ERF Page PLI indicates Proportional Heaters at 100 KW.
- BACKUP HTRS BANKS 1 and 3 selected to ON.
- BACKUP HTRS BANKS 2 and 4 selected to AUTO.

Which of the following describes the response of the Pressurizer Pressure Control System if RCS Pressure transmitter PT-103X fails low with **NO** operator action?

A. All Heaters De-energize,
Spray Valves PCV-103-1 and -2 open, and
An RPS TM/LP trip occurs.

B. ✔ All heaters energize,
Spray Valves PCV-103-1 and -2 close, and
An RPS High Pressure trip occurs.

C. All Heaters energize,
Spray Valves PCV-103-1 and -2 open, and
RCS pressure stabilizes at a higher value.

D. Backup Heaters de-energize,
Spray Valves PCV-103-1 and -2 close, and
RCS pressure stabilizes at a lower value.

010 Pressurizer Pressure Control System K6 Knowledge of the effect of a loss or malfunction of the following will have on the PZR PCS: K6.03 PZR sprays and heaters.

K/A fit - This question presents the applicant with an equipment failure that results in the heaters failing on and the spray valves failing closed and asks for the student to diagnose the consequences this malfunction.

RO 3.2 10 CFR 55.41 (b) (7)

LP 7-11-20 EO 4.0 When given specific plant conditions, explain operating priciples to predict response of RCS instrumentation.

Justification for Distractors

A. Plausible, if the applicant assumes that failing low means off. This is incorrect, because the transmitter failing low will result in an error signal that turns on the heaters and closes the spray valves.

B. **This is the correct response because the transmitter failing low will result in an error signal that turns on the heaters and closes the spray valves, and without operator action, eventually, a high pressure trip will occur.**

C. Plausible, because the transmitter failing low will result in turning on the heaters and the applicant may believe the sprays will open in response to the heaters; thereby, reulting in a new higher pressurizer pressure. It is incorrect, because the same failure will keep the spray valves from opening.

D. Plausible, because the proportional heaters are controlled differently by SCRs rather than on-off like the backup heaters; and therefore, the applicant may believe that pressure may stabilize at a new lower value where the proportional heat output equals the constant minimum spray flow. Incorrect, because the pressure controller will affect all heaters.

References

STM-37 Reactor Coolant System

Cog Level - High The applicant must diagnose the consequences of the failure taking into account the control lineup for pressurizer pressure control system and system knowledge.

Bank Significantly modified 7-11-20 #120

Validators LOD 2.0

Rev 1

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	010000 K6.03	Bank Ref #:	7-11-20 120
LP# / Objective:	7-11-20 04.00	Exam Level:	RO
Cognitive Level:	HIGH	Source:	BANK
Reference:	STM-RCS	Handout:	

(37) QUESTION NUMBER: 037

The plant is at 100% power. The following conditions exist:

- CLUTCH POWER SUPPLY BREAKER RPS/CB-AB is closed.
- CLUTCH POWER SUPPLY BREAKER RPS/CB-CD is closed.
- CLUTCH POWER SUPPLY TRANSFER SWITCH RPS/TS-AB is in “BUS A AI-40A”
- CLUTCH POWER SUPPLY TRANSFER SWITCH RPS/TS-CD is in “BUS C AI-40C”
- 120 VAC Instrument Bus AI-40B is de-energized.
- RPS channels at AI-31B are in BYPASS.

Given the above conditions, which of the following describes the final condition of the plant if the CLUTCH POWER SUPPLY TRANSFER SWITCH RPS/TS-AB is placed in the “BUS B AI-40B” position?

A. No effect.

B. The reactor will trip.

C✔ The RPS is in a half trip condition.

D. Power to the CEA drive motors is de-energized.

012 Reactor Protection System K2 Knowledge of bus power supplies to the following: K2.01 RPS channels, components, and interconnections.

K/A fit because the question is asking about bus power supplies and how it interfaces/supplies the RPS channel and matrix power supply.

RO 3.3 10 CFR 55.41(b) (7) RO level because it is asking the applicant for system knowledge and diagnosing the end result of the condition.

LP 7-12-26 EO Describe the interface/interaction between the CRDS and the following systems/components: 1.2a Electrical Distribution System.

Justification for Distractors

A. Plausible, because with channel B is in bypass the applicant may think this is why the reactor does not trip. However, power to the logic matrix relays was lost when AI-40B was de-energized, and placing that channel in bypass puts the RPS in a 2/3 logic. This is incorrect, because the trip path supplying PS-1 and PS-3 are de-energized when the transfer switch is placed in AI-40B. Which puts the plant in a half-trip condition. No effect is not "none of the above" since the operator must understand that power will still come from the other side.

B. Plausible, because power is lost to a trip path which opens two sets of M contacts

and removes power from half the circuit. Incorrect, because power is still available from the other side (AI-40C).

C. Correct, because the trip path supplying PS-1 and PS-3 is de-energized when the transfer switch is placed in AI-40B. Which puts the plant in a half-trip condition. Two sets of M contacts will be open and two M coils de-energize and removes power from half the circuit.

D. Plausible, if the student confuses the power supply for the CEA drive motors with the CEA clutches. However, this is incorrect becaue they are separate power supplies.

References

STM-RP-Volume 37 Reactor Protective and Diverse SCRAM System

Cog Level - High Requires the student to use knowledge of the system and diagnose whether the plant will trip in this condition.

Significantly modified 7-12-26 #1

Validators LOD 3.0

Rev 1

KA#:	012000 K2.01	Bank Ref #:	7-12-26 #1
LP# / Objective:	7-112-26 01.02A	Exam Level:	RO
Cognitive Level:	HIGH	Source:	BANK 1995 NRC EXAM
Reference:	STM-38	Handout:	

(38)QUESTION NUMBER: 038

VAControl Room Ventilation System is operating in the following configuration:

- VA-46A, Control Room Air Conditioner, is in Auto and running
- VA-46B, Control Room Air Conditioner, is in Auto and off
- VA-63A,Control Room Emergency Air Supply Fan, is in Auto and off
- VA-63B, Control Room Emergency Air Supply Fan is in Auto and off

Counts on RM-051, CONTAINMENT/NOBLE GAS RADIATION MONITOR, and RM-052, CONTAINMENT/PARTICULATE RADIATION MONITOR are rising.

What will be the resulting configuration of the Control Room HVAC units (VA-46A/B) and Control Room Filter Units (VA-63A/B) if the countrates continue to rise above alarm setpoints?

A. VA-46A will continue to run
VA-46B will remain off
VA-63A **OR** VA-63B will start to provide filtered air makeup

B. ✔ VA-46A will continue to run
VA-46B will start
VA-63A **OR** VA-63B will start to provide filtered air makeup

C. VA-46A will continue to run
VA-46B will remain off
VA-63A **AND** VA-63B will start to provide filtered air makeup

D. VA-46A will continue to run
VA-46B will start
VA-63A **AND** VA-63B will start to provide filtered air makeup

013 Engineered Safety Features Actuation System (ESFAS)A1 Ability to predict and/or monitor changes in parameters (to Prevent exceeding design limits) associated with operating the ESFAS controls including: A1.07 Containment radiation.

K/A Fit: The ESFAS System realigns the Control Room HVAC following a CHRS due to rising countrates on RM-51 and RM-052 (which are monitoring containment atmosphere) resulting in a CRHS which actuates a VIAS putting the Control Room Ventilatin System in Filtered Air Makeup Mode to prevent exceeding dose limits in the Control Room.

RO 3.6 10 CFR 55.41 (b) (7) RO level because it is asking about the automatic function of a safety system that protects the operators in the control room.

LP 7-14-6 EO 1.8 Explain the principles of emergency operation of the Control Room Ventilation System in terms of flowpath, major parameters, alarms, and control devices.

Justification for Distractors

A. Plausible if the applicant does not know that both Control Room Air Conditioner units start if they are in AUTO, not just the one selected to Run, and it is true that the VA-63 Filter Unit associated with the running VA-46 unit will start. The opposite VA-63 unit will only start if the selected unit fails to start in 20 seconds. This is incorrect, because both Control Room Air Conditioner units get a start signal if they are in AUTO.

B. **This is the correct answer.**

C. Plausible, because VA-46A will continue to run. It is incorrect because VA-46B will start and both VA-63 units do not start.

D. Plausible, because VA-46A and B get a start signal, it is incorrect because both filter units do not start unless the selected one fails to start in 20 seconds from receiving a signal.

References

OI-VA-3, Control Room Ventilation

Cog Level - High Given a set of conditons the applicant must use system knowledge to analyize which units will start under these conditions.

New

Validators LOD 2.5

Rev 1

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	013000 A1.07	Bank Ref #:	
LP# / Objective:	7-14-6 01.08	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	OI-VA-3	Handout:	

(39)QUESTION NUMBER: 039

The plant tripped from 100% power. The following conditions are present:

- Reactor Coolant System Pressure 1250 psia lowering
- Containment Pressure 15 psig and rising
- Containment Area Radiation monitors rising trends
- All systems have operated as designed

Which of the following describes how the containment cooling systems will respond if CNTMT VA-1A COOLING COIL CCW OUTLET FLOW TRANSMITTER FT-416 fails low?

A. ✔ VA-3A CONTAINMENT AIR RECIR FAN continues to run.
HCV-400A CNTMT VA-1A COOLING COIL CCW INLET VALVE will close.
HCV-400C CNTMT VA-1A COOLING COIL CCW OUTLET VALVE will close.

B. VA-3A CONTAINMENT AIR RECIR FAN trips.
HCV-400A CNTMT VA-1A COOLING COIL CCW INLET VALVE will close.
HCV-400C CNTMT VA-1A COOLING COIL CCW OUTLET VALVE will close.

C. VA-3A CONTAINMENT AIR RECIR FAN continues to run.
HCV-400B CNTMT VA-1A COOLING COIL CCW INLET VALVE will close.
HCV-400D CNTMT COOLING COIL VA-1A RETURN ISOLATION VALVE will close.

D. VA-3A CONTAINMENT AIR RECIR FAN trips.
HCV-400B CNTMT VA-1A COOLING COIL CCW INLET VALVE will close.
HCV-400D CNTMT COOLING COIL VA-1A RETURN ISOLATION VALVE will close.

022 Containment Cooling System (CCS) K4 Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following: K4.03 Automatic containment isolation.

K/A fit; the question asks how the plant responds to a containment isolation signal and an interlock associated with it.

RO 3.6 10 CFR 55.41(b) (7) RO level because it is asking a design feature of the plant.

LP 7-11-6 EO 1.05 Explain the response of the CCW system to signals from the Engineered Safeguards Control System.

Justification for Distractors

A. **This is the correct answer. The valves will not go closed unless the low flow**

condition exists for greater than 25 - 30 seconds if a CIAS is present. The time delay allows for system realignment and CCW pumps to start on sequences during an accident.

B. Plausible, because a procedural caution states that a fan should not be operated with the cooler isolated; therefore, it would seem to be a good idea to trip the fan if the isolation valves close. However, in an accident condition it is important to keep the fan running to move air through the HEPA and Charcoal filter. This is not correct, because there is no contact to trip the fan.

C. Plausible, because these valves are also capable of isolating flow to the containment cooler and the D valve is referred to as a RETURN ISOLATION VALVE, which sounds like it would serve for containment isolation during an accident conditon. Not correct, because there are no contacts to close these valves on a low flow condition, and the fan continues to run.

D. Plausible because, these valves will receive a CIAS, but these valves open on CIAS, and they are also capable of isolating flow to the containment cooler and the D valve is referred to as a RETURN ISOLATION VALVE, which sounds like it would serve for containment isolation during an accident conditon. Incorrect, because these valves do not get the signal for closure on low flow, and the fan does not trip.

References

STM-CCW-Volume 8 Component Cooling Water.

Cog Level - High Applicant is being asked to analyze system response to a failure in an abnormal condition.

New

Validators LOD 3.0

Rev 1

KA#:	022000 K4.03	Bank Ref #:	
LP# / Objective:	7-11-06 01.05	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	STM-CCW	Handout:	

(40) QUESTION NUMBER: 040

The plant is at 100% power in a normal lineup. The following conditions are present:

- VA-3A, CNTMT VENT FAN — Running
- VA-1A Cooling Coil Isolation Valves HCV-400A/B/C/D — Open
- VA-3B, CNTMT VENT FAN — Stopped
- VA-1B Cooling Coil Isolation Valves HCV-401A/B/C/D — Closed
- VA-12A, DETECTOR WELL FAN — Running
- VA-12B, DETECTOR WELL FAN — Stopped
- VA-14A/B, DET WELL CLRS isolation valves HCV-467A/B/C/D — Open
- VA-14A, DET WELL CLR control valves HCV-468A/B — Open

How will an inadvertent actuation of the 86A/PPLS relay affect the position of the component cooling water valves for these systems?

A. VA-1A CCW isolation valves HCV-400A/B/C/D — Open
VA-1B CCW isolation valves HCV-401A/B/C/D — Open
VA-14A/B DET WELL CLRS isolation valves HCV-467 A/B/C/D — Open
VA-14A, DET WELL CLR control valves HCV-468A/B — Open

B. VA-1A CCW isolation valves HCV-400A/B/C/D — Open
VA-1B CCW isolation valves HCV-401A/B/C/D — Closed
VA-14A/B DET WELL CLRS isolation valves HCV-467 A/B/C/D — Open
VA-14A, DET WELL CLR control valves HCV-468A/B — Closed

C✔ VA-1A CCW isolation valves HCV-400A/B/C/D — Open
VA-1B CCW isolation valves HCV-401A/B/C/D — Open
VA-14A/B DET WELL CLRS isolation valves HCV-467 A/B/C/D — Closed
VA-14A, DET WELL CLR control valves HCV-468A/B — Open

D. VA-1A CCW isolation valves HCV-400A/B/C/D — Open
VA-1B CCW isolation valves HCV-401A/B/C/D — Closed
VA-14A/B DET WELL CLRS isolation valves HCV-467 A/B/C/D — Closed
VA-14A, DET WELL CLR control valves HCV-468A/B — Closed

SYSTEM: 022 Containment Cooling System (CCS) A2 Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A2.04 Loss of service water

K/A fit: The question is asking about the response of the CCS system in a given configuration to a containment isolation signal.

RO 2.9 10 CFR 55.41(b) (7) RO leve because the question is asking about component response to a failure mode in the system.

LP 7-11-6 EO 1.5 Explain the response of the CCW system to signals from the Engineered Safegards System.

Justification for Distractors

A. Plausible, the Containment cooling valves get an open signal and the applicant may assume that concrete cooling and detector well cooling is still important. However, this is incorrect, because the HCV-467 valves go closed on CIAS, to direct CCW to the VA-1A/B units and with the reactor shutdown, a large heat source in the NDW region has been removed.

B. Plausible if the applicant assumes only the non-vital loads are affected, and there is no change in the vital loads due to the non-running VA-3A fan. Incorrect, because an inadvertant PPLS in a normal lineup will actuate both trains (A/B) of CIAS and the HCV-401 valves will reposition regardless of whether VA-3A is running or not.

C. This is the correct answer. The NDWC system isolation valves go closed to direct water to the ultimate heat sink for containment VA-3A/B units. Only the HCV-467 valves go closed on a CIAS, signal. The HCV-468 valves do not get a signal from CIAS. In addition, the HCV-400/401 valves get an open signal on CIAS which is opposite from what might think.

D. Plausible, for the same reason as B, only the applicant would pick this choice is they did not know the HCV-468 valves do not get a signal, and the HCV-401 valves do not open because VA-3B is stopped. Incorrect, as stated in A andB above.

References

STM - CCW Volume 8 Component Cooling Water
STM - CV Volume 10 Containment Structure and Ventilation System

Cog Level - High The question is asking the applicant to interpret the plant response in a givenset of conditions and analyze the response of the containment cooling systems to an inadvertant CIAS.

New

Validators LOD 3.0

Rev 2

KA#:	022000 A2.04	Bank Ref #:	
LP# / Objective:	7-11-6 01.05	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	STM-CCW	Handout:	

(41) QUESTION NUMBER: 041

The plant tripped from 100% power due to inability to maintain RCS pressure. The following conditions exist:

• RCS Pressure	700 psia lowering
• Containment Pressure	8 psig lowering
• Steam Generator Pressures	720 psia lowering
• SIRWT TANK LEVEL LI-381	14” rising
• SIRWT TANK LEVEL LI-382	15” rising
• HPSI PUMP SI-2A	running
• HPSI PUMP SI-2B	running
• VA-3A CNTMT VENT FAN	running
• VA-7C CNTMT VENT FAN	running
• SIRWT TANK RECIRCULATION VALVE HCV-385	OPEN
• SIRWT TANK RECIRCULATION VALVE HCV-386	OPEN
• SIRWT HDR NO.2 SIRWT SUCTION VALVE LCV-383-1	CLOSED
• SIRWT HDR NO.1 SIRWT SUCTION VALVE LCV-383-2	CLOSED
• SIRWT HDR NO.1 CNTMT SUCTION VALVE HCV-383-3	OPEN
• SIRWT HDR NO.2 CNTMT SUCTION VALVE HCV-383-4	OPEN

Which of the following statements is true?

A. All systems are operating as designed.

B. ✔ Action must be taken to isolate a radiation release path.

C. Action must be taken to start more Containment Cooling Fans.

D. Action must be taken to align cooled Containment Spray water to the suction of a HPSI pump.

026 Containment Spray System (CSS) K4 Knowledge of CSS design feature(s) and/or interlock(s) which provide for the following:K4.09 Prevention of path for escape of radioactivity from containment to the outside (interlock on RWST isolation after swapover).

K/A fit: With HCV-385 and HCV-386 open, potentially contaminated water will be pumped from the containment sump to the SIRWT which is vented to the auxiliary building atmosphere providing a release path.

RO 3.7 10 CFR 55.41(b) (7) RO level because it is asking the applicant to determine if the equipment has operated properly, and if not, what mitigating action should be taken and to stop the release path.

LP 7-11-22 EO 1.8c. Explain the overall system response to actuation of engineered safeguards signals, Recirculation Actuation Signal (RAS).

Justification for Distractors

A. Plausible, because only the HPSI pumps are running and LPSI pumps have stopped and the HPSI pumps have a suction path. Incorrect, because a release path exists.

B. **This is the correct answer, because there is a release path with HCV-385/6 open and SIRWT level is rising as a result.**

C. Plausible, because all the containment cooling fans are not running and containment pressure is greater than 5 psig. However; this is incorrect, because VA-3B and VA-7/D could be started, but are not necessary for this condition to meet EOP-03 for heat removal. Incorrect, because the release path exists.

D. Plausible, because this would be done for cooled SI flow with RAS present; however, this is incorrect, because SDC entry conditions are not met. In addition, the release path still exits.

References
TDB-EOP-03 LOCA

Cog Level - High the applicant must analyze a set of conditions and diagnose the results of an abnormal line up and determine the consequences.

Previous NRC exam. modified

Validators LOD 3.0

Rev 2

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	026000 K4.09	Bank Ref #:	07-11-22 059
LP# / Objective:	07-11-22 01.08C	Exam Level:	RO
Cognitive Level:	HIGH	Source:	2007 NRC EXAM
Reference:	TDB-EOP-03	Handout:	

(42)QUESTION NUMBER: 042

During the performance of Attachment HR-29, Cooled SI Flow With RAS, how can the operator verify that Component Cooling Water in this lineup is removing decay heat from the Containment Spray flow as it goes through the Shutdown Cooling Heat Exchangers?

A. LPSI SHTDN CLG FLOW CONTROLLER FCV-326, indicates flow.

B. ✔ T339, and T340 HX EXCH AC-4A/B OUTLT TEMPs indicates a LOWERING TREND

C. TR-346, Shutdown Cooling Inlet/Outlet Temp Recorder indicates a LOWERING TREND on the Red Pen (OUTLET TEMP).

D. TR-346, Shutdown Cooling Inlet/Outlet Temp Recorder indicates a LOWERING TREND on the Black Pen (LPSI SUCT TEMP).

SYSTEM: 026 Containment Spray System (CSS) A3 Ability to monitor automatic operation of the CSS, including: A3.02 Verification that cooling water is supplied to the containment spray heat exchanger.

K/A fit: Meets KA because the question is asking how to determine the lineup is correct by verifying on the correct indications that the SDC heat exchanger outlet temperature is rising, indicating that decay heat is being removed.

RO 3.9 10 CFR 55.41 (b) (7) RO level, because this question requires knowledge of facility and component operating characteristics, and how to monitor the removal of decay heat in this alignment.

LP 7-18-13 EO 2.5Given a copy of attachment 29 explain the steps necessary to establish Cooled Safety Injection Flow with RAS.

Justification for Distractors

A. Plausible, because normal shutdown cooling flow monitored on FCV-326. This is incorrect, because flow does not go through this instrument with this lineup.

B. This is the correct answer. A verification step was added to the lineup for shutdown cooling OI-SC-1 that is also appropriate in this condition and lineup.

C. Plausible, because this is the method of verifying cooling is taking place in the heat exchanger during normal SDC. It is incorrect, because flow does not go through this instrument in this lineup. There are two pens on TR-346 the red pen monitors temperature on the outlet of the heat exchangers going back to the RCS.

D. Plausible, because this is the method of verifying cooling is taking place in the core during normal SDC. It is incorrect, because flow does not go through this instrument in this lineup. There are two pens on TR-346 the black pen monitors temperature on

the suction of the LPSI pumps and the containment spray pumps do not take a suction from this location.

References

OI-SC-1 Attachment 1, Initiation of Shutdown Cooling
STM-CCW Volume 8 Component Cooling Water
STM-ECC Volume 15 Emergency Core Cooling Water

Cog Level - High The applicant must use system and procedural knowledge to determine how the effect of cooling CCW flow will be verified. The applicant also needs to remember that the containment coolers are still removing decay heat in this condition.

New

Validators LOD 3.0

Rev 0

KA#:	026000 A3.02	Bank Ref #:	
LP# / Objective:	7--18-13 02.05	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	OI-SC-1	Handout:	

(43) QUESTION NUMBER: 043

The plant tripped from 100% power due to a loss of all off-site power. Subsequently, System Operations restored 161 KV.

- Power has just been restored to Non-Vital Bus 1A1.
- The CRS has directed that Condensate Pump FW-2A be started.

What is the primary reason for restarting Condensate Pump FW-2A in this condition?

A. To provide condensate flow to the Chemical Addition Tanks for chemistry control.

B. ✔ Raise Condensate pressure above saturation pressure in the feedwater heaters to minimize water hammer.

C. To provide a source of makeup water to the Condenser Evacuation Pumps Separator Tanks to re-establish vacuum.

D. Raise Condensate pressure high enough to provide a source of makeup water to the Emergency Feedwater Storage Tank in room 81.

039 Main and Reheat Steam System K5 Knowledge of the operational implications of the following concepts as the apply to the MRSS: K5.01 Definition and causes of steam/water hammer.

K/A fit: The main steam system provides steam to the turbine, and extraction steam from the turbine provides heat to the feedwater heaters. This heat is trapped in the feedwater heaters when the turbine is tripped. Without a source to pressurize the condensate system, this heat causes flashing of the condensate and subsequent water hammer as it condenses in cooler sections of the piping.

RO 2.9 10 CFR 55.41 (b) (5) RO level, because this question address facility operating characteristics in the secondary system following a trip (transient).

LP 7-18-12 EO 1.0 Demonstrate the knowledge required to use EOP-02 to mitigate the consequences of an electrical emergency or loss of forced circulation.

Justification for Distractors

A. Plausible, because this is done during normal operation and is how chemicals are added to the secondary system. This is incorrect, chemistry will become a concern for startup later,the most urgent need is to stop the water hammer in the secondary.

B. This is the correct answer IAW the step basis in EOP-02.

C. Plausible, because this is done during normal operation. Incorrect, because demineralized water is used for startup of the condenser evacuation pumps and then switched over to condesate once the system is established.

D. Plausible, because condensate is a source of makeup to the emergency feedwater storage tank, although not the preferred source because of the chemicals in the condensate. Incorrect, because demineralized water is the preferred source, and condensate would only be used if demineralized water is unavailable. With power restored, demineralized water is available.

References

TBD-EOP-02 Loss of Off-site Power/Loss of Forced Circulation
STM-CF-Volume 20 Feedwater and Condensate

Cog Level - Low this is memory, a stated reason in the TBD for EOP-02.

New

Validators LOD 2.5

Rev 0

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	039000 K5.01	Bank Ref #:	
LP# / Objective:	7-18-12 01.00	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	TDB-EOP-02	Handout:	

(44) QUESTION NUMBER: 044

A plant startup is in progress with the plant at 60% power and the Feedwater Regulating System in 3-element Automatic.

How do 1) steam generator level, and 2) the feedwater regulating valves, respond if the operator raises load 10% on the turbine?

	Steam generator level	Feedwater Regulating valves
A.	lowers	closes
B.	lowers	opens
C.	rises	closes
D. ✔	rises	opens

059 Main Feedwater (MFW) System K4 Knowledge of MFW design feature(s) and/or interlock(s) which provide for the following: K4.08 Feedwater regulatory valve operation (on basis of steam flow, feed flow mismatch)

K/A fit: The question asks the applicant to determine the response of the feedwater regulating valves to a steam flow rise with feedwater initially at a lower level.

RO 2.5 10 CFR 55.41(b) (7) Question asks about design features and how the system responds in automatic mode.

LP 7-11-11 EO 2.3 Explain the automatic features and interlocks of the feedwater components.

Justification for Distractors

A. Plausible, because inventory is reduced when the steam flow is raised. Incorrect, because the system is flow dominant and will open the feed reg valves, and level "swell" is observed when steam flow is raised.

B. Plausible, because inventory is reduced when the steam flow is raised and with a flow dominant system the feed reg valve would open. Incorrect, because level "swell" is observed when steam flow is raised.

C. Plausible, because level "swell" is observed when steam flow is raised. Incorrect, because the system is flow dominant not level dominant.

D. Correct, level "swell" is observed when steam flow is raised and in a level dominant system the feed reg valve opens.

References

STM-CF-Volume 20 Feedwater and Condensate System

Cog Level - Low

New

Validators LOD 2.0

Rev 0

KA#:	059000 K4.08	Bank Ref #:	
LP# / Objective:	7-11-11 02.03	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	STM-CF	Handout:	

(45) QUESTION NUMBER: 045

Which one of the following Main or Auxiliary feedwater pumps will be unavailable with a fault on bus 1A3?

A. Main FW Pump, FW-4A

B. Main FW Pump, FW-4B

C. ✔ Aux FW Pump, FW-6

D. Aux FW Pump, FW-10

061 Auxiliary / Emergency Feedwater (AFW) System K2 Knowledge of bus power supplies to the following:K2.02 AFW electric drive pumps

K/A fit: Question asks how a loss of a 4160 VAC bus affects the AFW motor driven pump.

RO 3.7 10 CFR 55.41 (b) (7) RO level since it asks a design feature of the plant.

LP 7-11-1 EO 1.6 State the normal and alternate power supplies for each major component for the AFW system.

Justification for Distractors

A. Plausible because it could be powered from any 4160V bus, However, FW-4A is powered from Bus 1A1

B. Plausible because it could be powered from any 4160V bus, However, FW-4B is powered from Bus 1A2

C. **Correct FW-6 is directly powered from 4160 V bus 1A3**

D. Plausible if applicant does not understand that FW-10 is the turbine driven AFW pump, however, it also becomes inoperable if 4160 Bus 1A4 is not energized, because power will not be available to the Battery Charger for DC Bus 2, which supplies the solenoid for the steam admission valve to FW-10. Incorrect, because it is powered from the 1A4 side.

References

STM-AFW-Volume 4 Auxiliary Feedwater System

Cog Level - Low

New

Validators LOD 2.0

Rev 1

KA#:	061000 K2.02	Bank Ref #:	
LP# / Objective:	7-11-01 01.06	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	STM-AFW	Handout:	

(46) QUESTION NUMBER: 046

The plant has experienced a station blackout (SBO).

What is the maximum time the station batteries are designed to maintain design voltage to DC Bus 1 and 2 in this condition?

A. 4 hours with no operator action.

B. ✔ 4 hours if non-essential DC loads are removed.

C. 8 hours with no operator action.

D. 8 hours if non-essential DC loads are removed.

062 A.C. Electrical Distribution K3 Knowledge of the effect that a loss or malfunction of the ac distribution system will have on the following:K3.03 DC system.

K/A fit: The question asks the applicant's knowledge of the effect on the DC system when the AC component (charger) has been lost in a SBO.

RO 3.7 10 CFR 55.41 (b) (8) The question asks the applicant's knowledge of the Componet's design and capacity.

LP 7-13-4 EO 1.2 Explain the operation of each major component during all modes of operation.

Justification for Distractors

A. Plausible if the applicant does not remember that the DC load must be minimized.

B. Correct answer IAW USAR 8.4.2.1

C. Plausible if the applicant associates the maximum time with a DBA, and does not realize that loads must be minimized and it is different for a SBO.

D. Plausible if the applicant associates the maximum time with a DBA, and knows that loads must be minimized, but it is incorrect, because it is different for a SBO.

References

USAR 8.4.2.1

Cog Level - LOW

New

Validators LOD 5.0 Validators were not aware of this design basis, the ILC has been taught this.

Rev 0

KA#:	062000 K3.03	Bank Ref #:	
LP# / Objective:	7-13-94 01.02	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	USAR 8.4.2.1	Handout:	

(47) QUESTION NUMBER: 047

Battery Charger 1, EE-8C, is faulted and has been removed from service. Battery1, EE-8A, is supplying Battery Bus AI-41A.

Assuming the DC loads remain constant, the battery voltage will _____.

A. Lower at a linear rate until fully discharged.

B. ✔ Initial short rapid drop, then remain stable, and drops rapidly at end.

C. Remain stable until close to full discharge, then drop rapidly.

D. Initial short rapid drop off and then lower at a linear rate.

063 D.C. Electrical Distribution A1 Ability to predict and/or monitor changes in parameters associated with operating the DC electrical system controls including: A1.01 Battery capacity as it is affected by discharge rate.

K/A fit: At FCS DC loads are minimized to extend the life of the DC battery. Since FCS does not have a meter to monitor Battery capacity or discharge rate, manual operator actions are taken to extend the time the battery can provide output.

RO 2.5 10 CFR 55.41(b) (5) RO level because it address a facility operating characteristic the RO is responsible for.

LP 7-13-4 eo 1.2 Explain the operation of each major component during all modes of operation.

Justification for Distractors

A. Plausible, since discharge rate is constant. Incorrect, because this is not a characteristic of a lead acid battery.

B. **Correct, this is the characteristic of a lead acid battery.**

C. Plausible, because battery voltage will stabilize until close to the end. Incorrect because there is an initial short quick drop.

D. Plausible, it does lower rapidly at first. Incorrect, it does not lower linearly with time.

References

Power Stream Chapter 5

Cog Level - LOW memory of power supply.

Validators LOD 2

Rev 0

KA#:	063000 A1.01	Bank Ref #:	
LP# / Objective:	7-12-26 01.02A	Exam Level:	RO
Cognitive Level:	LOW	Source:	BANK
Reference:	STM CRDS	Handout:	

(48) QUESTION NUMBER: 048

A Design Basis Accident has occurred.

Which of the following electrical power supply line-ups represent the MINIMUM necessary to mitigate this event using the Optimal Recovery Procedure?

A. ✔ One emergency diesel generator supplying its corresponding vital bus.

B. Both emergency diesel generators each supplying their respective vital buses.

C. One emergency diesel generator supplying its corresponding vital bus, and 161 KV supplying the other vital 4160 VAC bus.

D. Both emergency diesel generators each supplying their respective vital bus, and 161 KV supplying either Non-vital bus.

064 Emergency Diesel Generators (ED/G) 2.4.6 Knowledge of EOP mitigation strategies.

K/A fit: The design strategy to mitigate a DBA requires only one EDG and its associated bus as identified in the USAR and EOPs.

RO 3.7 10 CFR 55.41(b)(10) RO level, this addresses the bases for DBA EOP mitigation strategy.

LP 7-18-13 EO 1.7 Given a copy of the SFSC and a set of plant conditions, determine whether or not each safety function meets the acceptance criteria.

Justification for Distractors

A. This is the correct answer IAW USAR. Only one EDG is needed.

B. Plausible if the applicant does not know the DBA requirements and believes both EDGs and 4160 VAC buses are necessary, since both will start on safeguards signal. In addition, it is plausible because two HPSI pumps are required for HR-4, Once Through Cooling. This is incorrect because it is not the DBA.

C. Plausible, since the design basis assumes one EDG does not start (single failure criteria. In addition, it is plausible because two HPSI pumps are required for HR-4, Once Through Cooling. This is incorrect because it is not the DBA.

D. Plausible since a non-vital bus is necessary to start a condensate pump to minimize water hammer in the secondary. This is correct, but not necessary to mitigate the DBA.

References

USAR Section 8-04 Emergency Power Systems
EOP-03 LOCA
TBD-EOP-20 Functional Recovery Procedure

Cog Level - Low Memory

New

Validators LOD 2.0

Rev 0

KA#:	064000 2.4.06	Bank Ref #:	
LP# / Objective:	7-18-13 01.07	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	EOP-03	Handout:	

(49) QUESTION NUMBER: 049

Which of the following would result in automatically starting RM-065, the Control Room Iodine Monitor?

A. RM-050 CNTMT PARTICULATE HIGH RADIATION.

B. RM-057 CONDENSER OFF GAS HIGH RADIATON.

C. ✔ RM-062 AUX BLDG VENT STACK HIGH RADITION.

D. RM-089 AUX BLDG LEVEL 1036 HIGH RADITION.
Control Room Area Monitor.

073 Process Radiation Monitoring (PRM) System K1 Knowledge of the physical connections and/or cause effect relationships between the PRM system and the following systems: K1.01 Those systems served by PRMs.

K/A fit: Meets the KA because it is asking the applicant to know the relationship between the PRMs that cause a CRHS and subsequently a VIAS and what other PRM systems are affected.

RO 3.6 10 CFR 55.41 (b) (11) Ro level because it is asking system level knowledge of the PRM system.

LP 7-12-03 EO 4.1 List the radiation monitors with automatic actuations and state the automatic actions that occur.

Justification for Distractors

A. Plausible, because this is the containment particulate PRM and is in-line with RM-051 which monitors containment gas. This is incorrect, because it does not cause a CRHS (and subsequently, a VIAS).

B. Plausible, because high off-gas is an idication of a contaminated secondary system and it may be prudent to expect this alarm to turn on the control room iodine monitor for a primary to seconday leak, and there are automatic actions with RM-057. Incorrect, because this alarm does not result in a CRHS.

C. **This is the correct answer IAW TDB references.**

D. Plausible, because this is the control room area monitor and the applicant may assume it would be prudent to have the control room iodine PRM start on high area radioactivity. Incorrect, because there are no automatic actions associated with this monitor.

References

Annunciator Response Procedure ARP-AI-33C/A33C
TDB-VI.7 Process Monitor Setpoints
TDB-VI.8 Area Monitor Setpoints

Cog Level - Low the applicant must use system knowledge to relate that CRHS causes VIAS and that RM-065 starts on VIAS.

Bank - modified

Validators LOD 2.0

Rev 1

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	073000 K1.01	Bank Ref #:	
LP# / Objective:	07-12-03 04.01	Exam Level:	RO
Cognitive Level:	HIGH	Source:	BANK
Reference:	ARP-AI-33C	Handout:	

(50) QUESTION NUMBER: 050

Monitor Tank WD-22A is being released in accordance with FC-211, Waste Liquid Release Tank Permit.

- MONITOR TANK, WD-22A is at 60% level and lowering.
- MONITOR TANK DISCH PUMP WD-23A is running.
- HIGH FLOW CONTROL VALVE, HCV-692, is open.
- OVERBD DISCH HDER RECORDER, FR-690, is ON.

1) What is the impact on this lineup if: RM-055, OVERBOARD DISCH WASTE TROUBLE alarm is received and the FAIL light is lit.
2) What action, if any, must be taken to stop the release?

	Impact on lineup	Action required, if any
A.	No effect.	Continue release in accordance with the Off-Site Dose Calculation Manual
B. ✔	No effect.	Direct an Operator to Stop WD-23A, And CLOSE HCV-692.
C.	HIGH FLOW CONTROL VALVE, HCV-692 goes CLOSED.	Direct an Operator to Stop WD-23A
D.	HIGH FLOW CONTROL VALVE, HCV-692. goes CLOSED AND MONITOR TANK DISCH PUMP WD-23A STOPS.	No action is required.

073 Process Radiation Monitoring (PRM) System A2 Ability to (a) predict the impacts of the following malfunctions or operations on the PRM system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A2.02 Detector failure

K/A fit: Meets the KA because it asks the applicant to predict the effects of a detector failure on the system and asks what actions should be taken to mitigate the event.

RO 2.7 10 CFR 55.41 (b) (11) RO level, because it asks system/procedure level knowledge about a detector failure and subsequent actions that must be taken to mitgate the event. The RO applicant does not need to know the specifics of the ODCM requirements to answer the question, only that there are requirement to be met.

LP 7-12-03 EO 4.1 List the radiation monitors with automatic actuations and state the automatic actions that occur.

Justification for Distractors

A. Plausible, because there is no effect when a detector fails low, and releases are

A. Plausible, because there is no effect when a detector fails low, and releases are allowed IAW the ODCM. However, it is incorrect, because the ARP directs the operator to terminate the release IAW OI-WDL-3, which requires an operator in the building to stop WD-22A and close HCV-692. The release would be allowed to continue, but only after ensuring all ODCM requirements have been met.

B. **This is the correct action when a detector has failed low, since there are no automatic actions that occur. IAW the ARP. Although placing the ratemeter in KEYPAD is a directed action, it will not terminate the release, because all automatic functions are inoperable.**

C. Plausible, because the applicant may assume a detector failure, high or low, will terminate the release by closing HCV-692. And stopping WD-22A is an action directed by the procedure. However, this is incorrect. There are no automatic actions.

D. Plausible, because these are the automatic actions that occur with a High Radition alarm on RM-055 during a release. Incorrect, because there are no automatic actions.

References

CH-ODCM-1, Off-site Dose Calculation Manual
OI-RM-1, Radiation Monitoring
ARP-AI-33C/A33C Annunciator Response Procedure

Cog Level - High because the applicant must diagnose an abnormal condition ,that the detector has failed low, and how this failure will affect the lineup based on system knowledge, and what actions are necessary to mitigate this event.

New

Validators LOD 3.0

Rev 1

This question was used on the 2012 NRC exam, is this different enough?

D. HCV-691 and HCV-692 (Overboard Discharge Control Valves) and HCV-673 and HCV-679 (Monitor Tank Inlet Valves) will close and the Monitor Tank Pumps will continue to operate in recirculation mode.

KA#:	073000 A2.02	Bank Ref #:	
LP# / Objective:	7-12-03 04.01	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	ODCM	Handout:	

(51) QUESTION NUMBER: 051

Following conditions are present:

- Normal electrical lineup.
- CCW pump AC-3A running.
- CCW pumps AC-3B/C in standby.
- A FAULT exists on Transformer T1B-3C.
- All other equipment operated as designed.

1) Which of the CCW pumps will automatically start in this condition if AC-3A trips on motor overload, and
2) Two minutes after the start of the standby pump(s), a loss of 161 KV and 345 KV occurs. After the automatic response of equipment, which CCW pumps, if any, would be running?

	1) Pumps running after AC-3A trips	2) Pumps running after EDGs load
A. ✔	AC-3B	None
B.	AC-3B	AC-3B
C.	AC-3B and AC-3C	AC-3B
D.	AC-3B and AC-3C	AC-3B and AC-3C

076 Service Water System (SWS) K2 Knowledge of bus power supplies to the following: K2.04 Reactor building closed cooling water.

K/A fit: This question meets the KA because the student must know the Bus normal power supply for the pumps (specifically that for AC-3C the normal power supply has been lost) and also that the backup power supply does not automatically pick up the pumps unless there is a safeguards signal that has started the sequencers.

RO 2.5 10 CFR 55.41(b) (7) The question requires the applicant to use system knowledge of power supplies, interlocks, and the consequences of the stated alignment in an abnormal condition.

LP 7-11-06 EO 1.4 Explain standby operation of CCW pumps in terms of switch position and automatic actions.

Justification for Distractors

A. **This is the correct answer, because AC-3B will auto start, AC-3C would normally start in this condition,but it has no power supply without operator action to change the plant lineup. Operator action is not specified in this question.**

B. Plausible, the B pump will be the only standby pump to auto start, because it has a power supply, however this is incorrect because it will not auto start on the EDG unless a safeguards signal has started the sequencers.

C. Plausible, because the B pump will start and the C pump would normally also start. Incorrect, because the fault on transformer T1B-3C results in a loss of the power supply for AC-3C

D. Plausible, because the B pump will start and the C pump would normally also start, and the applicant may assume that both pumps auto start signal is still present after the EDGs load. This is incorrect, because the pumps do not auto start in this condition.

References

STM

Cog Level - High because the applicant must use system knowledge of the pump power supplies and use that knowledge to diagnose the final pump condion (running or not) in an abnormal condition.

New

Validators LOD 3.0

Rev 1

KA#:	076000 K2.04	Bank Ref #:	
LP# / Objective:	7-11-06 01.04	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	STM	Handout:	

(52) QUESTION NUMBER: 052

The plant is at 100% power. The Instrument and Service Air systems are in a normal alignment with Air Dryer CA-12 in service. The following conditions are observed while **NO** operator action is taken:

Time 0800 hours

CA-1A in Continuous Service	Running 200 Amps
CA-1B in Standby	Off
PLANT AIR PRESS PI-1700	95 psig lowering
INSTRUMENT AIR PRESS PI-1750	96 psig lowering
PLANT AIR PRESS LO alarm	lit

Time 0810 hours

CA-1A in Continuous Service	Running 200 Amps
CA-1B in Standby	Running 200 Amps
PLANT AIR PRESS PI-1700	82 psig lowering
INSTRUMENT AIR PRESS PI-1750	83 psig lowering
PLANT AIR PRESS LO alarm	lit
INSTRUMENT AIR PRESS LO alarm	lit

Time 0820 hours

CA-1A in Continuous Service	Running 200 Amps
CA-1B in Standby	Running 200 Amps
PLANT AIR PRESS PI-1700	50 psig lowering
INSTRUMENT AIR PRESS PI-1750	88 psig rising
PLANT AIR PRESS LO alarm	lit
INSTRUMENT AIR PRESS LO alarm	Blinking slow - reset

Which of the following descriptions explain the condition that is occurring?

A. Air Compressor CA-1A intake filter is plugged.

B. Leak in the Turbine Building Instrument Air Header.

C. ✔ Leak in the Service Air header in the Turbine Building.

D. CA-12 Purge Exhaust Shutoff valve PCV-1717 is stuck open.

078 Instrument Air System (IAS) A3 Ability to monitor automatic operation of the IAS, including: A3.01 Air pressure.

K/A fit: This question meets the K/A because it is asking the applicant to monitor the system as it responds in automatic mode.

RO 3.1 10 CFR 55.41 (b) (7) RO level, because it is asking the applicant to use indications available on his boards to determine what condition is present.

LP 7-11-04 EO 1.5 Explain the priciples of abnormal operation of the Compressed Air System in terms of flowpaths, major parameters (temperature, pressure flow, etc) alarms and control devices.

Justification for Distractors
Note: Service air is Plant Air.

A. Plausible, this would result in instrument air pressure lowering and the backup compressor starting. It is incorrect, because once the service air header isolates, instrument air pressure recovers and service air pressure continues to lower.

B. Plausible, this would result in instrument air pressure lowering and the backup compressor starting. It is incorrect, because once the service air header isolates, instrument air pressure recovers and service air pressure continues to lower.

C. **Correct answer, the Leak in the Service Air header in the Turbine Building will be isolated from the instrument air header when HCV-1730 goes closed at 80 psig, which will allow instrument air header pressure to rise and service air header pressure to continue to lower.**

D. Plausible, this would result in lowering instrument air header pressure; however it is incorrect, because the air dryer bypass valve would open at 78 psig lowering pressure and isolate the leak. With the service air header isolating at 80 psig, the instrument air pressure would not lower to 78 psig.

References

STM-CA

Cog Level - High The Applicant is being asked to diagnose the condition from a set of indications in the plant that are available on the main control board and knowledge of the system.

New

Validators LOD 3.0

Rev 1

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	078000 A3.01	Bank Ref #:	
LP# / Objective:	7-11-04 01.05	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	STM-CA	Handout:	

(53) QUESTION NUMBER: 053

Instrument Air has been isolated to containment due to an air leak. the following conditions exist:

- Safety Injection Tank SI-6A pressure is low.
- Pressurizer Pressure is rising.

1) Can the Safety Injection Tank (SIT) pressure be restored in this condition, if so, how?
2) How can Pressurizer Pressure be lowered in this condition?

	1) SIT Pressure raised	2) Pressurizer Pressure lowered
A.	No	Turn off Heaters ONLY
B. ✔	No	Turn off Heaters and/or Use Auxiliary Spray
C.	Yes, by adding Nitrogen	Turn off Heaters ONLY
D.	Yes, by adding Nitrogen	Turn off Heaters and/or Use Auxiliary Spray

078 Instrument Air System (IAS) K1 Knowledge of the physical connections and/or cause-effect relationships between the IAS and the following systems: K1.03 Containment air.

K/A fit: the question asks about how other systems on the Containment Instrument Air Header are affected by a loss of Instrument air.

RO 3.3 10 CFR 55.41(b) (8) The RO is being asked what systems/components are affected by a loss of air header pressure in containment, which is system level knowledge.

LP 7-17-17 EO 1.2 describe how the plant responds to a loss of instrument air in terms of how specific equipment is affected and how it affects overall plant operation and reliability.

Justification for Distractors

A. Plausible, because the applicant may not associate a loss of instrument air with a loss of nitrogen gas to the SITs, and heaters are a viable way to lower pressurizer pressure. This is incorrect, because there are two Auxiliary spray valves and one is solenoid operated.

B. This is the correct answer, nitrogen is not available

C. Plausible, because the applicant may not associate a loss of instrument air with a loss of nitrogen gas to the SITs, and and heaters are a viable way to lower pressurizer pressure. This is incorrect, because there are two Auxiliary spray valves and one is solenoid operated and the nitrogen valves to the SITs are operated by instrument air and fail closed.

D. Plausible, because the applicant may not associate a loss of instrument air with a loss of nitrogen gas to the SITs, and and heaters and auxiliary spray are available. This is incorrect, because the nitrogen valves are operated by instrument air and fail closed.

References

AOP-17 Loss of Instrument Air.

Cog Level - High

New

Validators LOD 3.0

Rev 1

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	078000 K1.03	Bank Ref #:	
LP# / Objective:	7-17-17 01.02	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	AOP-17	Handout:	

(54) QUESTION NUMBER: 054

Which one of the following would require entry into the action statement for Technical Specification, 2.6, Containment Integrity, during power operation?

A. The inner PAL door is open for more than 60 minutes for maintenance.

B. VA-746A and VA-746B, Containment Pressure Release Valves, are both opened for greater than 60 minutes without an approved release permit.

C✔ VA-280, Containment Hydrogen Purge Outboard Isolation to VA-80B, is intermittently opened under administrative control for surveilance testing.

D. VA-281, Containment Hydrogen Purge Fan VA-80B Suction Valve from Containment' is intermittently opened under administrative control for surveilance testing.

103 Containment System GENERIC 2.2.39 Knowledge of less than or equal to one hour Technical Specification action statements for systems.

KA Fit: If containmnet Integrity is not met, it must be restored within one hour per TS 2.6.

RO 3.9 10 CFR 55.41 (b) (7) This question asks about an action statement of one hour or less.

LP 7-17-12 EO 1.6 Explain any TS associated with the AOP.

Justification for Distractors

A. Only one PAL door may be opened at a time, but there is no associated time limit.

B. VA-746A and B are opened for a containment pressure reduction. A release permit is required, but not as a requirement for containment integrity.

C. **Correct answer TS 2.6.d: The containment isolation valves VA-280 and VA-289 shall be locked closed. Opening of these valves intermittently under administrative control is not allowed.**

D. Plausible, because it is the suction valve for the fan; but incorrect, because it is opened under administrative control as part of surveillance test OP-ST-VA-0001B.

References

Technical Specifications Section 2.6 Containment.

Cog Level - Low

New

Validators LOD 3.0

Rev 1

KA#:	103000 2.2.39	Bank Ref #:	
LP# / Objective:	7-17-12 01.06	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	TECH SPEC 2.6	Handout:	

(55) QUESTION NUMBER: 055

The plant is at 100% power. The following conditions are present:

- RELIEF VALVE CH-223 DISCH TEMP HI alarm window is lit on CB-1,2,3.
- LTDN HT EXCH THROTTLE VALVE LCV-101-1 is controlling letdown flow.

1) What actions will the operator take, and
2) What indication is monitored to ensure the condition that caused the alarm has stopped?

	Actions to take	Indication monitored
A.	Place LIMITER BYPASS SWITCH HC-101-3 IN BYPASS, **AND** Close LTDN HT EXCH THROTTLE VALVE LCV-101-1.	FIC-212 LETDOWN FLOW Lowering
B.	Place LIMITER BYPASS SWITCH HC-101-3 IN BYPASS, **AND** Close LTDN HT EXCH THROTTLE VALVE LCV-101-1.	LTDN RELIEF VLV OUTLET TEMP TIA-205 Lowering
C.	Close **BOTH** LTDN TO REGEN HT EXCH ISOLATION VALVE TCV-202, **AND** RC TO LDTN HT EXCH ISOLATION VALVE HCV-204.	FIC-212 LETDOWN FLOW Lowering
D. ✔	Close **BOTH** LTDN TO REGEN HT EXCH ISOLATION VALVE TCV-202, **AND** RC TO LDTN HT EXCH ISOLATION VALVE HCV-204.	LTDN RELIEF VLV OUTLET TEMP TIA-205 Lowering

103 Containment System A4 Ability to manually operate and/or monitor in the control room:A4.01 Flow control, pressure control, and temperature control valves, including pneumatic valve controller.

K/A fit: The question addresses a potential breach of containment issue where the applicant must recognize the correct action to operate pneumatic (TCV-202 is a temperature control valve, HCV-204 closes on high letdown pressure, and the LCV-101-1 valve controls flow) valves that will result in the relief valve reclosing.

RO 3.2 10 CFR 55.41 (b) (7) RO level because the applicant uses system knowledge to determine which set of valves, or valve will result in the relief valve reclosing, and which indication will provide proper response that the relief valve has reclosed.

Note: This is FCS OE for loss of containment integrity.

LP 7-11-02 EO 5.0 Explain the actions taken by the operator to monitor the CVCS.

Justification for Distractors

A. Plausible, this action will stop letdown flow from the containment, and letdown flow will lower (stop). Incorrect, this will not stop the relief valve from lifting, but will actually maintain it.

B. Plausible, this action will stop letdown flow from the containment, and this is the proper instrument to monitor. Incorrect, this action will not stop the relief valve from lifting, it will actually maintain it.

C. Plausible, this is the correct action to take and will result in letdown flow lowering. This is incorrect, because it is not the indication to monitor.

D. Correct, this action stops RCS flow/pressure to the relief valve that is lifting and TIA-205 will lower if the valve recloses.

References

ARP-CB-1,2,3/A2 Window A-1L

Cog Level - Low Memory, the steps an indication are listed in the ARP.

New

Validators LOD 3.0

Rev 0

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	103000 A4.01	Bank Ref #:	
LP# / Objective:	7-11-02 05.00	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	ARP-CB-123/A2	Handout:	

(56) QUESTION NUMBER: 056

The Loss of Coolant Accident procedure, EOP-03, was entered following completion of the Standard Post Trip Actions. During the recovery phase of the procedure the CRS directs restart of a Reactor Coolant Pump to initiate forced circulation.

Which of the following actual Pressurizer Level conditions would allow restart of an RCP?

A. 30% lowering

B. ✔ 30% rising

C. 50% rising

D. 55% lowering

002 Reactor Coolant System (RCS) A2 Ability to (a) predict the impacts of the following malfunctions or operations on the RCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A2.03 Loss of forced circulation.

K/A fit: the question address a loss of forced circulation, which will be addressed by restarting an RCP. There are several criteria for starting an RCP in this condition, but this question only address one aspect. The applicant must understand the limit and trend of the parameter and predict whether the pump could be started based on this specific criteria, although others would also have to be considered.

RO 4.1 10 CFR 55.41 (b) (10) RO level because it is asking the applicant to recall a specific criteria for starting an RCP in an EOP condition.

LP 7-18-13 EO 3.6 Given a copy of the RCP Restart Criteria Floating Step, explain the steps used to determine whether RCP restart criteria are satisfied.

Justification for Distractors

A. Plausble, the procedure states 30%, but incorrect, because it cannot be lowering.

B. This is the correct answer IAW

C. Plausible, the procedure states 50%, but incorrect, because it must be below 50%. In addition, it shortly will be above 50%.

D. Plausible, because it is trending toward 50%, but incorrect, because it is not allowed.

References

EOP/AOP Floating Step D. RCP Restart Criteria

Cog Level - Low memory

New

Validators LOD 4.0

Rev 0

KA#:	002000 A2.03	Bank Ref #:	
LP# / Objective:	7-18-13 03.06	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	EOP/AOP FLOATING RCP	Handout:	

(57) QUESTION NUMBER: 057

The plant is at 25% power and rising with the following indication and condition present:

- ROD WITHDRAWAL PROHIBIT alarm is lit.
- Outward rod movement has stopped.

Which "two-out-of-four" (2/4) RPS pre-trip conditions caused this alarm?

A. High Startup Rate, and
Thermal Margin/Low Pressure

B. Variable Over Power, and
Axial Power Distribution

C✔ High Startup Rate, and
Variable Over Power

D. Axial Power Distribution, and
Thermal Margin/Low Pressure

014 Rod Position Indication System (RPIS) K1 Knowledge of the physical connections and/or cause effect relationships between the RPIS and the following systems: K1.01 CRDS.

K/A fit: The RPS generates a CEA Withdrawal Prohibit that stops the control rod drive motors for any CEA being withdrawn.

RO 3.2 10 CFR 55.41(b) (6) RO level because it is asking about the design function of reactivity control mechanisms.

LP 7-12-26 EO 1.2d Describe the interface/interaction between the CRDS and the following systems/components: 1.2d Reactor Protective System.

Justification for Distractors

A. Plausible, because 2/4 Pre-trip on High Startup Rate will cause the alarm, and the Linear Power channels also feed into the TM/LP calculator. Incorrect, because 2/4 pretrip on TM/LP will not cause the alarm, or conditon.

B. Plausible, because 2/4 Pre-trip on Variable Over Power will cause the alarm, and the Linear Power channels also feed into the APD calculator. Incorrect, because 2/4 pretrip on APD will not cause the alarm, or condition.

C. This is the correct answer.

D. Plausible, because the Linear Power channels feed into both the APD calculator and TM/LP calculator. Incorrect, because 2/4 pretrip on APD or TM/LP will not cause the alarm or condition.

References

STM-Volume 11 Control Rod Drive System

Cog Level - Low memory.

Bank Questions 7-12-26 #012

Validators LOD 3.5

Rev 0

KA#:	014000 K1.01	Bank Ref #:	7-12-26 #012
LP# / Objective:	7-12-26 01.02D	Exam Level:	RO
Cognitive Level:	LOW	Source:	BANK
Reference:		Handout:	

(58) QUESTION NUMBER: 058

The "A" QSPDS is displaying a suspect alarm for one of the Core Exit Thermocouples (CET). The alarm has NOT been acknowledged.

1) How is the UN-ACKNOWLEDGED suspect CET alarm displayed on the QSPDS plasma screen, and
2) Will this suspect CET input be used in QSPDS calculations:

	1) How is the suspect CET displayed	2) used in calculations
A.	Normal Mode with a question mark in front of the value ?123.4	Not used
B.	Normal Mode with a question mark in front of the value ?123.4	Still used
C.	Inverse Mode with a question mark in front of the value ?123.4	Not used
D. ✔	Inverse Mode with a question mark in front of the value ?123.4	Still used

017 In-Core Temperature Monitor System (ITM) K6 Knowledge of the effect of a loss or malfunction of the following ITM system components: K6.01 Sensors and detectors.

K/A fit: the question addresses the effect that a failing CET detector has on control room indications.

RO 2.7 10 CFR 55.41 (b) (7) RO level because the question is asking about design component alarms and indications in the control room.

LP 7-12-23 EO 1.6 Explain the principles of operation (both normal and abnormal) of the QSPDS System in terms of signal flow paths, major parameters, (temperature, pressure, flow, etc.) alarms and control devices.

Justification for Distractors

A. Plausible, the failed input will have a ? in front of the indication. Incorrect, because it is displayed in the inverse mode and will still be used in the calculations.

B. Plausible, the failed input will have a ? in front of the indication, and will still be used in the calculations. Incorrect, because it is displayed in the inverse mode.

C. Plausible, because it is displayed in the inverse mode with a ?. Incorrect, it will not be used in calculations.

D. Correct, IAW OI-QSP-1.

References

OI-QSP-1 Qualified Parameter Display System

Cog Level - Low memory

New

Validators LOD 3.5

Rev 1

KA#:	017000 K6.01	Bank Ref #:	
LP# / Objective:	7-12-23 01.06	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	OI-QSP-1	Handout:	

(59)QUESTION NUMBER: 059

The containment air cooling and filtering system charcoal filters are designed to remove _____ from the containment.

A. Iodine

B. Fluorine

C. Smoke

D. Chlorine

027 Containment Iodine Removal System (CIRS) K5 Knowledge of the operational implications of the following concepts as they apply to the CIRS:K5.01 Purpose of charcoal filters.

K/A fit: The question asks about the purpose of charcoal filters.

RO 3.1 10 CFR 55.41(b) (7) RO level because it is asking about the purpose of an ESF component.

LP 7-14-02 EO-1.0 Give Specific plant conditions, apply the principles of operation of the Containment Cooling and Filtering System.

Justification for Distractors

A. Correct answer, per the design basis.

B. Plausible, because charcoal can adsorb Fluorine, but it is not the reason.

C. Plausible, because charcoal can adsorb/filter smoke lparticulates, but it is not the reason.

D. Plausible, because charcoal can adsorb Florine, but it is not the reason.

References

STM-RM

Cog Level - LOW

Bank and 2001 NRC exam 07-14-02 #008

Validators LOD 2.0

Rev 1

This question was on the 2012 NRC exam. Is it enough different from this one?

Question 91

According to the Technical Specifications (and their associated bases), what is required for iodine removal from the air in containment during the design basis Loss of Coolant Accident?

A. One VA-7 cooling unit and one VA-3 cooler and filtering unit because sodium tetraborate is not effective above a pH of 7.
B. One VA-7 cooling unit and one VA-3 cooler and filtering unit because sodium tetraborate is not effective below a pH of 7.
C. One containment spray pump and one VA-3 cooler and filtering unit because it contains a charcoal filter.
D. One containment spray pump and one VA-7 cooling unit because it contains a HEPA filter.

KA#:	027000 K5.01	Bank Ref #:	7-14-02 #8
LP# / Objective:	7-14-02 01.00	Exam Level:	RO
Cognitive Level:	LOW	Source:	BANK
Reference:	STM	Handout:	

(60) QUESTION NUMBER: 060

In order to maintain Spent Fuel Pool cleanliness, ___(1)____ of the Spent Fuel Pool Cooling System flow goes through ___(2)____.

A. (1) ALL
(2) a filter, but ONLY a portion goes through a demineralizer.

B. (1) ALL
(2) A filter, and ALL of the filtered flow goes through a demineralizer.

C✔ (1)ONLY a portion
(2) A filter and a demineralizer.

D. (1) ONLY a portion
(2) A filter,and only a portion of the filtered flow goes through a demineralizer.

033 Spent Fuel Pool Cooling System (SFPCS) K4.02 Knowledge of design feature(s) and/or interlock(s) which provide for the following:Maintenance of spent fuel cleanliness.

RO 2.5 10 CFR 55.41 (b) (7) RO level because it requires a general knowledge of the components and the flow path through the system and their design function.

K/A Fit: The question requires knowledge of the design features of the Spent Fuel Pool Cooling System that maintain spent fuel cleanliness

FCS Lesson Plan / Objective 07-11-24 EO 01.03d STATE the function of each of the following major components of the Spent Fuel Pool Cooling System: Demineralizer (AC-7)

Justification for Distractors

Choice C: This is the correct answer. a portion of the flow is diverted through a filter an demineralizer.

Choices A, C and D: All of these choices are plausible as they would maintain spent fuel pool cleanliness. However, They are incorrect because All flow from the spent fuel cooling pumps does not go through a filter and demineralizer. Also all the flow that is filtered goes through the demineralizer, not a portion of it.

References

STM 44

Cog Level -Low

Bank Question 07-11-24 012 modified

Validators LOD 2.0

Rev 1

KA#:	033000 K4.02	Bank Ref #:	07-11-24 #12
LP# / Objective:	7-11-24 01.03D	Exam Level:	RO
Cognitive Level:	LOW	Source:	2007 NRC EXAM
Reference:	STM 44	Handout:	

(61) QUESTION NUMBER: 061

The plant is at 100% power, with all controls in automatic.

- The AUTO-INHIBIT switch [HC-909] on CB-10 has failed to the INHIBIT Position.

How will the Steam Dump Valves and Bypass Valve respond following a turbine trip?

A. ✔ Modulate in PRESSURE MODE to maintain pressure set point.

B. Modulate in TEMP/PRESSURE MODE to maintain Temperature set point.

C. Quick Open, then modulate in PRESSURE MODE to maintain pressure set point.

D. Quick Open, then modulate in TEMP/PRESSURE MODE to maintain Temperature setpoint.

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

041 Steam Dump System (SDS) and Turbine Bypass Control
K 6 Knowledge of the effect of a loss or malfunction on the following will have on the SDS K6.03 Controller and positioners, including ICS, S/G, CRDS.

K/A fit: The question is asking how a failure in an interlock in the steam dump and bypass system affects its operation.

RO 2.7 10 CFR 55.41 (b) (7) Question is asking about the design of how a control system reponds in an abnormal (failure) condition.

LP 7-12-31 2.0 Explain the operation of the Reactor Regulating System.

Justification for Distractors

A. **Correct choice. With HC-909 placed in or failed to the INHIBIT Position, the temperature input will be blocked and the SD&B valves will modulate in the pressure mode.**

B. Incorrect, the temperature input will be blocked with HC-909 failed to the inhibit position.

C. The quick open feature which depends on temperature will be blocked with HC-909 in the INHIBITposition. This is the normal system response if HC-909 is in the auto position.

D. Incorrect, the temperature input will be blocked with HC-909 failed to the inhibit position.

References

STM-RR-Volume 36 Instrumentation and Reactor Regulating Systems

Cog Level - High The applicant is being asked to diagnose the system response in an abnormal condition.

Bank question 7-12-31 #25

Validators LOD 3.0

Rev 1

KA#:	041000 K6.03	Bank Ref #:	07-12-31 025
LP# / Objective:	7-12-31 02.00	Exam Level:	RO
Cognitive Level:	HIGH	Source:	BANK
Reference:		Handout:	

(62)QUESTION NUMBER: 062

The plant is at 100% power with the following conditions:

- "HYDR FLUID PRESS PUMP A OVERLOAD OR STOPPED" Alarm lit.
- HYDRAULIC PUMP EHC-3A AMMETER A/EHC-3A running 50 amps
- HYDRAULIC PUMP EHC-3B AMMETER A/EHC-3B running 50 amps

1) At what lowering EHC pressure set point does this alarm occur, and
2) Given this set of conditions, what is the next action to take?

	Setpoint	Action to be taken
A.	1100 psig	Trip the Turbine
B.	1100 psig	Ensure EHC Pressure is rising
C.	1500 psig	Trip the Turbine
D✔	1500 psig	Ensure EHC Pressure is rising

SYSTEM 045 Main Turbine Generator (MT/G) System A3 Ability to monitor automatic operation of the MT/G system, including: A3.05 Electrohydraulic control.

K/A fit: This question requires the operator to interpret the plant condition, remember a setpoint and monitor the plant for an expected response.

RO 2.6 10 CFR 55.41 (b) (7)

LP 7-12-29 EO 1.1 State the controls, indications and annunciators for the EHC Power Unit available to the operator in the control room.

Justification for Distractors

Explanation: There are two EHC pumps, one normally running and one in standby. The alarm HYDR FLUIT PRESS PUMP A OVERLOAD OR STOPPED indicates to the operator that pressure is low and the standby pump should start. The operator should immediately ensure that pressure is rising, or get ready to trip the unit.

A. Plausible, this is a trip setpoint for the EHC system, and if the turbine has not tripped the operator should trip the turbine. Incorrect, because this is not the setpoint for auto start of the standby pump.

B. Plausible, because this is a setpoint for EHC and it would seem to be a good idea to ensure pressure is rising: however, it is incorrect, because a trip setpoint has been reached and if the turbine did not trip the operator should trip the turbine.

C. Plausible, because this is the setpoint for the alarm; however, the operator is not directed to trip the turbine at this pressure, but to insure pressure is rising, since both pumps are operating. Therefore, this is incorrect.

D. This is the correct answer, the alarm comes in at 1500 psig lowering pressure and with both pumps running, the operator should ensure system pressure is recovering. If it is not, then he should trip the pump.

References

ARP-CB-10,11/A10 Window B-2U

STM-MT-Volume 26 Main Turbine and Turbine Auxiliaries System.

Cog Level - Low

Bank Question 7-12-29 #7

Validators LOD 2.0

Rev 1

KA#:	045000 A3.05	Bank Ref #:	
LP# / Objective:	7-12-29 01.01	Exam Level:	RO
Cognitive Level:	LOW	Source:	BANK
Reference:	STM-MT	Handout:	

(63) QUESTION NUMBER: 063

Concerning the Reactor Coolant Drain Tank pumps:

1) What is a purpose of the larger capacity Reactor Coolant Drain Tank pump, and
2) The RCDT PUMP OUTLET VALVEs, HCV-500A/B, have been opened with a Containment Isolation Signal (CIAS) present, how long will they remain open before automatically going closed?

	Purpose of WD-2A	Opened with CIAS/how long?
A.	To transfer the contents of the Reactor Coolant Drain Tank through the suction of the Fuel Transfer Canal Drain Pumps.	15 minutes
B.	To transfer the contents of the Reactor Coolant Drain Tank through the suction of the Fuel Transfer Canal Drain Pumps.	30 minutes
C.	To re-circulate water from the Refueling Canal low point drain to the Spent Fuel Storage Pool Demineralizers and Filter.	15 minutes
D. ✔	To re-circulate water from the Refueling Canal low point drain to the Spent Fuel Storage Pool Demineralizers and Filter.	30 minutes

068000 Liquid Waste Disposal 2.1.28 Knowledge of the purpose and function of major system components and controls.

K/A Fit: The qustion requires knowledge of the purpose and function of the 250 gpm RCDT pump and how controls for the discharge valves will work following a CIAS.

RO 4.1 10 CFR 55.41 (b) (7) RO level because it is asking the applicant to choose the correct facility operating characteristics for these components from memory.

LP 7-11-32 EO 1.1 Explain the normal operation of the WDLS including normal flowpath and parameters.

Justification for Distractors

Since the two RCDT pumps are two different capacities (WD-2B is 50 gpm and WD-2A is 250 gpm) I would not expect the applicant to remember which is which, so I provided that in the stem, it is not an attempt to "teach in the stem."

A. Plausible because the RCDT pumps can take a suction from the refuelling canal low point drain thus interfaces with Fuel transfer canal. Incorrect, because it interfaces with the discharge of the transfer canal drain pumps, not the suction, and the valves can be opened with a CIAS present.

B. Plausible because the RCDT pumps can take a suction from the refuelling canal low point drain thus interfaces with Fuel transfer canal.

C. To recirculate water from the Refueling Canal low point drain to the Spent Fuel Storage Pool demineralizers and filter is the correct answer. It is incorrect, because the valves can be opened with a CIAS present.

D. **To recirculate water from the Refueling Canal low point drain to the Spent Fuel Storage Pool demineralizers and filter is the correct answer, and the valves can be opened for 30 minutes with a CIAS present.**

References

STM-48 Radioactive Waste Disposal System

Cog Level - Low

Significantly modified to include both components and controls.

Validators LOD 3.0

Rev 1

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	068000 2.1.28	Bank Ref #:	7-11-32 #9
LP# / Objective:	7-11-32 01.01	Exam Level:	RO
Cognitive Level:	LOW	Source:	BANK
Reference:	STM-WD	Handout:	

(64)QUESTION NUMBER: 064

Waste Gas Decay Tank WD-29A is being released in accordance with OI-WDG-2, Attachment 1, Automatic Waste Gas Release. The following alarms and condtions are present in the control room on AI-44:

- 480 V MOTOR OVERLOAD TRIP
- AUX BLDG AIR PRESSURE HIGH
- **NO** Auxiliary Building Exhaust Fans are running.

With these conditions, which of the following needs to be performed next?

A. Verify the presence of smoke in the Auxiliary Building.

B. Line up to the Gas Decay Tank to the hydrogen purge filter.

C. Place VA-66, Fuel Handling Area Charcoal Filter in service.

D. Immediately terminate the release from the Waste Gas Decay Tank.

071 Waste Gas Disposal System (WGDS) SYSTEM: 071 Waste Gas Disposal System (WGDS) A1 Ability to predict and/or monitor changes in parameters(to prevent exceeding design limits) associated with Waste Gas Disposal System operating the controls including:A1.06 Ventilation system.

K/A fit: The applicant is being asked about the effect the change in auxiliary building ventilation conditions have on the waste gas release and what actions to take to prevent exceeding the requirements of the release permit.

RO 2.5 10 CFR 55.41(b) (5) RO level, the question asks about the response that should be taken for the alarms present in the control room and their effect on the operating limitations (waste gas release prerequisites) and the actions to take in this condition.

LP 7-11-31 EO 1.3 Using the ARPs as a guide, interpret the alarms received in the control room associated with the Waste Disposal (Gas) System and explain the required operator action.

Justification for Distractors

A. Plausible, because smoke in the building would result in tripping the AB Exhaust Fans and result in high pressure. Incorrect, the ARP directs the waste gas release be terminated.

B. Plausible, because this lineup is possible and would filter some gas and particulate from the release, but the issue is not dilution flow from an exhaust fan, that is why the ARP directs the waste gas release to be terminated.

C. Plausible, this would provide a flowpath through a charcoal filter to remove iodine if

it was present and minimize off-site dose. Incorrect, it would only reduce dose if an exhaust fan was in service.

D. Correct IAW ARP actions

References

OI-WDG-2 Waste Gas Disposal System Release
ARP-AI-44/A39 Annunciator Response Procedure
STM-3 Auxiliary Building Ventilation System

Cog Level - Low memory

New

Validators LOD 2.5

Rev 0

KA#:	071000 A1.06	Bank Ref #:	
LP# / Objective:	7-11-31 01.03	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	ARP-44	Handout:	

(65) QUESTION NUMBER: 065

PCV-1753, Service Air System Automatic Isolation Valve, automatically closes when_____(1)_____pressure is sensed at__(2)___ and reopens when pressure rises to ___(3)___.

	(1)	(2)	(3)
A.	Service air	80 psig	85 psig
B.	Service air	84 psig	94 psig
C. ✔	Instrument air	80 psig	85 psig
D.	Instrument air	84 psig	94 psig

079 Station Air System (SAS) A4 Ability to manually operate and/or monitor in the control room: A4.01 Cross-tie valves with IAS.

K/A fit: because the question deals with service air system response to changing instrument air pressure that can be monitored from the control room.

RO 2.7 10 CFR 55.41(b) (7) RO level, the question asks about the facility operating characteristics of the service air system that can be monitored from the control room.

LP 7-11-07 EO 1.5 Explain the principles of abnormal operation of the compressed air system in terms of flowpaths, major parameters, (temperature, pressure, flow, etc.) alarms and control devices.

Justification for Distractors

A. Plausible, because these are the correct setponts. Incorrect, it is measured in the Instrument Air Header.

B. Plausible, if the applicant thinks it is measured in the Service Air Header, and these are valid setpoints (84 psig is IA HDR pressure low and 94 psig is standby compressor starts)

C. Correct

D. Plausible, these are valid setpoints (84 psig is IA HDR pressure low and 94 psig is standby compressor starts), Incorrect, because of setpoints.

References

OI-CA-1 Compressed Air Normal Operation

Cog Level - LOW memory

Bank Question 07-11-07 #16

Validators LOD 2.5

Rev 0

KA#:	079000 A4.01	Bank Ref #:	
LP# / Objective:	07-11-07 01.05	Exam Level:	RO
Cognitive Level:	LOW	Source:	BANK
Reference:	OI-CA-1	Handout:	

(66)QUESTION NUMBER: 066

A Reactor Operator has been directed to supervise an activity that will be performed by the Turbine Building Operator. The Control Room Supervisor has directed a Basic Briefing be conducted for this activity.

What aspect of this briefing will differ from a Formal Briefing?

A. Human Performance Tool Box.

B. Required actions for unexpected results.

C. The Reactor Operator conducts this briefing.

D. ✔ Turbine Building Operator conducts this briefing.

2.1 Conduct of Operations (continued) 2.1.8 Ability to coordinate personnel activities outside the control room.

K/A fit: the question addresses the basic briefing responsibilities for an RO prior to directing the activities of the Turbine Building Operator.

RO 3.4 10 CFR 55.41 (b) (10) RO level because it addresses an administrative procedrue the RO is responsible to perform.

LP 4-1-6 EO 2.0 Explain the expectations within SO-O-1, Conduct of Operations, OPD-3-8, Briefings Under Normal/Emergency Conditions Operations Standards, and FCSG-7, Human Performance as they pertain to plant communications.

Justification for Distractors

A. Plausible, because it may not be necessary to address all aspects in the Human performance Tool Box (HPTB). Incorrect, the HPTB is always applicable.

B. Plausible, an applicant might assume basic brief task would have not unexpected results. Incorrect, the basic brief is specific that unexpected results are covered.

C. Plausible, the applicant might think the CRS delegates this to the RO and in fact, the RO can conduct formal briefings, and could perform a reverse briefing. Incorrect, because this is done as a reverse briefing by the individual performing the action.

D. This is the correct answer IAW OPD-3-7. This is different from a formal briefing where the formal briefing leader would conduct the brief and use a reverse technique to have each individual explain thier part in the activity.

References

OPD-3-8, Briefings Under Normal/Emergency Conditions Operations Standards

Cog Level - LOW memory

New

Validators LOD 2.5

Rev 1

KA#:	000000 2.1.08	Bank Ref #:	
LP# / Objective:	4-1-6 02.00	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	OPD-3-8	Handout:	

(67) QUESTION NUMBER: 067

When reporting the status of a 480 VAC Bus 1B3B-4B the proper phonetic communication should be spoken as Bus_____:

A. 1B3B-4 Bravo

B. ✔ 1B3 Bravo-4 Bravo

C. 1Bravo 3B-4 Bravo

D. 1 Bravo 3 Bravo-4 Bravo

2.1.38 Knowledge of the station's requirements for verbal communications when implementing procedures.

K/A fit: The question requires the applicant to correctly identify the proper phonetic communication that would be used for the specific discriminator.

RO 3.7 10 CFR 55.41 (b) (10) RO level because it addresses a proper communication method from an administrative procedrue that is used daily.

LP 4-1-6 EO 1.0 Describe how to communicate in a manner to information and instructions are transmitted and received more effectively.

Justification for Distractors

A. Plausible, if the applicant is not sure what the specific determiner is. Incorrect, because the specific determiner for an island bus is 3B-4B which should be phonetic.

B. Correct IAW OPD-3-7

C. Plausible, if the applicant believes the specific determiner is the first and last letter of the component. Incorrect, as stated above.

D. Plausible, if the applicant believes that all letters should be spoken phonetically. Incorrect as stated above

References

OPD-3-7 Operation Communication Performance Standard

Cog Level - LOW

New

Validators LOD 2.0

Rev 0

KA#:	000000 2.1.38	Bank Ref #:	
LP# / Objective:	04-01-06 01.00	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	OPD-3-7	Handout:	

(68) QUESTION NUMBER: 068

All CEAs are fully inserted and preparations are being made to perform a reactor startup by CEA withdrawal. The Estimated Critical Condition calculation indicates the boron concentration should be raised by 250 ppm prior to taking the reactor critical.

According to OP-2A, which of the following sequences of steps is acceptable?

A. Borate to the ECC boron concentration, withdraw the non-trippable CEAs, withdraw the shutdown CEAs, withdraw the regulating CEAs.

B. ✔ Borate to the ECC boron concentration, withdraw the shutdown CEAs, withdraw the non-trippable CEAs, withdraw the regulating CEAs.

C. Withdraw the shutdown CEAs, withdraw the non-trippable CEAs, withdraw the regulating CEAs, borate to the ECC boron concentration.

D. Withdraw the non-trippable CEAs, withdraw the shutdown CEAs, borate to the ECC boron concentration, withdraw the regulating CEAs.

2.2 Equipment Control 2.2.1 Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.

K/A fit: This question asks the applicant to recall the proper order for operations to take the reactor critical.

RO 4.5 10 CFR 55.41 (b) (10) RO level, because the question is asking for a "big picture" look at a reactor startup, not memorized individual steps.

LP 8-11-09 5.0 The CRS/ATCO/BOPO will perform a reactor startup.

Justification for Distractors

Meets the K/A because it is testing the ability of the operator to choose the correct order of events (not procedural steps) that should be performed to prepare the plant for taking the reactor critical.

A, C, and D are all Plausible, depending on the ability of the applicant to decide the correct order of withdrawing rods given whether a dilution or boration must be performed for startup. Implicit with making the correct determination for the order of the actions is the ability of the operator to make a conservative decision and ensure that adequate shutdown margin is always maintained, hence you can borate before pulling the shutdown groups and non-trippable CEAs, but not the other way around. In addition, the Non-trippable CEAs do not provide "instantaneous shutdown margine" and therefore are not credited on a trip.

B. **this is the correct answer because a boration is being performed, in accordance with the procedure.**

References

OP-2A Plant Startup Attachment 2, CEA Withdrawal to Criticality Mode 2

Cog Level - Low because it is testing the applicants ability to remember the order of events based on the type of reactor startup (CEA withdrawal Vs. dilution).

Bank 7-12-26 #17

Validators LOD 3.0

Rev 1

KA#:	000000 2.2.01	Bank Ref #:	7-12-26 #017
LP# / Objective:	8-11-09 05.00	Exam Level:	RO
Cognitive Level:	LOW	Source:	BANK
Reference:	OP-2A	Handout:	

(69)QUESTION NUMBER: 069

The plant is in the process of starting up. The following conditions exist:

- Tcold 525°F
- WR power $1x10^{-7}$%
- River Temperature 65°F
- Raw Water Pumps AC-10A/B/C Operable
- Raw Water Pump AC-10D In-operable
- Charging Pumps CH-1A/B Operable
- Charging Pump CH-1C OOS

What action must be taken to meet the requirement to be in Mode 2, Hot Standby?

A. Raise Tcold to $\geq$ 532°F.

B. ✔ Take the reactor critical.

C. Restore CH-1C to Operable.

D. Restore AC-10D to Operable.

GENERIC 2.2.35 Ability to determine Technical Specification Mode of Operation.

K/A fit: The question is asking the applicant to decide what is required to enter a mode.

RO 3.6 10 CFR 55.41 (b) (5) RO level because it is asking requirements for mode change and not LCO action statements.

LP 7-11-20 EO 2.1 Define the various modes for operability.

Justification for Distractors

Expanation:The reactor is declared critical administratively if the decision by the RO has not been done previously. At FCS the reactor will not be critical at this low a power level.

A. Plausible, because 532°F is the normal temperature maintained at hot zero power with steam generator pressure at 900 psia, and OP-2A, Plant Startup requires a temperature of 529 - 535°F. This is incorrect, because Mode 2, by TS definition only needs to be above 515°F

B. **This is the correct answer and the missing piece of the definition.**

C. Plausible, because most TS require all equipment to be Operable to take the reactor critical. It is incorrect, because only 2 charging pumps are required to be operable above 210°F.

D. Plausible, because most TS require all equipment to be Operable to take the reactor critical, but allow a reduction in requirements after the reactor is critical, but TS 2.4 allows one Raw Water Pump to be OOS. What makes this more plausible is that River Temperature is > 60°F. TS 2.4 allows one RW pump to be inoperable indefinitely, when river temperature is <60 degrees, but applies an action statement when it is above 60°F. It is incorrect, because one pump can be inoperable to take the reactor critical.

References
TS sections Definitions, 2.2, and 2.4

Cog Level - High The applicant must apply knowledge of different TS and plant conditions to determine what requirement must be met to enter Mode 2.

New

Validators LOD 2.0

Rev 2

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	000000 2.2.35	Bank Ref #:	
LP# / Objective:	7-11-20 02.01	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	TS	Handout:	

(70) QUESTION NUMBER: 070

During a refueling outage, the Water Plant operator discovers a breaker in the switchgear room that has been removed from it's cubicle. The breaker has a danger tag attached to it, and Electrical Maintenance (EM) is preparing to take the breaker to the shop for maintenance and testing.

Which of the following is the proper action concerning this Danger Tag?

A. ✔ The Danger Tag should be attached to the breaker cubicle door.

B. The Danger Tag is removed and replaced with a Local Control Tag on the Breaker.

C. The Danger Tag should be removed and the breaker listed as a "No Tagged" item on the clearance.

D. The Danger Tag should remain with the breaker so that it is returned to the correct cubicle in the correct position.

GENERIC 2.2.14 Knowledge of the process for controlling equipment configuration or status.

K/A fit: Compliance with the tagging procedure ensures not only personnel and equipment protection, but system configuration managment so plant personnel are able to ascertain that a system has been made safe.

RO 3.9 10 CFR 55.41 (b) (10) The question asks the student about a process controlled by an administrative procedure.

LP 7-62-01 EO SO-G-20A EO 2.1 State when Danger Tags will be used.

Justification for Distractors

A. This is the correct answer IAW SO-G-20A.

B. Plausible, since EM will be conducting tests on the breaker there will be a need to operate it. This is incorrect, because a local control tag is only for components left in the system.

C. Plausible, since this is an option for other equipment: however, not for breakers.

D. Plausible, since this makes sense from an equipment configuation standpoint; however, this is incorrect since the restoration position is specified on the tag sheet.

References

SO-G-20A

Cog Level - Low

Bank Question LR-ADMIN-RO #037

Validators LOD 2.0

Rev 1

KA#:	000000 2.2.14	Bank Ref #:	LR-ADMIN-RO #037
LP# / Objective:	7-62-01 02.01	Exam Level:	RO
Cognitive Level:	LOW	Source:	BANK
Reference:	SO-G-20A	Handout:	

(71) QUESTION NUMBER: 071

A contract maintenance worker, who has previously received a TEDE of 3850 mrem for the current year, was in containment during RCS venting. During this venting operation, the radioactive gas concentration in containment was estimated to be 20 times the Derived Airborne Concentration. The radiation in the area was 50 mr/hr. The maintenance worker was in containment for 2.5 hours with no respiratory equipment.

1) What contribution to his TEDE did the operator receive during this evolution, and
2) How does his annual dose compare to the 10 CFR Part 20 Regulatory limits?

(Note: 1 DAC-hour results in a 2.5 mrem CEDE)

	Additional TEDE received	Within or Exceeds Regulatory Limits
A.	125 mrem	Within
B.	175 mrem	Exceeds
C. ✔	250 mrem	Within
D.	250 mrem	Exceeds

GENERIC Radiation Control 2.3.4 Knowledge of radiation exposure limits under normal or emergency conditions.

K/A fit: The student must know the FCS Administrative Dose Limit, and understand the DAC concept to properly calculate the dose received and determine if the limit has been exceeded.

RO 3.2 10 CFR 55.41 (b) (12) RO level because it is asking about radiological safety principles and procedures.

FCS Lesson Plan / Objective 1924-03 01.00 Given a copy of the Radiation Protection procedures, DEFINE the following types of controlled, contaminated, and radiation areas at Fort Calhoun Station and EXPLAIN the controls, posting requirements, access requirements, and limits for each.

Justification for Distractors

A. Plausible, if the applicant fails to account for the dose due to the airborne activity. and this would be within both the Regulatory and Administrative limits.

B. Plausible if the applicant multiply the DAC concentration by either 2.5 hours or 2.5 mrem (but not both). (50 mremx 2.5 hours) + (2.5 x 20)=175 mrem . 157 mrem + 3850 mrem = 4025 mrem is greather than the 4000 mrem (4.0 REM) Administrative Limit. The applicant could chose this if the dose is compared to the Administrative Limit. However, this is incorrect, because the actual dose is 250 mrem.

C. **Correct, because (50 mremx 2.5 hours) + (2.5 hoursx 2.5 mrem/DAC - hour x 20)=250 mrem dose received. 250mrem + 3850 mrem = 4100 mrem, which is greater than the Administrative Limit, but not the Regulatory Limit.**

D. Plausible, if the applicant confuses the Administrative Limit with the Regulatory Limit and does the math correctly.

References

SO-G-101, Radiation Worker Practices
RP-656

Cog Level - High the applicant must apply the dose rates to a calculation and then compare those to the limit of 1000 mr/year.

Significantly modified - Previous Question from 2004 Exam

Validators LOD 3.0

Rev 1

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	000000 2.3.04	Bank Ref #:	1924-03 #7
LP# / Objective:	19-24-03B 01.00	Exam Level:	RO
Cognitive Level:	HIGH	Source:	2004 NRC EXAM
Reference:	RPP	Handout:	

(72) QUESTION NUMBER: 072

The plant has experienced failed fuel assemblies and a primary-to-secondary leak. What is the purpose for maintaining a constant Condensate Storage Tank (CST) level in this condition in accordance with SO-O-43, Fuel Reliability Management Plan?

A. Prevent loss of condenser vacuum due to vortexing in the CST.

B. ✔ To prevent overflowing the CST and causing an unmonitored release.

C. To ensure a reliable source of makeup to FW-54, Diesel Driven Auxiliary Feedwater Pump.

D. Provide makeup to the condenser during a downpower as condensate temperature lowers.

Generic 2.3.11 Ability to control radiation releases.

RO 3.8 10 CFR 55.41 (b) (13) RO level because it is asking for the reason of a mitigating stategy lineup, and not the exact valve lineup.

K/A Fit: Question addresses minimizing radiation release with failed fuel. This is not a system specific question because it addresses a mitigating strategy to stop a release to the environment that affects several systems (Auxiliary Feedwater, Condensate, Condenser, and Demineralized water makeup.)

LP 7-17-22 EO 1.3 Describe the major recovery actions of this AOP.

Justification for Distractors

A. Plausible because a low level will result in loss of condenser vacuum due to air ingress. Incorrect, because this is not the reason cited in SO-O-43.

B. This is the correct answer, because normally the CST is kept full by constant overflow to the river by demineralized water makeup from the RO unit.

C. Plausible, because FW-54 takes a suction from the CST and this would be needed for reliability if the plant tripped and a loss of off-site power occurred. Incorrect, because the tank is normally kept full and this is not the reason for stopping the overflow.

D. Plausible because this is the source of normal makeup to the CST and would still fulfill this function. Incorrect, because level in the hotwell is no longer a variable setpoint, it is not a constant setpoint.

References

SO-O-43, Fuel Reliability Management Plan

Cog Level - Low

New

Rev 0

KA#:	000000 2.3.11	Bank Ref #:	ADM-RO #6
LP# / Objective:	07-17-22 01.03	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	SO-O-43	Handout:	

(73) QUESTION NUMBER: 073

The plant was shut down due to a switchyard fault. The following conditions exist:

- Breaker 1A22, 345KV Normal Feed to Bus 1A2 is tripped.
- 1A22 Breaker switch Red Flag
- 1A22 Green light On
- 1A22 White light On
- 1A22 Red light Off

The BOPO has been directed to “match flag” on Breaker 1A22.

1) How is this manipulation performed, and
2) What will the Breaker 1A22 indications be if this is performed properly?

	Manipulation performed	Final Indications	
A.	Place 1A22 control switch in TRIP Then return to Neutral	1A22 Breaker switch 1A22 Green light 1A22 White light 1A22 Red Light	Green Flag On On Off
B. ✔	Place 1A22 control switch in TRIP Then return to Neutral	1A22 Breaker switch 1A22 Green light 1A22 White light 1A22 Red Light	Green Flag On Off Off
C.	Place 1A22 control switch in PULL TO LOCK Then return to Neutral	1A22 Breaker switch 1A22 Green light 1A22 White light 1A22 Red Light	Black Flag On On Off
D.	Place 1A22 control switch in PULL TO LOCK Then return to Neutral	1A22 Breaker switch 1A22 Green light 1A22 White light 1A22 Red Light	Black Flag On Off Off

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

GENERIC 2.4.17 Knowledge of EOP terms and definitions.

K/A fit: This question requires the applicant to understand the meaning of "matching flags" and what the expected indications are if done properly.

RO 3.9 10 CFR55.41 (B) (10) RO level, because it is asking how equipment is manipulated and the meaning of a direction in the EOP/AOP users manual.

LP 7-78-01 EO 1.3 Be able to operate specific control room switches and controls.

Justification for Distractors

A. Plausible, because the manipulation is correct, and the final position will be Green Flagg. Incorrect, because the white light will be Off.

B. This is the correct way to manipulate the switch and the expected indications.

C. Plausible, because even though the operator has gone too far with the switch, this would still work. However, this is incorrect, because the indication cited in the distractor is incorrect. The black flag only indicates while the switch is in the P-T-L position.

D. Plausible, because even though the operator has gone too far with the switch, this would still work, and the final light indication would be correct. However, the Black flag makes it incorrect.

References

OPD-4-9 EOP/AOP Users Guidelines

Cog Level - Low

New

Validators LOD 2.0

Rev 1

KA#:	000000 2.4.17	Bank Ref #:	
LP# / Objective:	7-78-01 01.03	Exam Level:	RO
Cognitive Level:	HIGH	Source:	NEW
Reference:	OPD-4-9	Handout:	

(74) QUESTION NUMBER: 074

The plant was shutdown as a result of a high energy line break in containment. Subsequently, the ERFCS computer became inoperable resulting in a loss of all ERFCS generated alarms.

AOP-34, “LOSS OF THE ERF or QSPDS,” has been entered.

I&C was contacted and has taken the following Voltage readings per Handout Attachment A, “Containment Temperature Determination Without ERF.”

- T887 0.55 volts
- T888 0.54 volts
- T889 0.56 volts
- T890 0.53 volts

Based on the above voltage information from I&C, what is the highest Containment temperature?

A. Between 174 and 176°F

B. ✔ Between 179 and 181°F

C. Between 269 and 271°F

D. Between 279 and 281°F

GENERIC 2.4.32 Knowledge of operator response to loss of all annunciators.

K/A fit: The most likely loss of alarm capability would be a loss of power to the ERFCS computer system. In this condition some functions can be performed using backup methods, which determination of containment temperature can be performed using voltages provided by I&C.

RO 3.6 10 CFR 55.41 (b) (10) RO level, this question requires the applicant to perform a calculation in an AOP using the attachment. This is an RO function.

LP 7-17-34 EO 1.3 Describe how the overall plant operation and reliability is affected by the loss of each of the computer systems.

Justification for Distractors

A. Plausible, if the applicant chooses to throw out the highest value as it might be for determination of a representative temperature. Incorrect, because this is not required by the procedure.

B. This is the correct answer, IAW AOP-34 Attachment A.

C. Plausible, if the applicant uses 0.02 instead of 0.2. Incorrect, because this is not IAW the the calculation.

D. Plausible, if the applicant does not subtract the 0.2. Incorrect, because this is not IAW the the calculation.

References

AOP-34 Loss of the ERF or QSPDS

Cog Level - Low: this is a basic calculation

New

Validators LOD 3.0

Rev 0

KA#:	000000 2.4.32	Bank Ref #:	
LP# / Objective:	7-17-34 01.03	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	AOP-34	Handout:	

(75) QUESTION NUMBER: 075

Given the following condition:

- CCW Discharge Pressure is 50 psig

Which of the following meets the EOP-00, Standard Post Trip Actions, Maintenance of Vital Auxiliaries Safety Function for "CCW and RW Operating?"

	CCW Pumps Operating	RW Pumps Operating	RCP CCW HCV-438 Valves
A. ✔	1	1	Open
B.	1	1	Closed
C.	0	2	Open
D.	2	2	Closed

GENERIC 2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.

K/A fit: This question is asking the applicant to identify the correct parameters (number of pumps and heat exchangers) that are required to meet the Maintenance of Vital Auxiliaries Safety Function for core cooling.

RO 4.0 10 CFR 55.41 (b) (7) RO level because it is a memory item for requirements for core cooling design for SPTAs.

LP 7-18-13 EO 1.7 Given a copy of the Safety Function Status Checklist and a set of plant conditions, determine whether or not each Safety Function meets its acceptance criteria.

Justification for Distractors

A. Correct, because, only one CCW pump and one RW pump is required, and the HCV-438 valves would be open.

B. Plausible, because this is the correct number of pumps, and the setpoint for ensuring the valves are closed is $\geq$ 50 psig. Incorrect, because the valves should be open in this condition (no CIAS present).

C. Plausible, because the Raw Water Pumps can be used as backup for CCW loads. Incorrect, because this does not meet the requirements for the SPTAs and would have to be done under a loss of CCW in AOP-11.

D. Plausible, because 2 CCW and 2 RW pumps are required for a LOCA and UHE. Incorrect, because only one of each pump is required.

References

EOP-00, Standard Post Trip Actions
EOP-03, Loss of Coolant Accident
EOP-04, Steam Generator Tube Rupture

Cog Level - LOW memory

New

Validators LOD 3.0

Rev 1

KA#:	000000 2.4.21	Bank Ref #:	
LP# / Objective:	7-18-13 01.07	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	EOP-00	Handout:	

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

(1)QUESTION NUMBER: 075

Given the following condition:

- CCW Discharge Pressure is 50 psig

Which of the following meets the EOP-00, Standard Post Trip Actions, Maintenance of Vital Auxiliaries Safety Function for “CCW and RW Operating?”

	CCW Pumps Operating	RW Pumps Operating	RCP CCW HCV-438 Valves
A.✔	1	1	Open
B.	1	1	Closed
C.	0	2	Open
D.	2	2	Closed

GENERIC 2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.

K/A fit: This question is asking the applicant to identify the correct parameters (number of pumps and heat exchangers) that are required to meet the Maintenance of Vital Auxiliaries Safety Function for core cooling.

RO 4.0 10 CFR 55.41 (b) (7) RO level because it is a memory item for requirements for core cooling design for SPTAs.

LP 7-18-13 EO 1.7 Given a copy of the Safety Function Status Checklist and a set of plant conditions, determine whether or not each Safety Function meets its acceptance criteria.

Justification for Distractors

A. Correct, because, only one CCW pump and one RW pump is required, and the HCV-438 valves would be open.

B. Plausible, because this is the correct number of pumps, and the setpoint for ensuring the valves are closed is $\geq$ 50 psig. Incorrect, because the valves should be open in this condition (no CIAS present).

C. Plausible, because the Raw Water Pumps can be used as backup for CCW loads. Incorrect, because this does not meet the requirements for the SPTAs and would have to be done under a loss of CCW in AOP-11.

D. Plausible, because 2 CCW and 2 RW pumps are required for a LOCA and UHE. Incorrect, because only one of each pump is required.

References

EOP-00, Standard Post Trip Actions
EOP-03, Loss of Coolant Accident
EOP-04, Steam Generator Tube Rupture

Cog Level - LOW memory

New

Validators LOD 3.0

Rev 1

KA#:	000000 2.4.21	Bank Ref #:	
LP# / Objective:	7-18-13 01.07	Exam Level:	RO
Cognitive Level:	LOW	Source:	NEW
Reference:	EOP-00	Handout:	

(2)QUESTION NUMBER: 076

A reactor trip occurred when breaker 1A33 tripped open.

At the conclusion of EOP-00, Standard Post Trip Actions, the following plant conditions exist:

- Pressurizer Level 10% and rising
- Pressurizer Pressure 1100 psia and rising
- Containment Pressure 5.8 psig and rising
- Containment Area Radiation Monitors Rising
- Steam Generator RC-2A/B Pressures 900 psia and constant
- Steam Generator RC-2A/B Levels 38% Narrow Range and rising
- Blowdown Radiation Monitor RM-054A 100 CPM
- Blowdown Radiation Monitor RM-054B 220 CPM
- Reactor Coolant Pumps RC-3B/3D Running
- Reactor Coolant Pumps RC-3A/3C Stopped
- Lockout 86/1A3-TFB Tripped

In accordance with FCS procedures, which of the following actions are directed by the CRS to address the conditions above?

A. Enter EOP-03, Loss of Coolant Accident, and direct restoration of power to Bus 1A3 per Attachment MVA-13, Restoring Off-Site Power to Bus 1A3.

B. ✔ Enter EOP-03, Loss of Coolant Accident, and Ensure SI flow is acceptable per Attachment IC-13, Safety Injection Flow vs. Pressurizer Pressure.

C. Enter EOP-04, Steam Generator Tube Rupture and direct restoration of power to Bus 1A3 per Attachment MVA-13, Restoring Off-Site Power to Bus 1A3.

D. Enter EOP-04, Steam Generator Tube Rupture and Ensure SI flow is acceptable per Attachment IC-13, Safety Injection Flow vs. Pressurizer Pressure.

009 Small Break LOCA/3 2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

This is a small break because pressurizer pressure is greater than steam generator pressure and pressurizer level is rising.

CFR 55.43 (b)(5) SRO 4.7

LP 7-18-13 EO 1.2 STATE from memory four of the eight Entry Conditions for EOP-03, LOCA.

Justification for distracters:

A. Plausible because RC-3A would have been tripped at <1350 psia by the ATCO as a contingency for RCS Pressure control. This may lead the operator to choose this response. Not correct because, RC-3C is not running because vital bus 1A3 is de-energized as a result of a fault (86/1A3-TFB),

B. This is the correct response because inventory is being lost from the primary into containment as indicated by rising area radiation monitors and containment pressure. The CRS must determine this course of action and procedure using the Diagnostics from EOP-00, and after transitioning to EOP-03 must Ensure SI flow is acceptable (Att. IC-13).

C. EOP-04 is plausible since RM-054B reads higher than A and low pressurizer pressure and level are also indiciative of a SGTR; however, RM-054B normally reads higher than A in this range. In addition, 1A3 is faulted as indicated by the tripped 86/1A3-TFB relay. The levels given for the blowdown monitors is normal operating condition.

D. Plausible because "Ensure SI Flow is acceptable" is a step in EOP-04, but it is not the correct procedure per the diagnostics given the conditions listed.

References
EOP-00 Diagnostics
EOP-03
EOP-04
Attachment IC-13

Cog Level - High

Question - New

Validators LOD 2.5

Rev - 1

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	000009 2.1.7	Bank Ref #:	76
LP# / Objective:	07-18-13 01.02	Exam Level:	SRO
Cognitive Level:	HIGH	Source:	NEW
Reference:	EOP-00	Handout:	

(3)QUESTION NUMBER: 077

After a transient from 100% power, the following conditions exist:

- All charging pumps are in Pull-To-Lock and isolated due to a leak on the common suction line.
- A valid automatic reactor trip signal was generated when a steam line rupture occurred.
- All attempts to insert control rods during the EOP-00, Standard Post Trip Actions have failed.
- Breakers CB-AB and CB-CD are open.
- At Cabinet AI-3 Clutch Power Supply Output Currents = 0.0 Amps
- At Cabinet AI-3 All four M Contactor Voltages = 0.0 volts
- The CRS has entered Diagnostics section of EOP-00.
- Reactor Power is 10^{-3}%.

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Which of the following procedures are implemented to address the conditions above?

A. AOP-33, CVCS Leak, Attachment D, RCS Makeup Using HPSI Pumps.

B. EOP-20, Functional Recovery, Success Path CEA Insertion: RC-1.

C. EOP-20, Functional Recovery, Success Path Boration Using CVCS: RC-2.

D. ✔ EOP-20, Functional Recovery, Success Path Boration Using SI: RC-3.

EPE: 007 Reactor Trip Ability to determine or interpret the following as they apply to a reactor trip: EA2.02 Proper actions to be taken if the automatic safety functions have not taken place.

CFR 55.43(b) (5) SRO 4.6

LP 7-18-18 EO 1.6 EXPLAIN how the Resource Assessment Trees are used in terms of Safety Function priority and success path priority within each tree.

Justification for distracters:

A. Plausible, because AOP-33, CVCS Leak, Attachment D, RCS Makeup Using HPSI Pumps. This is the correct flow path to use; **however, once the reactor is tripped EOP-00 Diagnostics will direct the CRS to use EOP-20.**
B. EOP-20, Functional Recovery, Success Path CEA Insertion: RC-1. If the operator was to blindly comply with EOP-20, there are still two steps to take in removing power to the CEDM clutches; however, since CB-AB and CB-CD are open, the steps to open the breakers from the instrument buses and the individual rod drop switches are useless.
C. EOP-20, Functional Recovery, Success Path Boration Using CVCS: RC-2. This section has steps to drive rods into the core, but with the clutch power supply breakers open, this is not an option. All other steps in this section require the charging pumps to be lined up.
D. Correct, EOP-20, Functional Recovery, Success Path Boration Using SI: RC-3. The only way to emergency borate is to de-pressurize and use the HPSI pumps. This is the only section where these steps are listed.

References
OPD-4-9 EOP/AOP Users Guide.
EOP-20 Resource Tree for Reactivity Control
AOP-33, CVCS Leak, Attachment D, RCS Makeup Using HPSI Pumps.
EOP-20, Functional Recovery, Success Path CEA Insertion: RC-1.
EOP-20, Functional Recovery, Success Path Boration Using CVCS: RC-2.
EOP-20, Functional Recovery, Success Path Boration Using SI: RC-3.
Lesson Plan

Cog Level – High

NEW

Validators LOD 3.5

Rev 1

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	000007 EA2.02	Bank Ref #:	77
LP# / Objective:	07-18-18 01.06	Exam Level:	SRO
Cognitive Level:	HIGH	Source:	NEW
Reference:	OPD-4-9	Handout:	

(4)QUESTION NUMBER: 078

A reactor trip occurred. Standard Post Trip Actions are complete. The following conditions are noted:

- Containment Pressure 0.05 psig and stable
- Fast Transfer Successful
- Feedwater Pump FW-4A Supplying S/Gs via Main Feed Ring
- Feedwater Pump FW-4B Off
- Feedwater Pump FW-4C Out of service
- Blowdown Rad Monitor RM-054A 100 cpm
- Blowdown Rad Monitor RM-054B 490 cpm rising
- Condenser Off-Gas Monitor RM-057 1250 cpm rising
- RCS Pressure 1610 psia LOWERING RAPIDLY
- Pressurizer Level 28% and lowering
- RC-2A/B Pressure 925 psia and stable
- CNTMT Area Post Accident monitors RM-091A/B < 1 R/Hr

Based on the above conditions,

1) What EOP must the CRS enter upon completion of EOP-00, Standard Post Trip Actions, and

2) Which EOP/AOP Attachment does the CRS direct the Balance of Plant Operator (BOPO) to use to feed the steam generator(s) during the cool down phase?

	Directed EOP	Feed with Attachment
A.	EOP-03, Loss of Coolant Accident	HR-15 Main Feed Pump Operation
B.	EOP-03, Loss of Coolant Accident	HR-17, FW-6/FW-10 Operation
C.	EOP-04, Steam Generator Tube Rupture	HR-15 Main Feed Pump Operation
D. ✔	EOP-04, Steam Generator Tube Rupture	HR-17, FW-6/FW-10 Operation

038 Steam Generator Tube Rupture/3 EA2 Ability to determine or interpret the following as they apply to a SGTR: EA2.07 Plant conditions, from survey of control room indications.

10 CFR 55.43 (b) (5) SRO 4.8

LP 7-18-14 EO 1.2 STATE from memory four of the seven Entry Conditions for EOP-04, SGTR.

Justification of Distractors

A and B are plausible because a LOCA and Tube Rupture both result in a loss of inventory events. **The differentiation is the blow down radiation monitor indications.** Both are incorrect because, as the RCS depressurization occurs Pressurizer Pressure Low Signal (PPLS) will occur at 1600 psia which produces a Safety Injection Actuation Signal (SIAS). The "A" Feedwater Pump will trip on SIAS and another method of feed will need to be initiated. FW-6 would be the only choice because a PPLS also generates a Containment Isolation Actuation Signal (CIAS) which generates a Steam Generator Isolation Signal (SGIS) and isolates the main feedring flowpath.

Therefore, the only correct answer is D with FW-6 feeding through the Auxiliary Feed nozzels. Step 13 of EOP-00 has the BOPO take the 43-FW switch to the OFF position preventing an auto start of a feedwater pump. It is not prudent to use the Steam Driven Auxiliary Feedwater Pump, FW-10 due to the tube rupture, However, the steps to use it are in the same attachment.

References
AOP-23 Reset of Engineered Safeguards
EOP-00, Standard Post Trip Actions
EOP-03, Loss of Coolant Accident
EOP-04, Steam Generator Tube Rupture
EOP/AOP Attachments-HR 15 and 17 Heat Removal

Cog Level - High

new

Validators LOD 3.5

Rev 2

KA#:	000038 EA2.07	Bank Ref #:	78
LP# / Objective:	07-18-14 01.02	Exam Level:	SRO
Cognitive Level:	HIGH	Source:	NEW
Reference:		Handout:	

(5) QUESTION NUMBER: 079

The plant was at 100% power when a reactor trip occurred.

- Emergency Diesel Generator D-1 is running.
- Emergency Diesel Generator D-2 is out of service.
- EOP-00, Standard Post Trip Actions and contingencies have been completed up to the diagnostic actions.
- Plant Status provided on attached ERF screen PAGE 194 - STATUS BOARD

To address the conditions above:

1. Which EOP is entered, and
2. Which Attachment is used to isolate the affected steam generator?

	EOP	Attachment
A. ✔	EOP-05, Uncontrolled Heat Extraction	Attachment HR-19, Isolate/Restore Steam Generator "A"
B.	EOP-05, Uncontrolled Heat Extraction	Attachment HR-20, Isolate/Restore Steam Generator "B"
C.	EOP-06, Loss of Feedwater	Attachment HR-19, Isolate/Restore Steam Generator "A"
D.	EOP-06, Loss of Feedwater	Attachment HR-20, Isolate/Restore Steam Generator "B"

056 Loss of Off-Site Power/6 2.1.19 Ability to use plant computers to evaluate system or component status.

10 CFR 55.43 (b) (5) SRO 3.8

LP 7-18-15 EO 1.2 STATE from memory four of the six Entry Conditions for EOP-05, UHE.

Justification of Distractors

The ERF screen indicates that S/G RC-2A has low level and low pressure indicating a steam line break. Containment pressure indicates the break is outside containment and unisolable. The CRS is in diagnostics and must determine that EOP-05 is the correct procedure to transition.

A. Correct answer – a UHE is in progress and RC-2A is the affected steam generator.

B. Plausible becaue it is the Correct EOP, but isolating the wrong steam generator.

C/D Plausible because, Diagnostics take the CRS throught the block for loss of feedwater, which is terminated automatically by safeguards actuation and cannot be reinstated until the affected steam generator is isolated. Therefore, the candidate may incorrectly choose this EOP based on seeing no auxiliary and no main feedwater flow.

References
EOP-00 Diagnostics note page 39.
EOP-05 step 16.
EOP-06 sep 7.

Cog Level - High

NEW

Validators LOD 3.0

Rev 1

KA#:	000056 2.1.19	Bank Ref #:	79
LP# / Objective:	07-18-15 01.02	Exam Level:	SRO
Cognitive Level:	HIGH	Source:	NEW
Reference:	EOP-00	Handout:	YES

(6)QUESTION NUMBER: 080

A reactor trip occurred from 100% power

- All off-site power was lost.
- FW-54 Diesel AFW Pump is out of service.
- Both Emergency Diesel Generators failed to start.
- All EOP-00, Standard Post Trip Actions have been completed.
- All 4160 VAC Buses indicate 0 Volts.
- DC Bus 1 red light on CB-20 is ON.
- DC Bus 2 red light on CB-20 is OFF.
- Steam Generator RC-2A is 45% Wide Range and lowering.
- Steam Generator RC-2B is 31% Wide Range and lowering.
- Auxiliary Feedwater Flow is 0 gpm.

Based on the above conditions, what procedural guidance will the CRS use to direct the Balance of Plant Operator (BOPO) to establish Auxiliary Feedwater **remotely**?

A. OI-EE-3, 125 VDC System Normal Operation, Attachment 2, 125 V DC Battery Charger Number 2 Operation.

B. OI-EE-3, 125 VDC System Normal Operation, Attachment 5, Manual Transfer of DC Control Power.

C✔ EOP-20, Functional Recovery, Maintenance of Vital Auxiliaries - DC

D. EOP-20, Functional Recovery, EOP/AOP Attachment MVA-24, Minimizing DC Loads.

058 Loss of DC Power Ability to determine and interpret the following as they apply to the Loss of DC Power: AA2.03 DC loads lost; impact on ability to operate and monitor plant systems.

CFR 55.43(b) (5) SRO 3.9

LP 7-13-4 EO 1.3 LIST the primary (preferred) and alternate (if any) power supplies to each bus/component.

Justification for distracters:
Presented is a scenario in which the only Feedwater Pump available is the steam driven Auxiliary Feed water Pump FW-10 due to a site blackout. The scenario is compounded by loss of DC bus 2 which provides power for the FW-10 aux oil pump, which provides oil pressure to open the governor valve to the turbine for FW-10. Loss of DC is a direct entry to EOP-20. However, Operating Instructions can still be used even when in EOPs and in some cases are directed by the EOPs. For instance, in EOP-20 IC-2 the operator is directed to use OI-CH-4, chemical and Volume Control System Makeup Operations to add inventory to the RCS.

A. Plausible because the OI-EE-3, 125 VDC System Normal Operation, Attachment

3 - EE-8E, 125 V DC Battery Charger Number 3 Operation contains steps to supply power to DC Bus 2. Not correct because recovery from loss of DC is directed from EOP-20 following a plant trip.

B. OI-EE-3, Attachment 5, Manual Transfer of DC Control Power is plausible because it contains steps to swap DC control power for the Steam Driven Auxiliary Feedwater Pump, FW-10 Auxiliary Lube Oil Pump, normally powered by DC Bus 2, by using the transfer switch at AI-179. However, the Operating Instruction would not be appropriate in this situation for the same reason as A.

C. EOP-20, Functional Recovery, is the correct procedure to use because you are in a post trip condition with two events in progress and section MVA-DC has the step to use for transferring DC control power to DC Bus #1 with the switch at AI-179. Although, an operator could go directly to FW-10 and use a crow bar to lift up the poppit to allow steam to th FW-10 turbine, it is not remotely and would take longer; therefore,remotely is preferrable.

D. EOP-20, Functional Recovery, EOP/AOP Attachment MVA-24, Minimizing DC Loads is plausible because this attachment is an actual step performed on loss of a DC bus or its respective charger; however, it does not have steps for recovery of the bus.

References
EOP-00, Reactor Trip procedure Diagnostics
OI-EE-3, Attachment 5, Manual Transfer of DC Control Power
EOP-20, Functional Recovery, Section MVA-DC Step 42.e

Cog Level - High

Validators LOD 3.0

Rev 1

KA#:	000058 AA2.03	Bank Ref #:	80
LP# / Objective:	7-13-4 01.03	Exam Level:	SRO
Cognitive Level:	HIGH	Source:	NEW
Reference:	EOP-20	Handout:	

(7)QUESTION NUMBER: 081

The plant was operating at full power, when the following sequence of events occurred:

- The reactor tripped on Low Pressurizer Pressure.
- Containment Area Radiation Monitors are rising.
- Standard Post Trip Actions are completed.
- Bearing water pump, AC-9A is running.
- A coincident loss of instrument air pressure occurred.
- Instrument air pressure is 10 psig and lowering.
- 45 minutes into the event the "SIRWT TANK Level HI-LO" alarm was received.
- 2 Air compressors are running and indicating a current of 200 amps each
- SIRWT Level indicates 10" and lowering.
- STLS has not actuated

What action should be taken NEXT in response to these indications.

A. ✔ ENTER EOP-03,"Loss of Coolant Accident" then IMPLEMENT AOP-17, "Loss of Instrument Air" and continue to attempt to restore instrument Air Pressure.

B. ENTER EOP-03,"Loss of Coolant Accident" then open both Containment Sump Suction Valves, HCV-383-3 and HCV-383-4, and close both SIRWT suction valves LCV-383-1 and LCV-383-2.

C. GO TO AOP-17, "Loss of Instrument Air" and continue to attempt to restore instrument Air Pressure.

D. ENTER EOP-20, IC-2 then open both Containment Sump Suction Valves, HCV-383-3 and HCV-383-4, and close both SIRWT suction valves LCV-383-1 and LCV-383-2.

APE: 065 Loss of Instrument Air. AA2. Ability to determine and interpret the following as they apply to the Loss of Instrument Air: AA2.08 Failure modes of air-operated equipment.

K/A fit: This requires the applicant to determine the failure mode of equipment affected by a loss of instrument air during an abnormal condition.

SRO 3.3 10 CFR 55.43 (b) (5) This question requires the applicant to select a procedure and the appropriate steps to mitigate an abnormal situation.

LP 7-17-17 EO 1.2 Describe how the plant responds to a loss of instrument air in terms of how specific equipment is affected and how it affects overall plant operation and reliability.

Justification of Distractors

A. Correct, because a LOCA is present and IMPLEMENT AOP-17 is correct.

B. Plausible, becasue a LOCA is present, and with a low SIRWT level RAS would be expected. Incorrect, because, IAW AOP-17 the RAS instrumentation would not be affected because it has accumulators. The SIRWT indication is erroneous due to the loss of instrument air.

C. Plausible, because the corrective actions are directed in AOP-17, but not until you enter EOP-03, then you would IMPLEMENT AOP-17.

D. Plausible, EOP-20 is the correct procedure to enter and manually realigning the valve would be appropriate if the SIRWT level were actually low and STLS was met,but did not occur. Incorrect, because STLS conditions have not been met.

References

OPD-4-9 EOP/AOP Users Guide
EOP-00 Standard Post Trip Actions
EOP-20 Functional Recovery Procedure

Cog level - High The applicant is being asked interpret a set of conditions to determine the correct procedure to use and then pick another procedure to implement.

New

Validators LOD 3.0

Rev 1

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	000065 AA2.08	Bank Ref #:	81
LP# / Objective:	7-17-17 01.02	Exam Level:	SRO
Cognitive Level:	HIGH	Source:	NEW
Reference:	OPD-4-9	Handout:	

(8)QUESTION NUMBER: 082

Given the following:

- A major transient occurred, resulting in an automatic reactor trip and PPLS.
- EOP-3, Loss of Coolant Accident, has been entered.
- RCS pressure is 1550 PSIA and lowering slowly.
- RCS Tcold is 528°F and stable.

Ten minutes later, the following conditions are observed:

- Steam Generator RC-2A pressure is 450 PSIA and lowering.
- Steam Generator RC-2B pressure is 750 PSIA and lowering
- RCS Tcold is 440°F of and lowering.
- RCS pressure is 1350 PSIA and lowering.

In response to these conditions the Control Room Supervisor will_____.

A. Remain in EOP-3, Loss of Coolant Accident. IMPLEMENT EOP-5, Excess Steam Demand Event, for actions required to isolate RC-2A and terminate the RCS cool down.

B. ENTER EOP-5, Excess Steam Demand Event, and isolate RC-2A and stabilize RCS temperature.

C. ENTER EOP-20, Functional Recovery Procedure, and isolate RC-2A by use of the appropriate RCS Pressure Control Success Path.

D. ✔ ENTER EOP-20, Functional Recovery Procedure, and isolate RC-2A by use of the appropriate RCS Heat Removal Success Path.

E09 Functional Recovery; EA2.2 Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

K/A fit: The question requires knowledge of the optimal EOPs as well as the requirements to transition to the functional EOP when conditions require it. In this case a second event occurs.

10 CFR 55.43 (b) (5) SRO 4.0 SRO level because the applicant is asked to decide what EOP to transition to after the original set of conditions change.

LP 7-18-18 EO 1.4 Describe the overall strategy of EOP-20.

Justification of Distractors

A. Plausible, because both of these event are in progress. Incorrect - Conditions stated (multiple events in progress) are entry criteria for the Functional Recovery Procedure which will correctly assess and prioritize actions to address jeopardized safety functions. EOP-20 will provide the actions required to address both the LOCA and the ESDE.

B. Plausible, EOP-05 will address the new set of conditions. Incorrect - Conditions stated (multiple events in progress) are entry criteria for the Functional Recovery Procedure which will correctly assess and prioritize actions to address jeopardized safety functions. Transitioning to EOP-5 will not address the inprogress LOCA.

C. Plausible, EOP-20 is the correct procedure to transition to. Incorrect - The appropriate RCS Heat Removal success path will provide direction for this event (HR-3).

D. Correct - Conditions stated (multiple events in progress) are entry criteria for the Functional Recovery Procedure which will correctly assess and prioritize actions to address jeopardized safety functions. The appropriate RCS Heat Removal success path will provide direction for this event (HR-3).

References

OPD-4-9 EOP/AOP Users Guide
EOP-03 Loss of Coolant Accident
EOP-20 Functional Recovery

Cog level - High The applicant is required to analyze a new set of conditions and apply EOP knowledge to determine what EOP to use to mitigate the events taking place.

Bank 2010 Calvert Cliffs Exam

Validators LOD 3.0

Rev 0

KA#:	000028 EA2.2	Bank Ref #:	82
LP# / Objective:	7-18-18 01.04	Exam Level:	SRO
Cognitive Level:	HIGH	Source:	2010 CALVERT CLIFFS
Reference:	EOP-03	Handout:	

(9)QUESTION NUMBER: 083

A new fuel bundle has dropped off the FH-1 Refueling Machine grapple onto the refueling cavity floor and appears to be damaged. The following conditions exist:

- The inner PAL door is being held open by an RP tech for trash removal.
- The outer PAL door is open and inoperable.
- The Equipment Hatch is installed.
- All Area and Process Monitors indicate normal background radiation.

1) Which AOP does the CRS enter, **and**
2) What is an action the operators are directed to perform?

	Procedure	Action
A.	AOP-08 Fuel Handling Incident	Trip VIAS using both CRHS test switches
B.✔	AOP-08 Fuel Handling Incident	Direct the EONA to close the inner PAL door within 1 hour
C.	AOP-12 Loss of Containment Integrity	Trip VIAS using both CRHS test switches
D.	AOP-12 Loss of Containment Integrity	Direct the EONA to close the inner PAL door within 1 hour

AA2. Ability to determine and interpret the following as they apply to the Fuel Handling Incidents: AA2.02 Occurrence of a fuel handling incident.

Meets K/A because the SRO applicant must distinguish this as a fuel handling incident and not a loss of containment integrity, and direct a specific action in the procedure.

CFR 55.43(b) (5) SRO 4.1

LP 7-17-08 EO 1.4 DESCRIBE the entry conditions for this AOP.

Justification for Distractors

A. Plausible because, a damaged fuel assembly is an entry condition for AOP-08; however, AOP-08 directs VIAS if the incident was in the Auxiliary Building. Therefore, this is incorrect because it is in the containment. The candidate must understand that a new fuel element will not have any Noble gas to cause VIAS.

B. The entry condition for AOP-08 includes, "Possible damage to Fuel Assembly is observed." Actions require closing the PAL door in one hour.

C. Plausible since VIAS would close valves that may be open to the enviornment from the Containment; however, Containment Integrity does not apply when in mode 5, as such, AOP-12 does not apply.

D. Plausible since an entry condition for AOP-12 is, "Neither Personnel Air Lock Door is properly sealed," which this condition would meet if in modes 1,2, or 3. Since Containment Integrity does not apply when in mode 5 AOP-12 does not apply.

References
AOP-08 Fuel Handling Incident
AOP-12 Loss of Containment Integrity

Cog Level - High

new

Validators LOD 2.0

Rev 1

KA#:	000036 AA2.02	Bank Ref #:	83
LP# / Objective:	07-17-08 01.04	Exam Level:	SRO
Cognitive Level:	HIGH	Source:	NEW
Reference:		Handout:	

(10) QUESTION NUMBER: 084

With the reactor at 100% power **BOTH** Narrow Range Containment Sump Level instruments, LT-599 and LT-600, have been declared inoperable as a result of failed power supplies.

- The Containment Dew Point Instrument, Y-861, is operable.
- RM-052 Stack/CNTMT Gas Monitor is Out of Service.
- RM-050 and RM-051, CNTMT Particulate and Gas is Operating and aligned to Containment.

What action(s) must be taken for the conditions above?

A. Perform periodic Samples of the Containment Atmosphere for Radioactivity within 12 hours.

B. Restore a Containment Sump Level instrument to operable status within 7 days.

C. ✔ Restore a Containment Sump Level instrument to operable status within 30 days.

D. Operation may continue until the next cold shutdown, and then restore the sump level instruments to operable status.

CE/A16 Excess RCS Leakage 2.2 Equipment Control 2.2.36 Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operation.

Meets the K/A because loss of a power supply affects instruments used to monitor leakage from containment, which are covered by Technical Specifications. SRO level because, it requires knowledge of the LCO actions greater than 1 hour.

CFR 55.43. (b) (2) SRO 4.2.

LP 7-11-20 EO 4.5 Given a current copy of the Technical Specifications, EXPLAIN the Technical Specifications and bases applicable to the RCS Instrumentation.

Handout: Page 2.1-13, 2.1.4 Reactor Coolant System Leakage Limits with time limits blacked out.

Justification for distracters:

A. Plausible because the ODCM allows periodic sampling for other processes when a required radiation monitor is out of service, but the ODCM does not address this instrument.

B. Plausible, because 7 days is a standard LCO time to restore a safety related piece of equipment.

C. TS 2.1.4 (4) a. allows 30 days to restore one of these instruments to service.

D. Plausible because TS 2.21 identifies this same instrument for post-accident monitoring; however, TS 2.1.4 has a shorter required action time because of this instruments requirement to detect leak-before-break.

References
Technical Specifications 2.1.4 (4)
TS 2.21 Table 2-10 note (d)

Cog Level - High

New

Validators LOD 2.5

Rev 1

KA#:	CE-A16 2.2.36	Bank Ref #:	84
LP# / Objective:	07-11-20 04.05	Exam Level:	SRO
Cognitive Level:	LOW	Source:	NEW
Reference:	TECH SPEC 2.1.4(4)	Handout:	TS 2.1.4 BLACKOUT

(11) QUESTION NUMBER: 085

The Plant was at 70% power when it experienced an event. EOP-00, Standard Post Trip Actions are completed. The following conditions exist:

- Steam Generator RC-2A is 5% NR level and lowering.
- Steam Generator RC-2B is 35% NR level and stable.
- Steam Generator RC-2A is 300 psia and lowering.
- Steam Generator RC-2B is 750 psia and stable.
- RCS Pressure is 1200 psia and lowering.
- Pressurizer Level is 0%

Given these conditions,

1) What action will the CRS will direct the operators to perform, and
2) What is the reason for the action?

	Action	Reason
A.	Open Air Assisted Safety Valve MS-291 for Steam Generator RC-2A	Minimize potential for pressurized thermal shock.
B.	Open Air Assisted Safety Valve MS-291 for Steam Generator RC-2A	Raise the cooldown rate to meet Shutdown Cooling entry conditions
C. ✔	Open Air Assisted Safety Valve MS-292 for Steam Generator RC-2B	Minimize potential for pressurized thermal shock.
D.	Open Air Assisted Safety Valve MS-292 for Steam Generator RC-2B	Raise the cooldown rate to meet Shutdown Cooling entry conditions

CE/A11 RCS Overcooling – PTS/4 2.4.18 Knowledge of the specific bases for EOP.

(CFR: 43.(b)(2)SRO 4.0.

LP 7-18-15 EO 1.1 EXPLAIN the major strategy used to mitigate the consequences of an UHE.

Justification of Distractors

A. Plausible because the reason for steaming is correct, however it is the wrong steam generator.

B. Plausible because EOP-05 step 40 will direct the operator to cool down to SDC entry conditions, incorrect because this is the wrong steam generator to steam.

C. EOP-05 directs the operator to steam the least affected steam generator, which is RC-2B; therefore, MS-292 should be used. Since the affected steam generator is below 500 psia, the MSIVs are closed and HCV-1040 and the SD&BS system are not available. Per the bases for EOP-05, Uncontrolled Heat Extraction, PTS on the vessel is the main issue. Therefore, this is the only correct answer.

D. Plausible because EOP-05 step 40 will direct the operator to cool down to SDC entry conditions, incorrect because the conditions are met to steam the unaffected steam generator, which must be done before considering establishing SDC.

References
EOP-05 step 19.1
TDB-EOP-05 page 36 of 81

Cog level - High

New

Validators LOD 2.0

Rev 1

KA#:	CE-A11 2.4.18	Bank Ref #:	85
LP# / Objective:	07-18-15 01.01	Exam Level:	SRO
Cognitive Level:	HIGH	Source:	NEW
Reference:	EOP-05	Handout:	

(12) QUESTION NUMBER: 086

The plant is in Mode 5 with Shutdown Cooling (SDC) in service.

- LPSI Pump SI-1A is running.
- The Pressurizer Manway is installed.
- The 120 VAC power supply fuse to pressure transmitter PT-118 has opened.

1) In this condition, what is the correct AOP for the CRS to enter, and
2) What action is directed to restore SDC?

	AOP	Action
A.	AOP-16, Loss of Instrument Bus Power	Locally throttle HCV-341, "SHUTDOWN CLG HT EXCHS AC-4A/B OUTLET TEMPERATURE CONTROL VALVE
B.	AOP-16, Loss of Instrument Bus Power	Place HC-347/348, "PZR PRESS PC-118A AUTO SIG OVERRIDE SW HC-347/348", in "OVERRIDE".
C.	AOP-19, Loss of Shutdown Cooling	Locally throttle HCV-341, "SHUTDOWN CLG HT EXCHS AC-4A/B OUTLET TEMPERATURE CONTROL VALVE
D. ✔	AOP-19, Loss of Shutdown Cooling	Place HC-347/348, "PZR PRESS PC-118A AUTO SIG OVERRIDE SW HC-347/348", in "OVERRIDE".

SYSTEM: 005 Residual Heat Removal System (RHRS) A2 Ability to (a) predict the impacts of the following malfunctions or operations on the RHRS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A2.01 Failure modes for pressure, flow, pump motor amps, motor temperature, and tank level instrumentation.

CFR 55.43 (b) (5) SRO 2.9*

LP 7-17-16 EO 1.2 DESCRIBE how the plant responds to a loss of instrument bus power in terms of how specific equipment is affected and how it affects overall plant operation and reliability.

Justification of Distractors

A. Plausible because AOP-16 could be considered on loss of 120 VAC power, but not for a single power supply, and the step to Locally throttle HCV-341 is in AOP-16.
B. Plausible because AOP-16 could be considered on loss of 120 VAC power, but not for a single power supply. In addition, this step is specifically stated in this procedure and would restore SDC.
C. Plausible because Entry conditions for AOP-19 are met, and it contains the step to locally throttle HCV-341;however, it is not necessary unless control power to HCV-341 has been lost.
D. Correct because Entry conditions for AOP-19 are met and the step to ensure HCV347/348 are open, implies the PC-118A AUTO SIG OVERRIDE SW can be used to open the valves. In addition, the ARP for CB-1/2/3 A2 Window C-1L "SHUTDOWN COOLING VALVES CLOSED SIG FAIL OR VIOLATION" directs the operator to AOP-19.

References
AOP-19 Entry Conditons
ARP CB-1/2/3 Window C-1L
AOP-16, Loss of Instrument Bus Power step 8.1
AOP-19, Loss of Shutdown step 22

Cog level - High

New

Validators LOD 2.0

Rev 1

KA#:	005000 A2.01	Bank Ref #:	86
LP# / Objective:	07-17-16 01.02	Exam Level:	SRO
Cognitive Level:	HIGH	Source:	NEW
Reference:	AOP-19	Handout:	

(13) QUESTION NUMBER: 087

What procedure and method is used to form a steam bubble in the pressurizer following a refueling outage?

A. ✔ OP-2A, "Plant Startup," With the pressurizer level at approximately 50%, pressurizer heaters are used to heat the water to saturation. Non-condensible gases are vented to the PQT or VCT.

B. OP-2A, Plant Startup," The pressurizer is filled as non-condensible gases are vented to the PQT. With the pressurizer solid, the pressurizer heaters are used heat the water in the pressurizer. The pressurizer level is then lowered until a steam bubble forms.

C. OI-RC-2A, "RCS Fill and Drain Operations," With the pressurizer level at approximately 50%, pressurizer heaters are used to heat the water to saturation. Non-condensible gases are vented to the PQT or VCT.

D. OI-RC-2A, "RCS Fill and Drain Operations," The pressurizer is filled as non-condensible gases are vented to the PQT. With the pressurizer solid, the pressurizer heaters are used heat the water in the pressurizer. The pressurizer level is then lowered until a steam bubble forms.

010 Pressurizer Pressure Control 2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation.

K/A fit: OP-2A requires coordination of several individual operating instructions to allow the plant to startup, and ties individual processes together to allow, for instance, a bubble to be formed in the Pressurizer.

SRO 4.4 10 CFR 55.43 (b) (5)It is the SROs function to direct coordiated actions that result in conditions to allow plant startup, which requires selecting the correct procedure for conducting an evolution.

LP 7-11-20 EO 3.5 List the major steps for starting up the RCS per OP-2A.

Justification of Distractors

A. Correct. OP-2A is used to form a bubble in the pressurizer.

B. Plausible because OP-2A is the correct procedure and this method of drawing a bubble is used in some PWRs. Incorrect, this process is not used at FCS.

C. It is plausible because the procedure is used to establish pressurizer level following an outage, but not to form the bubble. Incorrect, it describes the correct method but OI-RC-2A is not used to form a bubble in the pressurizer.

D. plausible because the method is used to draw a bubble in some PWRs. However, incorrect, OI-RC-2A is not the procedure that is used.

References

OP-2A, Plant Startup

Cog level - Low

Bank 7-11-20 #153

Validators LOD 4.0

Rev 0

KA#:	010000 2.1.23	Bank Ref #:	7-11-20 #153
LP# / Objective:	07-11-20 03.05	Exam Level:	SRO
Cognitive Level:	LOW	Source:	BANK
Reference:	OP-2A	Handout:	

(14) QUESTION NUMBER: 088

Given the following plant conditions:

- The plant is operating at full power.
- A surveillance test is being conducted on Raw Water Pump, AC-10A, using OP-ST-RW-3001, "AC-10A Raw Water Pump Quarterly Inservice Test."
- The river temperature is 58°F.
- Refer to Handout TDB-III.31 AC-10A Pump Curve

What is the required action per Technical Specifications if the pressure differential developed by the pump is 44 psid and the flow is 5,000 gpm?

A. Contact the System Engineer to begin trending pump parameters.

B. Shutdown AC-10A, it may remain operable as a standby pump.

C. ✔ Declare AC-10A inoperable. No other action is required at this time.

D. Declare AC-10A inoperable. AC-10A must be restored to operability within 7 days or else place the reactor in hot shutdown within 12 hours.

013 Engineered Safety Features Actuation System (ESFAS) 2.2.12 Knowledge of surveillance procedures.

KA Fit: The Raw Water Pumps are described as a part of the Engineered Safeguards System in USAR Section 6.1.2.2.f. This question asks the applicant to determine operability based on the limits in TS.

SRO 4.0 CFR 55.43 (B) (2) SRO level because it is asking the applicant to determine the operability of a component and apply a limiting condition of operation.

LP 07-12-14 EO 2.7 Given a current copy of Technical Specifications, EXPLAIN the Limiting Conditions for Operation that apply to the Engineered Safeguards Control System.

Justification of Distractors

A. Plausible and would be correct if the results were in the alert range.

B. Plausible because the pump will still provide flow.

C. Correct. one RW Pump can be inoperable indefinitely with the river temperature below 60°F. The Results per TDB-3-31 place the pump in the Required Action Level making the pump inoperable.

D. Plausible, would be correct if the river temperature was above 60°F.

References

OP-ST-RW-3001
TDB-3-31

Cog level - High the applicant is asked to interpret data from a graph and apply the information to make a judgement on operability.

New

Validators LOD 2.5

Rev 1

KA#:	010000 2.1.12	Bank Ref #:	87
LP# / Objective:	7-12-14 02.07	Exam Level:	SRO
Cognitive Level:	HIGH	Source:	NEW
Reference:	OP-ST-RW-3001	Handout:	TDB-3-31

(15) QUESTION NUMBER: 089

The plant tripped from100% power as a result of rising containment pressure. The following conditions exist:

- Containment Pressure is 27 psig and lowering.
- Containment Cooling and Filtering Unit VA-3A is running.
- Containment Cooling Unit VA-7C is running.
- Diesel Generator D-2 is out of service.
- Containment Spray Pumps SI-3A and SI-3B handswitches are in Pull-to-Lock.
- Containment Spray Flow is 0.0 GPM.
- Containment Spray Valve HCV-344 is closed.
- Containment Spray Valve HCV-345 will **NOT** close remotely from the control room.
- Standard Post Trip Actions are completed.

Given these conditions, what procedure will the CRS use to address the status of the Containment Spray System?

A. EOP-05, Uncontrolled Heat Extraction, Reset CSAS, Containment Spray Actuation Signal.

B. EOP-05, Uncontrolled Heat Extraction, Immediately restart Containment Spray Pump SI-3A.

C. Floating Step F, Containment Spray Termination, Restart Containment Spray Pump SI-3A if Containment rises to 40 psig.

D. ✔ Floating Step F, Containment Spray Termination, Direct the Auxiliary Building Operator to locally close HCV-345 manually.

0026 Containment Spray A2 Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A2.03 Failure of ESF.

CFR: 55.43.(b) (5) SRO 4.4

LP 7-18-15 EO 3.10 GIVEN a copy of the Containment Spray Termination floating step, EXPLAIN the steps necessary to terminate containment spray flow.

Justification for Distractors

A. Resetting CSAS is part of a series of procedurally driven steps, which will restore the system to normal operation but can only be done once containment pressure is below 3 psig. In addition, since HCV-345 cannot be closed remotely, it must be closed locally.

B. Restarting SI-3A will pressurize the containment spray header and eliminate a potential release path; however, the intent is to terminate containment spray as soon as possible to minimize the potential of containment sump strainer plugging.

C. Although procedurally driven, taking no action and waiting until, and if, the containment pressure rises to 40 psig allows a release path to the environment.

D. HCV-345 is an ESF component that has malfunctioned. This step is procedurally driven by Floating Step F, and must be directed by the CRS; therefore, it is the only correct answer. In addition, the candidate must understand that emergency diesel generator D-1 is running

References

AOP/EOP Floating Step F

Cog Level - High

New Question

Validators LOD 3.0

Rev 2

KA#:	026000 A2.03	Bank Ref #:	89
LP# / Objective:	07-18-15 03.10	Exam Level:	SRO
Cognitive Level:	HIGH	Source:	NEW
Reference:	FLOATING STEP F	Handout:	

(16)QUESTION NUMBER: 090

- The plant is at 100% Power.
- Circulating Water Pumps CW-1A and CW-1B are running.
- Monitor Tank WD-22A is being released.
- FC-211, Waste Liquid Tank Release Permit requires one Circulating Water Pump.

What action is required to continue the release if FR-690, Overboard Effluent Liquid Flow Recorder fails?

A. Start CW-1C, Circulating Water Pump.

B. Record the flow rate every four hours.

C. Record the level in WD-22A every four hours

D. Perform a second independent sample of WD-22A.

0073 Process Radiation Monitoring A2 Ability to (a) predict the impacts of the following malfunctions or operations on the PRM system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A2.02 Detector failure.

CFR 55.43 (b) (5) SRO 3.2

LP 19-50-04 EO 2.2 STATE the action to be taken in the event liquid and gaseous effluent instrumentation is not operable.

Justification for Distractors

A. Starting a third circulating water pump will raise the dilution rate, which would appear to be a conservative decision, but it is not necessary to have more circulating water pumps running in accordance with the release permit. In addition this action does not address the ODCM issue.
B. This action is directed from the ODCM upon loss of the flow recorder. The ODCM is the governing document that provides guidance to meet Technical Specifications. It is therefore the only correct answer. It is an SRO task to direct actions to meet the LCO requirements of Technical Specification. The guidance for this is not found in the Operating Instructions used by the Reactor Operators.
C. Recording the level every four hours would allow an operator to calculate the flow rate based on the tank curve, but it is not an allowable method per the ODCM.
D. A second independent sample is one of the requirements for release if liquid effluent monitor RM-055 is out of service. Therefore this may appear to be a valid alternative.

References
CH-ODCM-0001, Off-site Dose Calculation Manual

Cog Level - Low

New Question

Validators LOD 2.0

Rev 1

KA#:	073000 A2.02	Bank Ref #:	90
LP# / Objective:	19-50-04 02.02	Exam Level:	SRO
Cognitive Level:	LOW	Source:	NEW
Reference:	ODCM	Handout:	

(17)QUESTION NUMBER: 091

- The plant is at 100% power.
- Seven days ago multiple CETs suddenly failed.
- All attempts to repair the CETs have been unsuccessful.

Given the attached information from the Emergency Response Facility Computer System (ERFCS) page GRC, CET Temperatures, and Technical Specification Table 2-10, Post-Accident Monitoring Instrumentation Operating Limits (pages 2.21 pages 3 and 4), which of the following actions should be taken?

A. Be in Hot Shutdown in the next 6 hours.

B. Be in Hot Shutdown in the next 12 hours.

C. Initiate an alternate means of subcooled monitoring.

D. ✔ Prepare and submit a special report to the Commission within 30 days.

017 In-Core Temperature Monitor (ITM) System A2 Ability to (a) predict the impacts of the following malfunctions or operations on the ITM system; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: A2.01 Thermocouple open and short circuits.

CFR 55. 43 (B) (5) SRO 3.5

LP 7-53-02 EO 1.8 State the Technical Specifications associated with the ERFCS.

Justification for distracters:
An operable CET is determined by the performance of OP-ST-RX-0003, Core Exit Thermocouple Operability Check. This allows for a band determined by using the lowest Thot and the highest Tcold to determine the upper and lower limits for CETs, an allowable band is typically in the range of 100 to 120 degrees from the highest allowable to the lowest allowable CET valid temperatures. 871 degrees is significantly outside the allowable band as is 32 degrees.

A. Be in Hot Shutdown in the next 6 hours could be chosen if the candidate is not familiar with TS Table 2-21 requirements or references in OP-ST-RX-0003, in this case he may choose a TS Motherhood action statement from 2.0.1.
B. Be in Hot Shutdown in the next 12 hours is the action for one less than the minimum required.
C. Initiate an alternate means of subcooled monitoring is the action for loss of subcooled margin monitors. CETs are used for subcooling during accident conditions when in natural circulation, which does not fit this condition. This TS LCO requirement is specific to CETs, although other subcooled margin monitors are available they are not accurate for natural circulation conditions.
D. Prepare and submit a special report to the Commission within 30 days.

The candidate must review the ERF GRC screen, interpert the indications and determine that Quadrant 1 has less than 4 operable CETs. The candidate must then refer to the TS provided and determine that a 30 day report is required, but the TS of 2 or more is still met. This is complicated by the fact that the CETs are physically part of the incore detector strings.

References
TS 2.21 Post-acident Monitoring Instrumentation 2.21 page 1 - 4.
TS 2.21 Post-acident Monitoring Instrumentation 2.21 pages 3 and 4 will be given as a handout, without highlights.
TS Table 2-10 Post Accident Monitoring Instrumentation Operating Limits.
OP-ST-RX-0003, Core Exit Thermocouple Operability Check.

Cog Level - High

New Question

Validators LOD 3.0

Rev 1

KA#:	000017 A2.01	Bank Ref #:	91
LP# / Objective:	LP 7-53-02 01.08	Exam Level:	SRO
Cognitive Level:	HIGH	Source:	NEW
Reference:	TS 2.21	Handout:	GRC CET/TS 2.21

(18)QUESTION NUMBER: 092

The plant is at 100% Power.

- Primary to Secondary leak rate is 25 gpd.
- A condenser tube leak is suspected.
- The following Steam Generator chemistry conditions exist:

Date/ Time	Sodium (ppm)	Chloride (ppm)	Sulfate (ppm)	I-131 Dose Equivalent (µCi/ml)
5/25/14/ 0900	0.001	0.001	0.001	2.0E-4
5/26/14/ 0900	0.001	0.001	0.001	2.0E-4
5/27/14/ 0900	0.150	0.100	0.090	2.0E-4
5/28/14/ 0900	0.150	0.100	0.090	2.0E-4

Handout: CH-AD-0003 Plant Systems Chemical Limits and Corrective Actions Section 4.4.4 Steam Generator Chemical Limits.

Given the chemistry results above,

1) What, if any, are the impacts on the plant, and
2) What is the highest Mode and/or power level the plant is allowed to be in on 5/28/14 at 0900 hours?

	Impact on the plant	Highest Mode/ Power Level
A.	Direct Shift Chemist to sample at least once per eight hours, **only**.	Mode 1/ 100% power
B.	Direct Shift Chemist to sample at least once per eight hours, **only**.	Mode 1 ≤30% power
C.	Adjust Steam Generator Blowdown **and** Direct the Shift Chemist to Sample once per eight hours.	Mode 1/ 100% power
D. ✔	Adjust Steam Generator Blowdown **and** Direct the Shift Chemist to Sample once per eight hours.	Mode 1 ≤30% power

056 Condensate System A2 Ability to (a) predict the impacts of the following malfunctions or operations on the Condensate System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A2.05 Condenser tube leakage

CFR 55.43 (b) (5) SRO 2.5

LP 7-17-41 EO 1.2 DESCRIBE the entry conditions for this AOP.

Justification for Distractors

Being outside chemistry limits is determined by comparing the chemistry conditions with the table in CH-AD-0003. This is done by an SRO. Both the RO and SRO would know the mitigating strategy necessary that a reduction in power IAW AOP-41 will help improve chemistry conditions. With the contaminants originating from the condensate/condenser system and feeding into the steam steam generators where they are concentrated, a reduction in condensate flow will reduce the rate of buildup of the steam generator contaminates. Knowing the mode and power reduction that must be reached/achieved is SRO level knowledge for the specific condition.

A. Plausible, because it is an action for Action level 1, which allows the plant to remain at power. However, the plant is in Action level 2.

B. Plausible, because this is the required power reduction and recommended action IAW AOP-41 for Action Level 2 conditions, but adjusting blowdown is also required.

C. Plausible, because the actions are consistent for Action Level 1 and 2, but you canot stay at 100% power in Action level 2.

D. This is the required power reduction and recommended action IAW AOP-41 for Action Level 1 and 2 conditions.

References

AOP-41, Chemistry Out of Specifcation
CH-AD-003, Plant Systems Chemical Limits and Corrective Actions

Cog Level -High

New Question

Validators LOD 4.0

Rev 1

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

KA#:	056000 A2.05	Bank Ref #:	92
LP# / Objective:	07-17-41 01.02	Exam Level:	SRO
Cognitive Level:	HIGH	Source:	NEW
Reference:		Handout:	CH-AD-0003

(19)QUESTION NUMBER: 093

- The plant is at 100% power.
- RM-077, Aux. Bldg Elevation 989' Room 4 Area Radiation Monitor is in alarm.
- RM-078, Aux. Bldg Elevation 989' Room 4 Area Radiation Monitor is in alarm.
- RM-062, Aux. Bldg Vent Stack Noble Gas monitor indicates rising counts.
- VCT Level is stable.
- A Containment Pressure Relief (CPR) Release is in progress.
- Spent Regenerate Tank levels are stable.
- Auxiliary Building Sumps are stable.
- The Reactor Engineer is conducting an inventory of the Spent Fuel Pool.

Given these conditions:

1) What procedure does the CRS enter?
2) What is an action that is directed?

	Procedure	Action
A.	AOP-08, Fuel Handling Accident,	Terminate the CPR, per OI-VA-1, Attachment 6 CPR Release FC-212.
B. ✔	AOP-09, High Radioactivity,	Terminate the CPR, per OI-VA-1, Attachment 6 CPR Release FC-212.
C.	AOP-08, Fuel Handling Accident,	Ensure an Auxiliary Building Supply Fan VA-35 A or B is running.
D.	AOP-09, High Radioactivity,	Ensure an Auxiliary Building Supply Fan VA-35 A or B is running.

QUESTIONS REPORT

for 2014 Draft NRC WRITTEN EXAM

072 Area Radiation Monitoring (ARM) System 2.4.4 Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.

CFR: 55.43(b)(5) SRO 4.7

LP 7-17-09 EO 1.4 DESCRIBE the entry conditions for this AOP.

Justification for Distractors

A. AOP-08 has entry conditions for area radiation monitors increase, which makes this distractor credible. However, the area radiation monitors listed are not in areas where spent fuel would be.AOP-08 has steps to Ensure VIAS which will terminate the Containment Pressure Reduction, which makes it plausible, but a spent fuel accident has not occurred. Therefore, this distractor is incorrect.
B. AOP-09 contains the entry conditions for high radioactivity in the auxiliary building, for these area radiation monitors, and there is no indication of a liquid leak, therefore, this procedure is the correct one to terminate the containment pressure reduction. The CPR is initiated by procedure OI-VA-1 Attachment 6 and must be terminated with this procedure.
C. AOP-08 contains the step to ensure a VA-35A or B fan is running a fuel handling incident. This is to ensure adequate flow through the ventilation charcoal filter VA-66, which serves the spent fuel pool area
D. AOP-09 is the correct procedure to enter, but it does not direct the operator to start a supply fans. The concept of filtering the auxiliary building air with a charcoal filter would seem plausible; however, AOP-09 has the operator stop the supply fans and leave an exhaust fan running to minimize air flow.

References:
AOP-08, Fuel Handling Accident
AOP-09, High Radioactivity
AOP-33, CVCS Leak

Cog Level - High

New Question

Validators LOD 2.5

Rev 1

KA#:	072000 2.4.4	Bank Ref #:	93
LP# / Objective:	07-17-09 01.04	Exam Level:	SRO
Cognitive Level:	HIGH	Source:	NEW
Reference:		Handout:	

(20) QUESTION NUMBER: 094

Who can authorize bypassing of Emergency Safeguards (ESF) automatic functions during Emergency Operating Procedure (EOP) events, and what is a restriction that applies?

	Authorization	Restriction
A. ✔	Shift Manager or CRS	Reactor Operators must have control of the process to be bypassed.
B.	Shift Manager or CRS	ESF automatic functions may **NOT** be bypassed unless specifically directed by procedure.
C.	Manager - Shift Operations or Shift Manager	Reactor Operators must have control of the process to be bypassed.
D.	Manager - Shift Operations or Shift Manager	ESF automatic functions may **NOT** be bypassed unless specifically directed by procedure.

GENERIC 2.1.2 Knowledge of operator responsibilities during all modes of plant operation.

CFR: 55.43 (b) (5) Only the SM/CRS (SRO) can authorize bypass of an Engineered Safeguards Feature. SRO 4.4

LP 7-17-00 EO 1.4 EXPLAIN the format and use of the AOPs. As a minimum, the explanation will include a discussion of the following aspects of the AOPs: 1.4c Actions to be taken if unsure of the proper actions.

Justification of Distractors

A. Engineered Safeguards may not be bypassed unless the Operators have control of the process to be bypassed. This is from OPD-4-11 and is therefore, correct, since it covers all conditions whether proceduralized or not. This is strictly an SRO function in accordance with OPD-4-11 and SO-O-28. "4.1.1 It is recognized that in certain cases, a decision must be made rapidly as to whether or not to deviate from written guidance. In these cases either the **SHIFT MANAGER** or the **CONTROL ROOM SUPERVISOR** may make the decision unilaterally. However, if at all possible, both the **SHIFT MANAGER** and the **CONTROL ROOM SUPERVISOR** should consult with each other before making the decision."

B. Some EOPs procedurally direct bypass of safeguards actuations; for instance, EOP-03 directs bypassing Steam Generator Low Signal (SGLS) during a cool down to put the plant on shutdown cooling. However, this is not the only situation. EOP-04 and 05 direct isolating the affected steam generator, but do not identify overriding/bypassing safeguards to perform this function. It must therefore, be authorized by the SM/CRS. Therefore, this is not correct.

C&D. Plausible since the Manager - Shift Operations is a qualified Shift Manager and holds an SRO License, he could authorize this action, but not unless acting as the Shift Manager of record. Therefore, these choices are not correct.

References

OPD-4-11 Policy for When and by What Authority it is Appropriate to Bypass Engineered Safeguards

EOP-03 LOCA

Cog Level - Low

New Question

Validators LOD 2.0

Rev 1

KA#:	000000 2.1.2	Bank Ref #:	94
LP# / Objective:	07-17-00 01.04	Exam Level:	SRO
Cognitive Level:	LOW	Source:	NEW
Reference:	OPD-4-11	Handout:	

(21) QUESTION NUMBER: 095

AC-117, Spent Fuel Pool HX AC-8 CCW Inlet Valve listed on the FC-1391, Equipment Status Deviation Form, is required to be returned to its normal position.

Who approves the restoration of this valve to its normal position?

A. Work Week Manager

B. Manager - Shift Operations

C. ✔ Control Room Supervisor

D. Supervisor - Work Control Center

GENERIC 2.2.14 Knowledge of the process for controlling equipment configuration or status.

CFR: 55.43(b) SRO 4.3

LP 7-62-1 SO-OG-25A EO 1.1 State the responsibilities of the Shift Manager.

Justification of Distractors

A. The Work Week Manager coordinates maintenance, but does not authorize maintenance or restoration to be performed. Although some WWMs have held SROs, they cannot authorize restoration.
B. Manager - Shift Operations holds an SRO License, was a Shift Manager and qualified CRS, and has performed this function. Although he directs shift operations, he no longer performs this function.
C. The Shift Manager or Control Room Supervisor is designated to authorize restoration in accordance with SO-G-113. This is strictly an SRO function.
D. The Supervisor - Work Control Center holds an SRO and oversees the Tagging process; however, he is not the CRS of record and is not authorized by procedure to approve restoration.

References

SO-G-113, Equipment Status Control, Attachment 7.1- Status Control Index

SO-G-113, Equipment Status Control, Attachment 7.2 – Equipment Status Deviation Form FC-1391 Guidance. "Approval for Restoration – Shift Manager or CRS will be the individual signing approval of restoration."

SO-O-1, Conduct of Operations, paragraph 5.1.2 All on-shift Control Room Operators and Equipment Operators must be alert and aware of the status of their immediate areas of responsibility until properly relieved, and be particularly attentive to the instrumentation and controls located within these areas.

SO-G-20A, Equipment Tagging Procedure, 3.3.5 Signing-Off (Releasing) clearances at the end of their shift or when maintenance is complete.

Cog Level - Low

New Question

Validators LOD 2.0

Rev 1

KA#:	000000 2.2.14	Bank Ref #:	95
LP# / Objective:	07-62-01 01.01	Exam Level:	SRO
Cognitive Level:	LOW	Source:	NEW
Reference:	SO-G-113	Handout:	

(22) QUESTION NUMBER: 096

In order to retrieve foreign material located between fuel assemblies adjacent to an RCS hot leg, the operating shutdown cooling pump needs to be stopped.

- This activity is expected to take several hours.
- During this time, both shutdown cooling loops will be operable and available.
- Reactor Cavity time to boil is 27 hours.

In accordance with Technical Specification 2.8.1 (3) Shutdown Cooling System - High Water Level, what is the maximum time by which all containment penetrations providing direct access to the outside atmosphere be closed?

A. Immediately before the Shutdown Cooling Pump is stopped.

B. Within one hour of stopping the Shutdown Cooling Pump.

C✔ Within four hours of stopping the Shutdown Cooling Pump.

D. Within 24 hours of stopping the Shutdown Cooing Pump.

GENERIC 2.1.40 Knowledge of refueling administrative requirements.

CFR: 55.43(b) (6) SRO 3.9

LP 7-11-13 EO 2.1 Discuss the prerequisites and precautions associated with the fuel handling equipment and the refueling machine.

Justification of Distractors

A. Plausible, because this would be considered a conservative action to ensure TS 2.8.1(3) will be met, it is not correct because this is not the requirement, which accounts for a slow heatup rate after an outage in this condition with SDC stopped.

B. Plausible, because OI-CO-4 and AOP-08 require all containment pennetrations providing direct access to the outside atmosphere be closed within one hour. Incorrect, because of the same reason for A above.

C. This is the requirement in TS 2.8.3(1).

D. Plausible because of the slow heatup rate, 24 hours would meet the requirement to have all containment pennetrations providing direct access to the outside atmosphere be closed before the time to boil. Incorrect, because this is exceeds the allowable time set by TS the one condition prohibited by TS 2.8.1(3) (1) d.

References

Technical Specifications 2.8.1 (3)
SO-O-21 Attachment 1 page 34 Containment Requirements

Cog Level - Low

New Question

Validators LOD 3.5

Rev 1

KA#:	000000 2.2.40	Bank Ref #:	96
LP# / Objective:	7-11-13 02.01	Exam Level:	SRO
Cognitive Level:	LOW	Source:	NEW
Reference:	SO-O-21	Handout:	

(23) QUESTION NUMBER: 097

During core reload, a fuel assembly drops from the refueling machine damaging other bundles in the reactor vessel.

- Personnel exited the containment.
- The Shift Manager has the Command and Control ERO position.
- The Operations Support Center (OSC) is manned
- The RP Technician reports that one individual is unaccounted for and is believed to be in containment.
- The Auxiliary Building Operator (EONA) has volunteered to enter containment in an attempt to locate the individual.

Given these conditions,

1) Who can authorize exemption for the entry without a Radiation Work Permit (RWP), and
2) What requirements must be met under this exemption?

	Authorizes entry without RWP	Requirements to be met with NO RWP
A.	Shift Manager	EONA may enter alone but must have Electronic Alarming Dosimetry (EAD)
B.	Shift Manager	EONA must be accompanied by the Radiation Protection Technician
C.	Shift Radiation Protection Technician	EONA may enter alone but must have Electronic Alarming Dosimetry (EAD)
D. ✔	Shift Radiation Protection Technician	EONA must be accompanied by the Radiation Protection Technician

Radiation Control 2.3.7 Ability to comply with radiation work permit requirements during normal or abnormal conditions.

K/A fit: This meets the KA because it is asking what is required (authorization and requirements) for entry into an RCA during an abnormal condition.

10 CFR 55.43 (b) (4) SRO 3.5

LP 7-62-01 SO-O-22 EO 1.3, Who has the responsibility of controlling access and egress from Containment.

Justification for Distractors

A. Plausible, because the Shift Manager must authorize the containment entry. Incorrect, because the EONA cannot enter alone, and the Shift Manager cannot authorize entry into the RCA without an RWP, only the Shift RP Tech can do that.

B. B. Plausible, because the Shift Manager must authorize the containment entry and the EONA must be accompanied by the Radiation Protection Technician. Incorrect, because the Shift Manager cannot authorize entry into the RCA without an RWP.

C.

D. C.Plausible, because the Shift Radiation Protection Technician is the one who can authorize entry without an RWP. Incorrect, because the EONA cannot enter a alone.

D. This is the correct answer. IAW EPIP-EOF-11

References

EPIP-EOF-11, Dosimetry Records, Exposure Extensions and Habitability
RP-226, Operational Containment Entry
SO-O-22, Containment Access and Egress

Cog Level - Low

New Question

Validators LOD 4.0

Rev 0

KA#:	000000 2.3.7	Bank Ref #:	97
LP# / Objective:	7-62-0101.03	Exam Level:	SRO
Cognitive Level:	LOW	Source:	NEW
Reference:	EPIP-EOF-11	Handout:	

(24) QUESTION NUMBER: 098

The plant was at 100% power with all TS LCOs met when a Steam Generator Tube Rupture occurred.

- Off-Site Power has been lost.
- Natural Circulation is established.
- All Safeguards equipment functioned properly.

What is the maximum dose that an individual at the site boundary could experience in the first two hours following the accident?

A. 25 mRem TEDE

B. 75 mRem TEDE

C. 5 REM TEDE

D✔ 25 REM TEDE

GENERIC 2.3.14 Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.

CFR 55.41 (b) (4) SRO 3.8

LP 7-15-33 EO 3.2 EXPLAIN the maximum allowable consequences of the steam generator tube rupture analysis.

Justification for Distractors

A. 25 mRem TEDE is the annual total whole-body dose limit for any real individual due to gaseous or liquid effluent releases, which requires a special report.
B. 2000 mRem TEDE is the annual total organ dose, except thyroid, for any real individual due to gaseous or liquid effluent releases, which requires a special report.
C. 5 REM TEDE is the design basis dose for two hours to control room personnel in accordance with 10 CFR 50.67 for any accident.
D. 25 REM TEDE is the design basis dose for two hours at the site boundary for a steam generator tube rupture if the technical specification LCO of 2.1.3 for RCS radioactivity was complied with before the accident. This is SRO level question because is requires the analysis of TS bases and regulatory requierments.

References:
FC-EPF-42
EPIP-OSC-1
FCS Technical Specifications 2.1.3
10 CFR 50.67

Cog Level - Low

New Question

Validators LOD 3.5

Rev 1

KA#:	000000 2.3.14	Bank Ref #:	98
LP# / Objective:	07-15-33 03.02	Exam Level:	SRO
Cognitive Level:	LOW	Source:	NEW
Reference:	EPIP-OSC-1	Handout:	

(25)QUESTION NUMBER: 099

- The control room must be evacuated due to a fire.
- The CRS attempted to manually trip the reactor from CB-4.
- The reactor did **NOT** trip.

What action is the CRS required to perform to trip the reactor under these conditions?

A. Place the DSS Manual Trip Switches in “TRIP.”

B. Trip the reactor using the trip pushbutton on AI-31.

C. ✔ Open Clutch Power Supply Circuit Breakers CB-AB and CB-CD.

D. Commence emergency boration with all available charging pumps.

2.4.27 Knowledge of "fire in the plant" procedures.

(CFR: 43.5(b)(5) SRO 3.9 This is an action performed by the CRS (SRO) as determined by choosing AOP-06 to enter. This is not the first choice to trip the plant that an RO would make; the RO is trained to trip the plant from AI-31 or the DSS if the manual pushbutton on CB-4 did not work.

LP 7-17-06 EO 1.3 DESCRIBE the major recovery actions of this AOP.

Justification for Distractors

A. Place the DSS Manual Trip Switches in "TRIP." Is a required ATWS action in EOP-00, but not for AOP-06.
B. Trip the reactor using the trip pushbutton on AI-31. Is a required ATWS action in EOP-00, but not for AOP-06.
C. Open Clutch Power Supply Circuit Breakers CB-AB and CB-CD. AOP-06 requires the reactor to be tripped in this method due to expediency and because it is a direct method of removing all power from the CEDM clutches. Both the AI-31 pushbutton and the DSS Manual Trip Switches trip the reactor by opening the clutch power supply breakers. This is an action performed by the CRS and not delegated to the ROs. The SM, LO1, and LO2 have already been directed to take their attachments and perform actions outside the control room.
D. Commence emergency boration with all available charging pumps. Is a required ATWS action in EOP-00 is none of the automatic or manual trips work, but not for AOP-06. In addition, power will be lost to the charging pumps due to outside operator actions.

References:
AOP-06 Fire Emergency Section II – Control Room Evacuation, Step 3.a.1
EOP-00 Standard Post Trip Actions

Cog Level - Low

New Question

Validators LOD 2.0

Rev 1

KA#:	000000 2.4.27	Bank Ref #:	99
LP# / Objective:	07-17-06 01.03	Exam Level:	SRO
Cognitive Level:	LOW	Source:	NEW
Reference:		Handout:	

(26)QUESTION NUMBER: 100

A Reactor Coolant System (RCS) pressure transmitter has failed resulting in the need to bypass RPS trip units. The Manager – Shift Operations, and the Manager - Fort Calhoun Station have been notified.

Who else must be notified of the use of the Bypass keys?

A. Work Week Manager

B. ✔ NRC Resident Inspector

C. Manager - System Engineering

D. Manager - Engineering Programs Department

2.4.30 Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.

CFR 55.43 (b) (5) SRO 4.1

LP 7-62-01 EO 1.2 State the requirements for administratively bypassing Reactor Protection System trip units.

Justification for Distractors

SO-O-28 Requirements for Administratively Bypassing Reactor Protective System (RPS) Trips States:

"4.0 RESPONSIBILITIES
Shift Manager - It is the responsibility of the Shift Manager on duty to ensure the requirements of this procedure are met." As such, this is an SRO duty only.

> "5.1 The Manager-Fort Calhoun Station, Manager-Operations or Manager-Shift Operations must be notified if a bypass must be affected on any RPS trip unit. No notification is required if such bypassing is required to perform a PRC approved procedure (for example a surveillance test or PRC approved operating or maintenance procedures)."
>
> "5.5 The NRC Resident Inspector must be notified of unexpected use of RPS bypass keys."

Either the Manager – Operations or the Manager – Shift Operations must be notified, but it is not required to notify both.

This is an action soley performed by the CRS.

A failure is unexpected.

A. Plausible, because the WWM would be notified to perform maintenance on the circuit.
B. Correct IAW SO-O-28
C. Plausible, because System Engineering monitors the system health status.
D. Plausible, because Engineering Programs administer the Maintenance Rule and Equipment Reliability programs.

References:
SO-O-28 Requirements for Administratively Bypassing Reactor Protective System (RPS) Trips

Cog Level - Low

Bank Question 7-12-25 #18

Validators LOD 2.0

Rev 1

KA#:	000000 2.4.30	Bank Ref #:	7-12-25 #18
LP# / Objective:	07-62-01 01.02	Exam Level:	SRO
Cognitive Level:	LOW	Source:	BANK
Reference:	SO-O-28	Handout:	