QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

1. Following a Reactor trip, assuming all other conditions are met for closing the Reactor Trip Breakers, which ONE of the following sets of conditions will allow the breakers to close, and remain closed, when the REACTOR TRIP BREAKERS TRAINS A&B switch is taken to the CLOSE position?

   A. SG 'A' level is 18% AND IR channel N-36 is failed high

   B. SG 'A' level is 18% AND RCP 'A' is secured

   C. PZR pressure is 1920 psig AND IR channel N-36 is failed high

   D. PZR pressure is 1920 psig AND RCP 'A' is secured

Reason answer is correct: Both the pressurizer low pressure and the reactor coolant pump undervoltage reactor trips are automatically enabled or blocked by the permissive interlock P-7. With the reactor tripped the nuclear instruments will clear the P-7 interlock and block both of these reactor trip signals. The blocking of these two reactor trip signals with all other conditions clear will allow the reactor trip breakers to be closed and maintain them in the closed position.

A. *Incorrect. The first part is plausible because permissive interlock P-11 auto blocks the negative steamline isolation and allows the operator to manually block steamline low pressure safety injection. The candidate may incorrectly believe the SG water level lo-lo reactor trip has the ability to be block. The second part is plausible because permissive interlock P-10 allows the intermediate range nuclear instruments to be manually blocked while automatically blocking the source range hi flux trip. The candidate may incorrectly believe the P-10 automatically blocks the intermediate range nuclear instruments hi flux trip.*

B. *Incorrect. The first part is plausible because permissive interlock P-11 auto blocks the negative steamline isolation and allows the operator to manually block steamline low pressure safety injection. The candidate may incorrectly believe the SG water level lo-lo reactor trip has the ability to be block. The second part is correct.*

C. *Incorrect. The first part is correct. The second part is plausible because permissive interlock P-10 allows the intermediate range nuclear instruments to be manually blocked while automatically blocking the source range hi flux trip. The candidate may incorrectly believe the P-10 automatically blocks the intermediate range nuclear instruments hi flux trip*

D. *Correct.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

EPE: 007 Reactor Trip - Stabilization - Recovery / 1

007 EK2.02 Knowledge of the interrelations between a reactor trip and the following: Breakers, relays and disconnects
(CFR 41.7 / 45.7)

Importance Rating:	2.6 2.8
Technical Reference:	EMDRAC 1364 000868, Functional Diagram Primary Coolant System Trip Signals, rev 5 EMDRAC 1364 000869, Functional Diagram Pressurizer Trip Signals, rev 5
References to be provided:	None
Learning Objective:	RPS Student Text Obj 4.a
Question Origin:	Bank
Comments:	None
Tier/Group:	T1G1

2. Given the following plant conditions:
   - The unit is operating at 100% power
   - Multiple RCS alarms actuate
   - The OAC reports to the CRS that plant parameters indicate that a Pressurizer Vapor Space accident is in progress

   Which ONE of the following parameters would be the primary cause for the OAC to report this finding?

   A Pressurizer Safety Valve that was identified leaking to the PRT detected by ___(1)___ sensors in conjunction with Pressurizer level indication ___(2)___ .

   A. (1) temperature
      (2) lowering

   B. (1) temperature
      (2) rising

   C. (1) level
      (2) lowering

   D. (1) level
      (2) rising

Plausibility and Answer Analysis

Reason answer is correct: The PZR Safety and PORV leakage can be determined by temperature sensors with readout on the MCB. A PZR vapor space leak would cause a reduction in PZR pressure and rising level indications.

A. Incorrect. *Plausible since the temperature sensor is used to determine a leaking PZR Safety or PORV. Lowering level is plausible since all other leaks in the RCS or PZR except a vapor space leak would cause the level indication to lower.*

B. *Correct.*

C. Incorrect. *Plausible since both PZR Safety and PORV leakage would increase level in the PRT but level is not the primary indication that would be used since there are multiple inputs to the PRT that could cause the PRT level to change. Lowering level is plausible since all other leaks in the RCS or PZR except a vapor space leak would cause the level indication to lower.*

D. Incorrect. *Plausible since both PZR Safety and PORV leakage would increase level in the PRT but level is not the primary indication that would be used since there are multiple inputs to the PRT that could cause the PRT level to change. The second part is correct. PZR level would indicate a rising trend if there were a vapor space accident occurring.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

APE: 008 Pressurizer Vapor Space Accident / 3

008 AK2.02 Knowledge of the interrelations between the Pressurizer Vapor Space Accident and the following: Sensors and detectors
(CFR 41.7 / 45.7)

Importance Rating:	2.7 2.7
Technical Reference:	Pressurizer Student Text, Chapter 2, Major Components, Pressurizer Safety Valves, pg 13 Chapter 4, Indications and Alarms pg. 24-25 APP-ALB-009/8-3
References to be provided:	None
Learning Objective:	Pressurizer Student Text Objective 7
Question Origin:	New
Comments:	None
Tier/Group:	T1G1

3. Given the following plant conditions:
   - A Reactor Trip and Safety Injection occurred
   - All RCPs are running
   - RCS pressure is 1175 psig and slowly lowering
   - SI flow is 205 GPM
   - Containment pressure is 3.2 psig and slowly rising
   - SG pressures are 1120 psig and stable

   Which ONE of the following completes the statement below?

   In accordance with E-0, Reactor Trip Or Safety Injection, RCPs ___(1)___ be tripped AND SG's are ___(2)___ for subsequent RCS heat removal.

   A. (1) should NOT

      (2) required

   B. (1) should NOT

      (2) NOT required

   C. (1) should

      (2) required

   D. (1) should

      (2) NOT required

   Plausibility and Answer Analysis

   Reason answer is correct: *A Small Break LOCA is in progress. E-0, Reactor Trip or Safety Injection foldout for RCP trip criteria is met with RCS pressure < 1400 psig and SI flow > 200 gpm. Therefore the RCPs should be tripped. A procedure transition from E-0 to E-1 to ES-1.2 will take place for this event. In ES-1.2, Post LOCA Cooldown, the crew will initiate a RCS cooldown to CSD with SG PORV's. This method would be used instead of using the Steam Dumps since the MSIV's would be shut due to high Containment pressure. Therefore in this situtuation the SG's would still be required for subsequent heat removal until the RHR system would be placed in service.*

   A. Incorrect. Part one is plausible, if RCS pressure was > 1400 psig or SI flow was < 200 gpm this would be the correct answer. The second part is correct.

   B. Incorrect. Part one is plausible, if RCS pressure was > 1400 psig or SI flow was < 200 gpm this would be the correct answer. Part two is plausible because SGs are available but in this case they would be required to

remove heat from the RCS. During a larger break LOCA where RCS pressure is < 230 psig (RHR shutoff head) this would be the correct answer.

C. Correct.

D. Incorrect. Part one is correct. Part two is plausible because SGs are available but in this case they would be required to remove heat from the RCS. During a larger break LOCA where RCS pressure is < 230 psig (RHR shutoff head) this would be the correct answer.

Previous version:

Given the following plant conditions:
- 1SI-3, BIT Outlet Valve, is under clearance for MOV maintenance.
- A Reactor Trip and Safety Injection occurred.
- All RCPs are running.
- RCS pressure is 1370 psig and stable.
- SI flow is 150 GPM.
- Containment pressure is 4.5 psig and slowly rising.
- SG pressures are 1020 psig and stable.
- The OAC reports 1SI-4, BIT Outlet Valve, indicates dual position (red/green light lit).

Which ONE of the following completes the statement below upon transition from E-0?

RCPs ___(1)___ be tripped AND SG's are ___(2)___ for subsequent RCS heat removal.

A. (1) should NOT

(2) required

B. (1) should NOT

(2) NOT required

C. (1) should

(2) required

D. (1) should

(2) NOT required

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

EPE: 009 Small Break LOCA / 3

009 EK2.03 Knowledge of the interrelations between the small break LOCA and the following: S/Gs
(CFR 41.7 / 45.7)

Importance Rating:	3.0 3.3
Technical Reference:	E-0 Foldout, rev. 0, pg 11 EOP-ES-1.2, rev 0, pg 12 EOP-FR-H.1, rev 0, pg 3 WOG Brackground Document, pg 65
References to be provided:	None
Learning Objective:	EOP3-11, Obj. 4.e
Question Origin:	Bank
Comments:	Modified 2012 NRC RO question
Tier/Group:	T1G1

4. Given the following plant conditions:
   - A Large Break LOCA has occurred
   - The crew is implementing E-1, Loss Of Reactor Or Secondary Coolant
   - Containment pressure is 26.5 psig and lowering
   - RCS pressure is 675 psig and lowering
   - SG pressure is 950 psig and lowering
   - SI flow is 630 gpm

   Which ONE of the following identifies the required plant alginment?

   A. Secure the RCPs ONLY

   B. Secure the RHR pumps ONLY

   C. Secure the RCPs and the RHR pumps

   D. Maintain the RCPs and the RHR pumps in operation

   Plausibility and Answer Analysis

   Reason answer is correct: *A Large Break LOCA is in progress. A procedure transition from E-0, Reactor Trip Or Safety Injection to E-1, Loss of Reactor Or Secondary Coolant, will take place for this event where both procedures have a foldout for RCP trip criteria is met with RCS pressure < 1400 psig and SI flow > 200 gpm. Therefore the RCPs should be tripped. In E-1 the crew will evaluate the status of RHR pumps and if the operation of the pumps are required. With RCS pressure greater than 230 psig, but trending in a lowering direction the RHR pumps are allowed to remain running and are NOT secured.*

   A. Correct.

   B. Incorrect. Securing only the RHR pumps is plausible because it is the required action during a small break LOCA event where RCS pressure remains > 230 psig.

   C. Incorrect. Securing the RCPs is correct. Securing the RHR pumps is plausible because it is the required action during a small break LOCA event where RCS pressure remains > 230 psig.

   D. Incorrect. The RHR pumps remaining in operation is correct. Allowing the RCPs to remain in operation is plausible because FR-C.1, Response To Inadequate Core Cooling does not require normal conditions to operate RCPs.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

EPE: 011 Large Break LOCA / 3

011 EG2.4.47 Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.
(CFR: 41.10 / 43.5 / 45.12)

Importance Rating:	4.2 4.2
Technical Reference:	E-1, rev 0, pg 9, 10
References to be provided:	None
Learning Objective:	EOP-LP-3.5 Obj. 3.j
Question Origin:	New
Comments:	None
Tier/Group:	T1G1

5. With Reactor power at 8% the following occurs:
   - ALB-10-6-3A, RCS LOOP A TAVG HI/LO DEV, alarms
   - ALB-10-6-1, RCS LOOP A LOW FLOW ALERT, alarms
   - RCP 'A' control switch indication changes from red to green

   Which ONE of the following identifies the required action(s)?

   A. Manually trip the Reactor

   B. Stop the power increase and investigate

   C. Continue power increase without exceeding 25% until investigation is complete

   D. Initiate a plant shutdown using GP-006, Normal Plant Shutdown from Power Operation to Hot Standby

   Plausibility and Answer Analysis

   Reason answer is correct: Tech Spec 3.4.1.1 All RC loops shall be in operation in Modes 1 and 2 the LCO action is: with < the required RC loops in operation, be in at least Hot Stanby within 6 hours. APP-ALB-010-6-3A directs the operator to shut down the plant using GP-006 if a RCP is loss with reactor power below permissive interlock P-8 (49% Reactor Power)

   A. *Incorrect.* *Plausible since AOP-018 would direct a Reactor Trip prior to securing a Reactor Coolant pump but this only applies when a trip limit is exceeded and the RCP needs to be secured. Sicne there are no malfunctions pertaining to the entry of AOP-018 for this condition Tech Spec 3.4.1.1 would apply. Additionally, since the Reactor is operating below 49% power (P-8) an automatic Reactor trip on RCS low flow is blocked (1/3 signal with flow < 90.5% when Reactor power is below 49% is blocked) will not be generated due to the trip of a single RCP. The unit can be maintained at power with only 2 loops in operation.*

   B. *Incorrect.* *Plausible since the plant is operating below 49% power (P-8). Below P-8 the automatic Reactor trip setpoint for low flow of 90.5% on loss of one loop is blocked. The unit can be maintained at power with only 2 loops in operation and since there will be no further mode changes while increasing power stopping to investigate is reasonable.*

   C. *Incorrect.* *Plausible since OP-100 provides guidance for starting a RCP if reactor power is less than 25% in section 5.1 initial condition number 5.*

   D. *Correct.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

APE: 015 Reactor Coolant Pump Malfunctions / 4

015 AK1.02 Knowledge of the operational implications of the following concepts as they apply to Reactor Coolant Pump Malfunctions (Loss of RC Flow):Consequences of an RCPS failure
(CFR 41.8 / 41.10 / 45.3)

Importance Rating:	3.7 4.1
Technical Reference:	Tech Spec 3.4.1.1, pg 3/4 4-1 APP-ALB-010-6-3A, rev 31, pg 30
References to be provided:	None
Learning Objective:	Lesson Plan RCS Objective 13
Question Origin:	New
Comments:	None
Tier/Group:	T1G1

6. Given the following plant conditions:
   - Plant in Mode 6
   - Auto makeup to the VCT is inoperable
   - VCT level is currently 19% and slowly lowering

   In accordance with AOP-003, Malfunction of Reactor Makeup Control, which ONE of the following Operator actions are required to restore VCT level to the normal operating band?

   A. Manual makeup by opening 1CS-291 & 292, CSIP Suctions From RWST AND closing 1CS-165 & 166 VCT Outlet valves from the MCB

   B. Directing an operator to locally makeup using 1CS-278, Emergency Boric Acid Addition AND 1CS-274, Manual Blend From RMWST Isol valve

   C. Start one Boric Acid pump, then makeup by opening 1CS-283 (FK-113 Borc Acid Flow), 1CS-156 (FCV-113B, Makeup to CSIP Suction) and 1CS-151 (FCV-114, RWMU To Boric Acid Blender) from the MCB

   D. Directing an operator to locally makeup using 1CS-287, Alt Emergency Boration Manual Isol AND 1CS-274, Manual Blend From RMWST Isol valve

Reason answer is correct: *After a loss of Reactor Coolant Makeup has occurred and with the plant in Mode 6, the actions in accordance with AOP-003 to restore VCT level is to perform a makeup using Attachment 5 of the procedure. This attachment directs the operator to switch CSIP suction to the RWST from the VCT. With this alignment the RCP Seal Return that is normally aligned to the VCT Spray Nozzle would cause VCT level to rise while the VCT outlet isolation valves are shut. Additionally, with the plant in MODE 6 GP-009, Refueling Cavity Fill, Refueling and Drain of the Refueling Cavity Modes 5-6-5, step 5, directs the operators to isolate the dilution flow paths to the RCS IAW OP-107.01, Attachment 2. This lineup will have FCV-114, 1CS-274 and 1CS-287 shut and not available for normal VCT makeup.*

OP-107, 01, Section 8.6
OP-116, Section 8.11

A. Correct.

B. Incorrect. Plausible since this lineup is a path chosen IAW AOP-003 for a makeup line up to restore VCT level but would be used in Modes 1-4 if either FT-113 was not operative or 1CS-283 (FCV-113A) could not be opened.

C. Incorrect. Plausible since starting the BA pump and opening these valves would occur during an automatic makeup but this is not the correct lineup for MODE 6 makeup.

D. Incorrect. Plausible since this lineup is a path chosen IAW AOP-003 for a makeup line up to restore VCT level but would be used in Modes 1-4 when both FT-113 is operative AND 1CS-283 (FCV-113A) can be opened or is failed open.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

APE: 022 Loss of Reactor Coolant Makeup / 2

022 AA1.08 Ability to operate and / or monitor the following as they apply to the Loss of Reactor Coolant Makeup: VCT level
(CFR 41.7 / 45.5 / 45.6)

Importance Rating:	3.4 3.3
Technical Reference:	AOP-003, rev 28, pg 33-34, Attachment 5 Manual Makeup in Modes 5 and 6
References to be provided:	None
Learning Objective:	AOP-003 Objective 3
Question Origin:	Bank
Comments:	None
Tier/Group:	T1G1

7. Given the following plant conditions:
   - The plant is operating at 100% power
   - CCW Pump 'B' in service and CCW pump 'A' in standby
   - A leak occurs in the CCW system
   - ALB-005-6-1, CCW Surge Tank High-Low Level, alarms

   The following CCW flow and surge tank level indications exist as leakage from the system continues:

Time	Flow	LI-670A1 SA	LI-676A1 SB
1148	Stable	42%	42%
1150	Stable	38%	26%
1218	Oscillating	32%	23%
1220	Oscillating	9%	2%
1226	Oscillating	1%	0%

   In accordance with AOP-014, Loss of Component Cooling Water, what is the EARLIEST time the operating crew is required to place and hold the control switches to STOP for affected CCW pumps?

   A. 1150

   B. 1218

   C. 1220

   D. 1226

Plausibility and Answer Analysis

Reason answer is correct: AOP-014 Section 3.2, Leakage From CCW System step 2 RNO directs the operator to place and hold the control switch for ALL affected CCW Pumps to STOP until CCW header pressure is < 52 psig. An affected CCW Pump is one to which any of the following apply: < 4% level indicated on the CCW Surge Tank, exhibts abnormal flow, aligned to an affect Train pump through the non-essential header. Step 2 RNO applies when: ALL operable CCW Surge Tank level indicators are < 4% and CCW Pump flow indication is NOT normal.

A. Incorrect. *Plausible because when the CCW Surge Tank 'A' level is ≤ 40% this will cause the Gross Failed Fuel Detector and RCS sample panel to isolate.*

B. *Correct.*

C. Incorrect. *Plausible because 'B' level detectors is < 4% but abnormal flow indications took place at 1218 which would require the RNO action to be implemented.*

D. Incorrect. *Plausible because both CCW Surge Tank level transmitters are below 4%. Step 2 could be misinterpreted that it takes BOTH operable CCW Surge Tank level indicators to be < 4% before the RNO action is taken. but IAW AOP-014 it takes either operable CCW Surge Tank level indicators to be < 4% prior to stopping both of the CCW pumps.*

Previous question from 2012 NRC exam below

1. 2012 NRC RO 005/BANK/C/A////026 AA1.05/
Given the following plant conditions:
- The plant is operating at 100% power
- CCW Pump 'A' in service and CCW pump 'B' in standby
- A leak occurs in the CCW system causing CCW Surge Tank level to decrease

The following CCW surge tank level indications exist as leakage from the system continues:

Time	LI-670A1 SA	LI-676A1 SB
0933	39%	41%
0935	37%	38%
1003	3%	14%
1005	0%	3%

In accordance with AOP-014, Loss of Component Cooling Water, what is the EARLIEST time the operating crew is required to place and hold the control switches to STOP for affected CCW pumps?

A. 0933

B. 0935

C. 1003

D. 1005

QUESTIONS REPORT

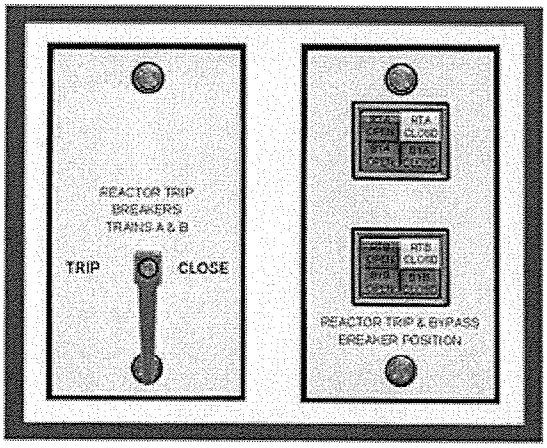
for 2013 NRC SRO REV 5 Written Exam Submittal

APE: 026 Loss of Component Cooling Water / 8

026 AA1.05 Ability to operate and / or monitor the following as they apply to the Loss of Component Cooling Water: The CCWS surge tank, including level control and level alarms, and radiation alarm
(CFR 41.7 / 45.5 / 45.6)

Importance Rating:	3.1 3.1
Technical Reference:	AOP-014, rev 37, pg 15, section 3.2, step 2 RNO APP-ALB-005-6-1, rev 21, pg 39
References to be provided:	None
Learning Objective:	AOP-014, Loss of Component Cooling Water, AOP3-14 Obj. 3
Question Origin:	Previous 2012 NRC RO-5
Comments:	Modified question with different Train in service, different times and levels.
Tier/Group:	T1G1

8. Given the following plant conditions:
   - The unit is operating at 100% power
   - Steam Dumps are in the T_{avg} mode
   - A leak on the DEH system has caused a turbine trip
   - The status of the Reactor Trip and Bypass Breakers are as indicated below



Which ONE of the following completes the statement below?

Assume the actions to locally open the Reactor Trip Breakers do not occur during the first minute of this event.

Power Range Nuclear instrument indications are expected to ___(1)___ AND SG Safety valves are expected to ___(2)___ .

A. (1) rise

   (2) lift

B. (1) rise

   (2) not lift

C. (1) lower

   (2) lift

D. (1) lower

   (2) not lift

Plausibility and Answer Analysis

Reason answer is correct: Reactor power will decrease due to the decrease in steam demand from the Turbine. Reactor pressure will increase as RCS temperature increases from the lack of a heat sink.

A. *Incorrect. Plausible that since RCS temperature is increasing that the cause is Reactor power is increasing. The second part is correct.*

B. *Incorrect. Plausible that since RCS temperature is increasing that the cause is Reactor power is increasing. The second part is plausible thinking that the SG safety valves would not lift since the relief pressure would not be reached due to all of the Steam Dump valves and SG PORV's lifting at a lower pressure setpoint than the SG Safety valves. There are five SG Safety Valves per generator with a 7% capacity each. The lift setpoint for the valves are: 1170, 1185, 1200, 1215 and 1230 psig.*
This could be true if the Steam dumps were in steam pressure mode. This would allow all of the Steam Dumps to relieve based on pressure. The valves would start to open with a lift setting of ~1092 psig. The Steam Dump total capacity is 85% of full steam load (35% for condenser dumps and 50% for atmospheric dumps). Additionally the SG PORV's with a capacity of 6% per valve (18% total) would lift at their nominal setpoint of 1105 psig. One could assume that since the combination of all of Steam Dump and SG PORV valves lifting fully open would exceed 100% steam flow capacity and therefore the SG safety valves would not lift. Since the Steam Dumps would be in Tave control the Turbine Trip controller signal would only open Condenser Steam Dumps (35% capacity) and there would NOT be enough capacity for all of the steam generate which would cause pressure to rise to SG safety relief set points and the SG safety valves would open.

C. *Correct.*

D. *Incorrect. The first part is correct. The second part is plausible, see second part of answer B.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

EPE: 029 Anticipated Transient Without Scram (ATWS) / 1

029 EK1.01 Knowledge of the operational implications of the following concepts as they apply to the ATWS: Reactor nucleonics and thermo-hydraulics behavior (CFR 41.8 / 41.10 / 45.3)

Importance Rating:	2.8 3.1
Technical Reference:	WOG Background information for FR-S.1
References to be provided:	None
Learning Objective:	Lesson Plan EOP3-15 Obj 5
Question Origin:	New
Comments:	None
Tier/Group:	T1G1

9. Given the following plant conditions:
   - The plant is in Mode 3
   - GP-007, Normal Plant Cooldown Mode 3 to Mode 5, is in progress
   - PZR Pressure and Low Steam Line Press Safety Injection Train A and B are blocked
   - RCS temperature is 485°F
   - RCS pressure is 1875 psig
   - All SG pressures are 625 psig

   A Steam Line Break occurs inside Containment and the following conditions exist:
   - Containment is 2.6 psig and rising
   - 'A' SG pressure has lowered to 450 psig in the last 30 seconds

   Which ONE of the following (1) identifies the ESFAS signals that have automatically initiated AND (2) the reason for the initiation?

   A. (1) Main Steam Isolation

      (2) Prevent uncontrolled SG level and the associated excessive RCS cooldown which could aggravate the transient.

   B. (1) Main Steam Isolation

      (2) To minimize the consequences of and/or terminate the mass energy releases associated with a high energy secondary line break.

   C. (1) Main Feedwater Isolation

      (2) Prevent uncontrolled SG level and the associated excessive RCS cooldown which could aggravate the transient.

   D. (1) Main Feedwater Isolation

      (2) To minimize the consequences of and/or terminate the mass energy releases associated with a high energy secondary line break.

Reason answer is correct: The Main Steam line isolation signal for high steamline pressure negative rate requires two of three steamline pressure instruments on any SG decrease greater than 100 psi (can be a step change or 2 psi/sec for five time constants). This actuation is enabled when the low steamline pressure SI signal is blocked. Main steamlines are isolated, when certain set points are reached, to either minimize the consequences of and/or terminate the mass and energy releases associated with a high energy secondary line break.

A. *Incorrect. The first part is correct. The second part is plausible because excess steam flow from a faulted SG will cause SG level to swell and srink due to the changes in steam pressure. The excess steam flow will also cooldown the RCS as the SG inventory is depleted.*

B. *Correct.*

C. *Incorrect. The first part is plausible because the 'A' SG pressure has lowered below the low steam line pressure safety injection setpoint of 605 psig. Any safety injection signal will also actuate a feedwater isolation, but the low steam line safety injection actuation is blocked . The second part is plausible because excess steam flow from a faulted SG will cause SG level to swell and srink due to the changes in steam pressure. The excess steam flow will also cooldown the RCS as the SG inventory is depleted.*

D. *Incorrect. The first part is plausible because the 'A' SG pressure has lowered below the low steam line pressure safety injection setpoint of 605 psig. Any safety injection signal will also actuate a feedwater isolation, but the low steam line safety injection actuation is blocked. The second part is correct.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

APE: 040 Steam Line Rupture - Excessive Heat Transfer / 4

040 AK3.02 Knowledge of the reasons for the following responses as they apply to the Steam Line Rupture: ESFAS initiation
(CFR 41.5,41.10 / 45.6 / 45.13)

Importance Rating:	4.4 4.4
Technical Reference:	WOG E-0 Background Documment, rev 2, pg 26 EMDRAC 1364 000870, Functional Diagram Steam Generator Trip Signal, rev 6
References to be provided:	None
Learning Objective:	ESFAS Student Text Obj 8.f
Question Origin:	New
Comments:	The Main Steam Supply system at HNP is not designed with in-line Non-return check valves. Unable to write a question for the original K/A 040 AK3.03 due to the lack of Non-return check valves in this system at HNP. Replace by Bruno Caballero with randomly selected K/A 040 AK3.02 6/13/2013.
Tier/Group:	T1G1

10. With the unit operating at 100% power, which ONE of the following identifies the effect, if any, an inadvertant actuation of Train 'B' Safety Injection would have on the Main Feedwater Pump(s)?

    A. Both Main FW pumps will trip

    B. No Main FW pump trip generated

    C. ONLY 'B' Main FW pump will trip

    D. 'B' Main FW pump will trip, 'A' Main FW pump will trip when Tavg lowers to < 564°F

Plausibility and Answer Analysis

Reason answer is correct: *A Safety Injection signal will cause a Main Feedwater Isolation Signal (MFIS) to be generated. The main feedwater isolation signal (MFIS) is actuated from any SI signal or a two of four highhigh SG levels (P-14 - 78%). The MFIS closes the main feedwater isolation valves (1FW-159, 1FW- 277, FW-217), the main feed regulating valves (FRVs, 1FW-133, 1FW-249, 1FW-191), the FRV bypass valves (1FW-140, 1FW-256, 1FW-198), and trips the Turbine and Main Feedwater pumps.*

A. Correct.

B. Incorrect. Plausible since the Main FW pumps continue to run at HNP during a Reactor Trip event but will both trip due to a Main FWIS caused by the SI signal.

C. Incorrect. Plausible that since only one Train of SI has actuated that only one Main FW pump would be effected.

D. Incorrect. Plausible that since only one Train of SI has actuated that only one Main FW pump would be affected, the second part is plausible since FRV's will automatically close when the reactor is tripped (P-4) coincident with tow of three loops Tavg instruments < 564°F. Although this signal will not trip the Main FW pump it could be confused with this signal.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

APE: 054 Loss of Main Feedwater / 4

054AA2.02 Ability to determine and interpret the following as they apply to the Loss of Main Feedwater (MFW): Differentiation between loss of all MFW and trip of one MFW pump

(CFR: 43.5 / 45.13)

Importance Rating:	4.1 4.4
Technical Reference:	EMDRAC 1364 000876, Functional Diagram Feedwater Control and Isolation, rev 8
References to be provided:	None
Learning Objective:	Lesson Plan ESFAS Objective 8
Question Origin:	New
Comments:	None
Tier/Group:	T1G1

11. Given the following plant conditions:
    - The unit was operating at 100% power when a Loss of Offsite Power occurred
    - The crew is implementing E-0, Reactor Trip or Safety Injection
    - The following annuciators are reported to the CRS:
        - ALB-010-6-1, 7-1, 8-1, RCS Loop Low Flow Alert
        - ALB-025-3-3, Diesel Generator B Start Failure
        - ALB-002-2-4A, Condsr Pre Trip Low Vacuum
        - ALB-002-7-2, Serv Wtr Pumps Discharge Low Press

    Based on the above annunicators and while continuing to progress through E-0, which ONE of the listed AOP's would be the appropriate procedure to address the current conditions?

    A. AOP-012, Partial Loss of Condenser Vacuum

    B. AOP-018, Reactor Coolant Pump Abnormal Conditions

    C. AOP-022, Loss of Service Water

    D. AOP-025, Loss of One Emergency AC Bus (6.9KV) or One Emergency DC Bus (125V)

Reason answer is correct: *E-0 immediate action step 3.b RNO states: as time allows restore power to de-energized emergency bus - refer to AOP-025. AOP-025 would have the operator place the emergency stop switch for EDG B in EMER STOP and then inspect the EDG for cause of trip or failure to start, contact Maintenance as necessary to initiate repair or other corrective actions, then either restore power to the emergency bus from Aux Bus 1E or from the EDG. AOP-025 would remain in effect until power was restored to the Emergency bus from one of the two power sources.*

A. Incorrect *Plausible since the annuciator in alarm during power operations would need to be addressed and would meet entry conditions for AOP-012. But under these circumstances condenser vacuum is not an issue. Without off-site power the Circ Water and Condenser Vacuum pumps will not have power to support maintaining Conderser vacuum. Condenser vacuum will degrade and not require entry into AOP-012.*

B. Incorrect *Plausible since the annuciator in alarm during power operations would need to be addressed and would meet entry conditions for AOP-018 if pump operation was abnormal. But under these circumstances a loss of RCS flow is expected since the RCP's will not have power. Therefore entry into AOP-018 will not be required.*

C. Incorrect *Plausible since the AOP would be entered from low pressure but is not a priority due to the loss of power to the NSW pumps since the stem states the events occurred due to a loss of offsite power.*

D. Correct

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

APE: 056 Loss of Off-site Power / 6

056 AG2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm.
(CFR: 41.10 / 43.5 / 45.3 / 45.12)

Importance Rating:	4.1 4.3
Technical Reference:	E-0, rev 0, immediate action step 3 RNO, APP-ALB-025-3-3, rev 15, pg 8 AOP-025, rev 34, entry conditions and supporting procedure steps for loss of power to 1B-SB Emergency AC Bus
References to be provided:	None
Learning Objective:	EOP-3-1 Objective 2
Question Origin:	New
Comments:	None
Tier/Group:	T1G1

12. Given the following plant conditions:
    - The plant is operating at 100% power
    - ALB-015-4-5, Channel III UPS Trouble has just alarmed
    - Feed flows to all SG's have not changed
    - The S-III inverter static switch indicates aligned to inverter

    Which ONE of the following completes the statements below?

    The Instrument Bus III Inverter input has lost __(1)__.

    In accordance with Technical Specification 3.8.3.1 the Inverter is __(2)__.

    A. (1) DC power ONLY

       (2) Operable

    B. (1) DC power ONLY

       (2) Inoperable

    C. (1) AC and DC power

       (2) Operable

    D. (1) AC and DC power

       (2) Inoperable

    Plausibility and Answer Analysis

    Reason answer is correct: Annunciator ALB-015-4-5 has five (5) potential causes - Loss of AC input voltage, Loss of AC output voltage, Loss of DC input voltage, Loss of DC voltage, and Alarm circuit or instrumentation malfunction. A loss of DC power ONLY will cause the alarm to annunciate. A loss of Instrument Bus III automatic function is loss of power to Channel III SG level instruments and will cause all Feed Regulating valves to fail open. Because the static switch remains aligned to the inverter the normal position, Both the AC and DC power are not affected. IF both AC and DC power supplies were affected the static switch would align to the bypass power supply. IF the normal (AC), backup (DC) or bypass (AC) power supplies have not been affected then there will be no affect on SG level control.

    A. *Incorrect.* *The first part is correct. The second part is plausible because the technical specification LCO has a note that allows two inverters to be disconnected from their 125 VDC bus for up to 24 hours as ncessary, for the purpose of performing an equalizing charge on the associated Emergency battery.*

    B. *Correct.*

C. Incorrect. *The first part is plausible since the inverters have a static switch that would maintain the inst bus energized on a loss of AC and DC inputs to the inverter, but this power source has not been analyzed to ensure the terminal voltage from this power source is adequate to support LOCA conditions and therefore the inverter is considered inoperable. The second part is plausible because the technical specification LCO has a note that allows two inverters to be disconnected from their 125 VDC bus for up to 24 hours as ncessary, for the purpose of performing an equalizing charge on the associated Emergency battery.*

D. Incorrect. *The first part is plausible since the inverters have a static switch that would maintain the inst bus energized on a loss of AC and DC inputs to the inverter, but this power source has not been analyzed to ensure the terminal voltage from this power source is adequate to support LOCA conditions and therefore the inverter is considered inoperable. The second part is correct.*

Given the following plant conditions:
- The plant is operating at 100% power
- ALB-015-4-5, Channel III UPS Trouble has just alarmed
- Feed flows to all SG's have not changed

Which ONE of the following completes the statements below?

The Instrument Bus III Invertor input has lost __(1)__. IAW Tech Spec 3.8.3.1 the normal power supply alignment must be restored to the Inverter within __(2)__ hours.

A. (1) DC power ONLY

(2) 2

B. (1) DC power ONLY

(2) 24

C. (1) AC and DC power

(2) 2

D. (1) AC and DC power

(2) 24

APE: 058 Loss of DC Power / 6

058 AA2.01 Ability to determine and interpret the following as they apply to the Loss of DC Power: That a loss of dc power has occurred; verification that substitute power sources have come on line
(CFR: 43.5 / 45.13)

Importance Rating:	3.7 4.1
Technical Reference:	AOP-025-BD, Rev. 14, pg 51 APP-ALB-015-4-5, rev 21, pg 25 Technical Specification 3.8.3.1, pg 3/4 8-16
References to be provided:	None
Learning Objective:	AOP-LP-3.25 Objective 6
Question origin:	Modified
Comments:	For HNP, DC power is normally the single source of power or the backup power supply to components. Inverters are the only components that have another source in addition to DC and thus the only source for a question for this K/A.
Tier/Group:	T1G1

13. Given the following plant conditions:
    - The plant is operating at 100% power

The following MCB indications exist:

	Time 1135	1138	1140
ESW Header A			
PI-9101A SA, A Disch Press	88 psig	86 psig	94 psig
FI-9101A1 SA, A Hdr Flow	14550 gpm	11820 gpm	13390 gpm
ESW Header B			
PI-9101B SB, B Disch Press	89 psig	85 psig	81 psig
FI-9101B1 SB, B Hdr Flow	15725 gpm	18550 gpm	13600 gpm
NSW Header			
PI-9302.1, Disch Hdr Press	82 psig	80 psig	112 psig
FI-9304, WPB SW Flow	9800 gpm	8250 gpm	11800 gpm
FI-9276, Cnmt Coil Units SW Return	1840 gpm	1560 gpm	2900 gpm

AOP-022, Loss of Service Water has been entered and both ESW pumps have been started.

Which ONE of the following completes the statements below?

The Service Water line rupture is located in the __(1)__ ESW Header. In accordance with AOP-022 to isolate the ESW Header leak, the operator will be directed to place and hold __(2)__ control switch(es) to STOP.

A. (1) 'A'

   (2) the ESW Pump 'A'

B. (1) 'A'

   (2) both ESW Pump 'A' and 'B'

C. (1) 'B'

   (2) the ESW Pump 'B'

D. (1) 'B'

   (2) both ESW Pump 'A' and 'B'

Plausibility and Answer Analysis

Reason answer is correct: The ruptured ESW or NSW header is typically indicated by lower pressure and higher flow in the same header than those existing prior to the breach. By utilizing the data trends the candidate should be able to identify the ruptured header as the 'B' header. IAW AOP-022 to isolate the rupture ESW Header

ruptured header as the 'B' header. IAW AOP 322 to isolate the rupture ESW Header the operator is directed to place and hold the ruptured header ESW Pump control switch to STOP.

A. Incorrect. Plausible because the decreasing pressure and flow indications on 'A' ESW header could lead someone to believe the rupture is on the 'A' line. The second part of the answer is correct.

B. Incorrect. Plausible because the decreasing pressure and flow indications on 'A' ESW header could lead someone to believe the rupture is on the 'A' line. The second part of the answer is plausible if the system were crosstied but the ESW has two seperate trains.

C. Correct.

D. Incorrect. The first part is correct. The second part of the answer is plausible if the system were crosstied but the ESW has two seperate trains.

(2) Both ESW Pump A and B

APE: 062 Loss of Nuclear Service Water / 4

062AA2.01Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: Location of a leak in the SWS
(CFR: 43.5 / 45.13)

Importance Rating:	2.9 3.5
Technical Reference:	AOP-022, rev 35, Section 3.0, Steps 8 and 10, pg 8, 9
References to be provided:	None
Learning Objective:	AOP-022, Loss of Service Water, AOP3-22 Obj. 4
Question Origin:	Bank
Comments:	Previous 2012 NRC Exam question
Tier/Group:	T1G1

14. Given the following plant conditions:
    - The crew is currently implementing E-3, Steam Generator Tube Rupture
    - The OAC has been directed to reset Phase A and Phase B isolation signals
    - The OAC reports Train 'A' Phase A valves will not open after completing the reset

    Based on the above conditions, which ONE of the following completes the statement below?

    Actions to depressurize the RCS will require using ___(1)___ , this is because they are equipped with ___(2)___ as the primary supply source.

    A. (1) PZR Spray Valves

       (2) Nitrogen

    B. (1) PZR Spray Valves

       (2) Instrument Air

    C. (1) PZR PORVs

       (2) Nitrogen

    D. (1) PZR PORVs

       (2) Instrument Air

Reason answer is correct: EOP-E-3 step 58 is the RCS depressurization to ruptured SG step. Normal Spray will be used (if available) which must include instrument air to containment. IA-819, Instrument Air to Containment is a Phase 'A' Train 'A' valve and will not open if the Phase A isolation signal is not reset. The RNO for step 58 is to go to step 64 which is using PRZ PORVs (at least one available). One PRZ PORV will be opened until the RCS depressurization termination criteria is satisfied. PRZ PORVs are equipped with individual accumulators which are supplied with nitrogen or instrument air for motive power. The nitrogen supply regulator is the primary source with two parallel instrument air regulators as the backup source. The nitrogen regulator is set at higher pressure (98 psig) than the instrument air regulators (92 psig) and is the primary supply to the accumulators.

A. *Incorrect. Plausible since if air is available to the Containment the spray valves would be the first choice for RCS pressure reduction. The second part is plausible if the candidate confuses the PORVs and Spray valves.*

B. *Incorrect. Plausible since if air is available to the Containment the spray valves would be the first choice for RCS pressure reduction. The second part is plausible if the candidate confuses the PORVs and Spray valves.*

C. *Correct.*

D. *Incorrect. The first part is correct. The second part is plausible if the candidate gets the normal and backup supplies backwards.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

APE: 065 Loss of Instrument Air / 8

065 AK3.08 Knowledge of the reasons for the following responses as they apply to the Loss of Instrument Air: Actions contained in EOP for loss of instrument air (CFR 41.5,41.10 / 45.6 / 45.13)

Importance Rating:	3.7 3.9
Technical Reference:	E-3 Attachment 7, Rev. 0 PRZ Pressure Control Student Text
References to be provided:	None
Learning Objective:	PZRPC Student Text Obj 8
Question Origin:	New
Comments:	Bruno's comment - Question needs to be written while in EOP's then loss of air occurs - such as loss of air to containment while trying to restore air or EOP step while trying to manipulate a component how will air be restored? Actions are complicated with loss of air during EOP actions. Keep in mind that this is a Tier 1 not just testing system interlocks or design features.
Tier/Group:	T1G1

15. Given the following plant conditions:
    - The unit is operating at 100% power
    - ALB-022-4-3, Generator Volt/Freq Ratio High Or Under Freq, alarms
    - Generator frequency on EI-525 is indicating 58.3 Hz and stable

    Which ONE of the following actions is/are required?

    A. Reduce Turbine Load to maintain Reactor power less than 100%

    B. Raise Generator Excitation to maintain within the limits of the generator capability curve

    C. Monitor the low frequency condition, and if it exists for 5 minutes, initiate a Reactor shutdown

    D. Immediately trip the Reactor and enter E-0, Reactor Trip And Safety Injection

    Plausibility and Answer Analysis

    Reason answer is correct: Entry conditions were met for AOP-028 when the Load Dispatcher informed the Control Room that System frequency is low and obsereved frequency is < 59.5 Hz. AOP-028 has a caution dealing with low frequency operations stating that operation below 58.4 Hz is not allowed and the generator must be taken off-line immediately. Step 2 which is a continuous action step checks for Generator frequency and if < 58.4 Hz the action is to Trip the Reactor and GO TO EOP E-0.

    A. Incorrect. Plausible since the turbine has an automatic response for an overfrequency condition to reduce load in a attempt to lower grid frequency. It is possible to beleive that the turbine will automatically open the governor valves in an attempt to restore grid frequency back to 60 Hz resulting in the reactor exceeding 100% power.

    B. Incorrect. Plausible since a reduction of excitation could be required if frequency was > 59 Hz.

    C. Incorrect. Plausible since this would be correct if a frequency of < 59 Hz existed for > or equal to 5 minutes but did not lower to < 58.4 Hz at any time.

    D. Correct.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

APE: 077 Generator Voltage and Electric Grid Disturbances / 6

077 AG2.4.4 Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures. (CFR: 41.10 / 43.2 / 45.6)

Importance Rating:	4.5 4.7
Technical Reference:	AOP-028, rev 30, pg 4, Section 3.0 step 2
References to be provided:	None
Learning Objective:	Lesson Plan AOP-028, Grid Instabilty, obj 2A
Question Origin:	Bank
Comments:	None
Tier/Group:	T1G1

16. Given the following plant conditions:
    - The unit was operating at 100% power
    - A LOCA has occurred in the RAB and the crew is implementing ECA-1.2, LOCA Outside Containment

Which ONE of the following identifies the method for confirmation that efforts to isolate the LOCA outside Containment has been successful AND why is this method used?

A. RCS pressure rising, a significant RCS pressure increase will occur due to the SI flow filling up the RCS with break flow stopped

B. PZR level rising, a significant PZR level change will occur due to the SI flow filling up the RCS with break flow stopped.

C. Safety Injection flow lowering, due to a lower amount of flow being injected when the break is isolated.

D. RAB radiaton levels lowering, due to an immediate reduction in radiation levels when the break is isolated in the RAB.

Plausibility and Answer Analysis

Reason answer is correct: ECA-1.2 checks to see if RCS pressure is rising for confirmation the actions taken to isolate a LOCA outside of containment are successful due to the significant RCS pressure increase that will occur due to the SI flow filling up the RCS with break flow stopped.

A. Correct.

B. Incorrect. Plausible because one the parameters used to determine if safety injection termination criteria are satisfied in other procedures in the EOP network is the pressurizer level being greater than 10% and rising due to SI flow exceeding break flow

C. Incorrect. Plausible because the CSIP is a multistage centrifugal pump and the flow rate of the pump varies based on the differential pressure the pump discharge is trying to overcome.

D. Incorrect. Plausible because the Radiation monitors are use in other procedures to detect the presence of an RCS leak, i.e. SGTR, etc. While performing AOP-020, Loss Of RCS Inventory Or Residual Heat Removal While Shutdown, radiation levels are monitored in containment during the performance of containment isolation. The candidate may believe the RAB radiation level is monitored to determine if leak isolation was successful.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

EPE: E04 LOCA Outside Containment / 3

WE04 EK3.2 Knowledge of the reasons for the following responses as they apply to the (LOCA Outside Containment): Normal, abnormal and emergency operating procedures associated with (LOCA Outside Containment).
(CFR: 41.5 / 41.10, 45.6, 45.13)

Importance Rating:	3.4 4.0
Technical Reference:	ECA-1.2, rev 0, pg 5, step 6 WOG Background Document ECA-1.2, rev 2, pg 14
References to be provided:	None
Learning Objective:	Lesson plan EOP-LP-2.3/3.3, rev 9, obj 2.d
Question Origin:	New
Comments:	None
Tier/Group:	T1G1

17. Given the following plant conditions:
    - Bleed & Feed is in progress in accordance with FR-H.1, Response to Loss of Secondary Heat Sink
    - AFW feed capability has been restored
    - Core Exit Thermocouple temperatures are stable
    - All SG wide range levels are 10%

    Which ONE of the following is the basis for limiting AFW flow to 50 kpph to one SG for the conditions listed above?

    A. Minimize thermal stresses in the SG when AFW flow is initiated.

    B. Minimize thermal stresses in the Reactor Vessel from excessive cooldown.

    C. Ensure RCS temperature remains stable to prevent pressure control problems.

    D. Ensure feed flow is within the capability of the only available source of feed water.

    Plausibility and Answer Analysis

    Reason answer is correct: If RCS temperatures are stable or decreasing when feedwater flow is restored, the flow should be directed to one S/G and the rate should be limited to the plant-specific equivalent of 25 - 100 gpm (50 Kpph for HNP) until wide range level is established. The feedwater flow rate is limited to minimize the potential impact of excessive thermal stresses since a direct measure of the steam generator temperature is not available

    A. Correct.

    B. Incorrect. Plausible because the basis for the RCS cooldown limits are to minimize thermal stress of the Reactor vessel and the normal method of controlling RCS cooldown rate is to control steam flow and feed flow to the steam generators.

    C. Incorrect. Plausible because the crew intiated Bleed and Feed, and a possible result is the pressurizer has become water solid. With the pressurizer solid small changes in RCS temperature will have a dramatic effect of the RCS pressure. Limiting the flow rate of the feedwater flow to the S/Gs limits the possible cooldown of the RCS and the pressure challanges that may occur while solid.

    D. Incorrect. Plausible because the AFW system is designed for removal of decay heat from the RCS and has a minimal amount of flow capacity. Depending on the AFW pump that has been restored the candidate may believe the capacity of the in service AFW pump could be challanged if flow was established to all 3 S/Gs.

EPE: E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4

WE05 EK1.2 Knowledge of the operational implications of the following concepts as they apply to the (Loss of Secondary Heat Sink): Normal, abnormal and emergency operating procedures associated with (Loss of Secondary Heat Sink).
(CFR: 41.8 / 41.10, 45.3)

Importance Rating:	3.9 4.5
Technical Reference:	FR-H.1, rev 0, pg 61 WOG Background Document, FR-H.1, rev 2, pg 52
References to be provided:	None
Learning Objective:	EOP-LP-3.11, rev 11, obj 4.c
Question Origin:	Bank
Comments:	None
Tier/Group:	T1G1

18. Given the following plant conditions:
    - A LOCA has occurred
    - Containment pressure is 15 psig and lowering
    - Due to multiple equipment failures, the crew has transitioned from ES-1.3, Transfer to Cold Leg Recirculation to EOP-ECA-1.1, Loss Of Emergency Coolant Recirculation
    - Two CSIPs, both CT pumps, and two RHR pumps are running
    - RWST level is approximately 14% and lowering at 1.8% per minute
    - The OAC secured 'A' CT pump

    Which ONE of the following identifies (1) the reason for securing the CT pump in EOP-ECA-1.1 AND (2) the other major action that will be required while the crew continues with this procedure?

    A. (1) conserve RWST level

       (2) secure the other Containment Spray pump as soon as Containment pressure is <8 psig

    B. (1) conserve RWST level

       (2) try to add makeup to the RCS from an alternate source

    C. (1) reduce containment sump level increase

       (2) secure the other Containment Spray pump as soon as Containment pressure is <8 psig

    D. (1) reduce containment sump level increase

       (2) try to add makeup to the RCS from an alternate source

Reason answer is correct: The purpose of the procedure provides actions to restore emergency coolant recirculation capability to delay depletion of the RWST by adding makeup and reducing outflow, and to depressurize the RCS to minimize break flow. As RWST level continues to lower the crew will be required secure pumps taking a suction from the RWST and try to add makeup to the RCS from alternate sources
The major action categories of EOP-ECA-1.1 are:
- Continue Attempts to Restore Emergency Coolant Recirculation
- Raise/Conserve RWST Level
- Initiate Cooldown to Cold Shutdown
- Depressurize RCS to Minimize Subcooling
- Try to Add Makeup to RCS from Alternate Source
- Depressurize SGs to Cool Down and Depressurize RCS
- Maintain RCS Heat Removal

A. Incorrect. *The first part is correct. The second part is plausible since securing the second Containment Spray pump will conserve RWST level but securing the pump as soon as Containment pressure is < 10 psig is not consistant with the guidance found in ECA-1.1. The action to secure a Containment Spray pump after a LOCA is found in a table on step 7 and is based on RWST level, Containment Pressure and the Total Number of Fan Cooler Units. Futher plausibility can be found in E-1, Loss of Reactor or Secondary Coolant Attachment 1 which contains guidance for placing the Containment Spray system in standby. Pressure should be below the Containment HI-3 reset setpoint of 8 psig to ensure that Containment spray can automatically actuate if pressure sebsequently rises above the HI-3 setpoint of 10 psig. Westinghouse caclulation determined that one train of Containment spray and one train of Containment fan coolers should remain in service for a minimum of 4 hours. Therefore securing all Containment spray pumps even after Containment pressure decreases to < 8 psig is not correct.*

B. *Correct.*

C. Incorrect. *The first part is plausible since during the time that the Containment Spray system is in operation for a LOCA event the Spary Additive tank will be part of the suction supply to the pump. It is reasonable to believe that conserving the sodium hydroxide in the tank will help to ensure that the correct amount of chemicals are delivered to get the LOCA water in the Containment sumps to the correct pH level. The second part is plausible for the reason given in the second part of answer A.*

D. Incorrect. *The first part is plausible for the reason given in the first part of answer C. The second part is correct.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

EPE: E11 Loss of Emergency Coolant Recirculation / 4

WE11 EA1.3 Ability to operate and / or monitor the following as they apply to the (Loss of Emergency Coolant Recirculation): Desired operating results during abnormal and emergency situations.
(CFR: 41.7 / 45.5 / 45.6)

Importance Rating:	3.7 4.2
Technical Reference:	EOP-ECA-1.1, rev 0, pg 1 purpose and major actions categories, pg 4, 44,46 EOP-E-1, Attachment 1, pg 29
References to be provided:	None
Learning Objective:	Lesson plan EOP-LP-2.3/3.3, rev 9, obj 1 and 2
Question Origin:	New
Comments:	None
Tier/Group:	T1G1

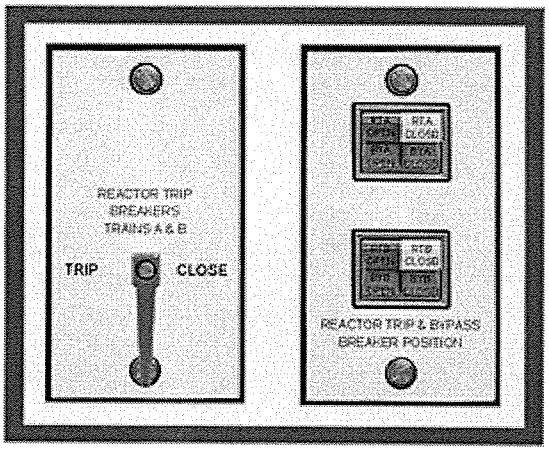
19. Given the following plant conditions:
    - A Reactor startup is in progress
    - The OAC withdraws CBD from 20 steps to the next doubling in accordance with GP-004, Reactor Startup (Mode 3 To Mode 2)
    - While withdrawing CBD the Reactor Trip Breaker indications change as indicated in the pictures below
    - The OAC releases the Rod Motion switch, but CBD rods continue to withdraw

    Which ONE of the following completes the statement below?

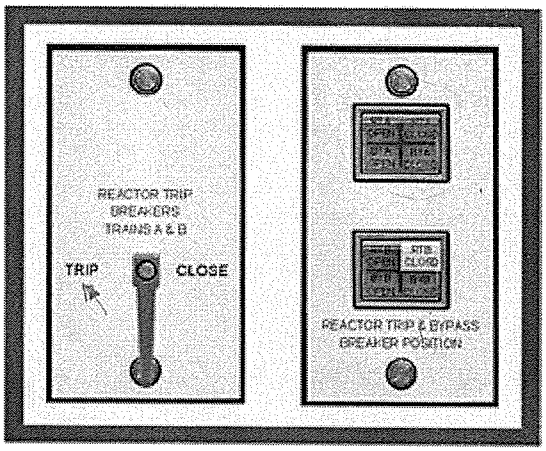
    The current status of the reactor is __(1)__ AND the indication on the MCB means a there is a possible failure of the __(2)__ Trip coil.

    (Assume NO operator actions)

Before



After



A. (1) tripped

   (2) UV

B. (1) tripped

   (2) Shunt

C. (1) NOT tripped

   (2) UV

D. (1) NOT tripped

   (2) Shunt

Reason answer is correct: With control rods continuing to withdraw from the reactor following the release of the IN/OUT Rod motion switch the Reactor trip breakers have remained shut and continue to provide power to the CRDMs. The loss of indication on the Reactor Trip breakers identifies the potential failure of the shunt trip coil and because it is an energize to actuate breaker the reactor trip breaker may not be trippable from the shunt trip device.

A. Incorrect. *Part one is plausible because only one Reactor Trip Breaker is required to open in order to remove power from the CRDM and allow the rods to insert into the Reactor. Part two is plausible because the UV coil de-energizes to actuate a reactor trip and the loss of indication can be perceived as the reactor trip breaker has opened.*

B. Incorrect. *The first part one is plausible because only one Reactor Trip Breaker is required to open in order to remove power from the CRDM and allow the rods to insert into the Reactor. The second part is correct.*

C. Incorrect. *The first part is correct. The second part two plausible because the UV coil de-energizes to actuate a reactor trip and the majority of RPS bi-stable lights energize when power is loss and the loss of indication can be perceived as the UV trip has loss continuity.*

D. *Correct.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

APE: 001 Continuous Rod Withdrawal / 1

001 AA2.01 Ability to determine and interpret the following as they apply to the Continuous Rod Withdrawal : Reactor tripped breaker indicator (CFR: 43.5 / 45.13)

Importance Rating:	4.2 4.2
Technical Reference:	AOP-001-BD, rev 18, pg 2 OP-104, rev 33, pg 6
References to be provided:	None
Learning Objective:	Lesson plan AOP-LP-3.1, rev 8, obj 4
Question Origin:	New
Comments:	None
Tier/Group:	T1G2

20. Given the following plant conditions:
    - The unit is in Mode 6 with refueling in progress
    - A fuel assembly is being moved from the core to the Containment upender
    - A large leak develops in the cavity due to a failure of a Steam Generator nozzle dam
    - The Refueling SRO reports that Reactor cavity level is begining to lower approximately 2 inches every minute
    - The Refueling crew is returning the fuel assembly to the Reactor when a loss of off-site power occurs

    Which ONE of the following completes the statement below concerning the loss of Off-site power during this event?

    Upon the loss of Off-site power the crew will NOT have the ability to....

    A. add makeup water to the cavity.

    B. place the fuel assembly back into the Reactor.

    C. monitor the reactivity condition of the core.

    D. monitor radiological levels inside Containment.

Reason answer is correct: *Cavity level will be lowering with an assembly in the manipulator mast when power to 1E11-1A is lost to the manipulator so no means of moving the assembly to a safe location (back to the Reactor) exists.*

A. Incorrect. *Plausible that makeup would not be available since normal makeup to the RCS is from the RCS makeup system and on a a loss of off-site power the Reactor Makeup Water pumps would not have power. Therefore makeup from the RCS makeup system would not be possible. But since the unit is in refueling makeup to the refueling cavilty would be from the CSIP and RHR pumps where the suction source comes from the RWST. Both of these pumps are powered by safeguards buses which would have power since they are powered fom the EDGs. Additionally, the inadvertant dilution lineup would have the normal makeup path isolated and power removed from the Reactor Makeup Water pumps.*

B. *Correct.*

C. Incorrect. *Plausible since power is lost, but nuclear instruments are supplied by instrument buses which have backup DC power supplies in the event of a loss of AC.*

D. Incorrect. *Plausible since power is lost, but rad monitors are supplied by instrument buses which have backup DC power supplies in the event of a loss of AC.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

APE: 036 Fuel Handling Incidents / 8

036 AK2.01 Knowledge of the interrelations between the Fuel Handling Incidents and the following: Fuel handling equipment
(CFR 41.7 / 45.7)

Importance Rating:	2.9 3.5
Technical Reference:	FHP-020, Page 81, Attachment 4, Rev. 49 power to Fuel Xfer Manipulator Crane from bus 1E11-1A (non-safety releated source)
References to be provided:	None
Learning Objective:	FHS Student Text Obj 6
Question Origin:	Bank
Comments:	None
Tier/Group:	T1G2

21. Given the following plant conditions:
    - The crew diagnosed a 150 gpd tube leak on the 'B' SG
    - The plant is shutdown as required by AOP-016, Excessive Primary Plant Leakage

    Which ONE of the following identifies the reason why RCS Hot Leg temperature is lowered prior to closing the Main Steam Isolation Valve for the 'B' SG?

    A. Remove sensible heat from the ruptured SG

    B. Minimize the likelihood of a release to the environment

    C. Depressurize the ruptured SG below the unaffected SG pressures

    D. Minimize the likelihood of a later Pressurized Thermal Shock event

    Plausibility and Answer Analysis

    Reason answer is correct: Per the AOP-016 basis document the operator is directed to cooldown the RCS Hot legs to less that 557°F because this value is below the SG PORV lift setpoint and therefore the potential for uncontrolled release of radioactivity from the leaking SG is reduced.

    A. Incorrect. Plausible because removing senible heat from the SG would change the volume of the mass in the SG similar to the pressurizer and lower the level in the SG to allow more margin to SG overfill conditions.

    B. Correct.

    C. Incorrect. Plausible because one of the major strategies of the in E-3, Series of procedures is to reduce RCS pressure to below the ruptured SG pressure to allow back leakage from the SG into the RCS to limit the spread of contamination and the potential for excessive radioactive waste in the secondary system.

    D. Incorrect. Plausible because the normal actions peformed by the EOP network is to control RCS temperature between 555 and 559°F and the MSIVs are shut to prevent excessive cooldown of the RCS if temperature is below 557°F and lowering.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

APE: 037 Steam Generator (S/G) Tube Leak / 3

037 G2.4.31 Knowledge of annunciator alarms, indications, or response procedures. (CFR: 41.10 / 45.3)

Importance Rating:	4.2 4.1
Technical Reference:	AOP-016, rev 53, pg 48, 50, Attachment 11 AOP-016-BD,rev 27, pg 40
References to be provided:	None
Learning Objective:	Lesson Plan AOP-LP-3.16 Objective 5
Question Origin:	Bank
Comments:	The only HNP RO tasks outside of the MCR are addressed by AOP-004, Main Control Room Evacuation. Unable to write a question for the original K/A 037 AG 2.4.34 due to the lack of an RO task for this K/A. Replace by Bruno Caballero with randomly selected K/A AG2.4.31 4/18/2013.
Tier/Group:	T1G2

22. Given the following plant conditions:
    - The plant was operating at 60% power when air leakage into the condenser resulted in degrading vacuum

    The following indications are received:

Time	Condenser pressure
0800	3.1 In. Hg. Abs.
0805	3.4 In. Hg. Abs.
0810	3.9 In. Hg. Abs.
0815	4.5 In. Hg. Abs.

    Which ONE of the following completes the statement below?

    Based on the trend of Condenser pressure, Generator Output on the DEH panel will be ___(1)___ than before the event AND Control Bank D will ___(2)___ rod position.

    A. (1) higher

       (2) insert to a lower

    B. (1) higher

       (2) remain at the same

    C. (1) lower

       (2) insert to a lower

    D. (1) lower

       (2) remain at the same

Reason answer is correct: As air leaks into the Main condenser the temperature of the hotwell begins to rise. The efficiency of the Main turbine lowers a due to the rising condenser backpressure. As the turbine becomes less efficient the generator is not able to produce as much electricity and the generator output begins to lower. Due to the rising condenser pressure, condenser hotwell temperature will rise approximately 15 degrees. Higher temperature of the condensate would result in less heat transfer of the 5 feedwater heaters and feedwater temperature change would be minor. The minor change in feedwater temperature would raise average reactor coolant system temperature by a minor amount but less than 1.5 degrees to where rod control would respond.

A. Incorrect. *The first part is plausible if the candidate believes that the governor valves would respond to the rising condenser pressure to raise load and keep DEH reference and demand matched. The second part is plausible if the candidate believes that a 15 degree rise in condensate temperature would result in a 15 degree rise in feedwater temperature and subsequently RCS temperature.*

B. Incorrect. *The first part is plausible if the candidate believes that the governor valves would respond to the rising condenser pressure to raise load and keep DEH reference and demand matched. The second part is correct.*

C. Incorrect. *The first part is correct. The second part is plausible if the candidate believes that a 15 degree rise in condensate temperature would result in a 15 degree rise in feedwater temperature and subsequently RCS temperature.*

D. *Correct.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

APE: 051 Loss of Condenser Vacuum / 4

051 AA1.04 Ability to operate and / or monitor the following as they apply to the Loss of Condenser Vacuum: Rod position
(CFR 41.7 / 45.5 / 45.6)

Importance Rating:	2.5 2.5
Technical Reference:	AOP-012-BD, rev 12, pg 3 RODCS Student Text Figure 23
References to be provided:	None
Learning Objective:	Lesson Plan AOP-012 Objective 3
Question Origin:	New
Comments:	None
Tier/Group:	T1G2

23. Given the following plant conditions:
    - The unit is in Mode 3
    - The crew is implementing GP-007, Normal Plant Cooldown Mode 3 to Mode 5
    - Annunciator ALB-004-2-2, Refueling Water Storage Tank Low Level, alarms
    - RWST level indicators LI-990, LI-991, LI-992, and LI-993 are 87% and dropping rapidly

    Which ONE of the following completes the statement below?

    To respond to this condition the crew is required to enter ___(1)___ AND evaluate de-energizing the affected equipment ___(2)___.

    A. (1) AOP-008, Accidential Release of Liquid Waste

       (2) because Low RWST level may result in pump damage in the event of SI or Containment Spray actuation

    B. (1) AOP-008, Accidential Release of Liquid Waste

       (2) if the leak is NOT expected to stop draining the RWST before level is low enough to entrain air in the RHR pump loop suctions and jeopardize RHR flow

    C. (1) AOP-020, Loss of RCS Inventory or Residual Heat Removal While Shutdown

       (2) because Low RWST level may result in pump damage in the event of SI or Containment Spray actuation

    D. (1) AOP-020, Loss of RCS Inventory or Residual Heat Removal While Shutdown

       (2) if the leak is NOT expected to stop draining the RWST before level is low enough to entrain air in the RHR pump loop suctions and jeopardize RHR flow

Reason answer is correct: RWST level decreasing or annuciator ALB-04-2-2 alarming are entry conditions for AOP-008. After checking the RWST tank level is NOT normal with level dropping rapidly or < 25% then evaluate de-energizing RHR and Containment Spray Pumps and isolating CSIPs from the RWST. A caution in the procedure states that "Low RWST level may result in pump damage in the event of Safety Injection or Containment Spray actuation".

A. Correct.

B. Incorrect. Plausible with the first part correct. The second part is plausible if the candidate believes that RHR is in operation - it cannot be with the unit in Mode 3 since the P&L for RHR operation restricts it's use until the RCS is <350°F. Mode 3 is ≥350°F. If RHR were in service and a leak were to develop AOP-020 discusses that leaks resulting from a failed Refueling Cavity seal or a failed SG nozzle dam (which would be covered through AOP-031 implementation) are expected to stop draining the system before level fails low enough to entrain air in the RHR pump loop suctions and jeopardize RHR flow. A candidate could relate this information to the rapidly lowering RWST level and RHR suction problems when being supplied by the RWST.

C. Incorrect. Plausible since a majority of entry conditions for AOP-020 are for dropping levels in tanks, areas or systems. With the unit just being shutdown, in Mode 3 and at the start of an outage, the candidate could conclude that RHR is in service and associate these problems with entry conditions to AOP-020. The second part of the answer is correct.

D. Incorrect. Plausible since a majority of entry conditions for AOP-020 are for dropping levels in tanks, areas or systems. With the conditions provided in the quesiton (just been shutdown at the start of an outage) and the unit in Mode 3 the candidate could conclude that RHR is in service and associate this problems with entry conditions to AOP-020. The second part is plausible if the candidate believes that RHR is in operation - it cannot be with the unit in Mode 3 since the P&L for RHR operation restricts it's use until the RCS is <350°F. Mode 3 is ≥350°F. If RHR were in service and a leak were to develop AOP-020 discusses that leaks resulting from a failed Refueling Cavity seal or a failed SG nozzle dam (which would be covered through AOP-031 implementation) are expected to stop draining the system before level fails low enough to entrain air in the RHR pump loop suctions and jeopardize RHR flow. A candidate could relate this information to the rapidly lowering RWST level and RHR suction problems when being supplied by the RWST.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

APE: 059 Accidential Liquid Radwaste Release / 9

059 AK3.04 Knowledge of the reasons for the following responses as they apply to the Accidental Liquid Radwaste Release: Actions contained in EOP for accidental liquid radioactive-waste release
(CFR 41.5,41.10 / 45.6 / 45.13)

Importance Rating:	3.8 4.3
Technical Reference:	AOP-008, Rev. 14 entry conditions and section 3.0 step 3 RNO caution, ALB-004-2-2
References to be provided:	None
Learning Objective:	Lesson Plan AOP3-8 Obj 1
Question Origin:	New
Comments:	We have AOP actions but Not EOP actions is an AOP question OK? 4/18/2013 Bruno says it is OK to write question to AOP since the EOP's don't have any releationship to liquid releases.
Tier/Group:	T1G2

24. Given the following plant conditions:
    - The unit was operating at 100% power when a LOCA occurred
    - An 86 Lockout occurs on the 'A' and 'B' SUTs
    - Sixty minutes later, the following plant conditions exist:

- RVLIS Full Range	63% and lowering
- Core Exit Thermocouples	745°F and rising
- Containment Pressure	21 psig and rising
- Pressurizer Level	0%
- SG NR level 'A'	38%
- SG NR level 'B'	44%
- SG NR level 'C'	23%

Based on these conditions, which ONE of the following completes the statement below?

The Core Cooling Critical Safety Function Status Tree requires entry into ___(1)___ AND the crew will depressurize the SGs to 130 psig using ___(2)___.

A. (1) FR-C.2, Response To Degraded Core Cooling

   (2) steam dumps

B. (1) FR-C.2, Response To Degraded Core Cooling

   (2) SG PORVs

C. (1) FR-C.1, Response To Inadequate Core Cooling

   (2) steam dumps

D. (1) FR-C.1, Response To Inadequate Core Cooling

   (2) SG PORVs

Reason answer is correct: Core exit TCs are > 730° and < 1200° with RVLIS full range > 39% therefore the core cooling would be considered "degraded" per CSF-2 Core Cooling. IF and when RVLIS full range level decreases to < 39% the core cooling would be considered inadequate. With the loss of off-site power the Circ water pumps would not have power and the Condenser would not be available. When the crew was determining to use either the steam dumps or PORVs to depressurize the SGs to 130 psig the choice would have to be the SG PORVs. Additionally, with the Containment pressure at 21 psig the MSIVs would have received an isolation signal therefore the steam dumps would not be available.

A. Incorrect. The first part is correct. The second part is plausible since the steam dump valves would be the first turbine bypass valves to be used IF they were available for use. In the case of loss of off-site power they would not be.

B. Correct.

C. Incorrect. Plausible since TCs make up one of the two conditions needed to consider that core cooling is inadequate. As RVLIS level continues to decrease if either TCs are not reduced to < 730°F or RVLIS level restored an inadequate core cooling condition will occur. The second part is plausible since the steam dump valves would be the first turbine bypass valves to be used IF they were available for use. In the case of loss of off-site power they would not be.

D. Incorrect. Plausible since TCs make up one of the two conditions needed to consider that core cooling is inadequate. As RVLIS level continues to decrease if either TCs are not reduced to < 730°F or RVLIS level restored an inadequate core cooling condition will occur. The second part is correct.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

EPE: 074 Inadequate Core Cooling / 4

074 EA2.03 Ability to determine or interpret the following as they apply to a Inadequate Core Cooling: Availability of turbine bypass valves for cooldown (CFR 43.5 / 45.13)

Importance Rating:	3.8 4.1
Technical Reference:	Core Cooling CSF-2 FR-C.2, rev 0
References to be provided:	None
Learning Objective:	Lesson Plan EOP-3.10 Obj 4
Question Origin:	New
Comments:	None
Tier/Group:	T1G2

25. Given the following plant conditions:
    - A Small Break LOCA has occurred
    - The crew is performing actions contained in ES-1.2, Post LOCA Cooldown and Depressurization

    Which ONE of the following describes why the Cold Leg Accumulators (CLA) are isolated?

    A. prevent CLA injection when the RCS depressurizes, resulting in thermal stress and PTS concerns from the cold water on the reactor vessel.

    B. Ensures that RCS pressure can be reduced to below RHR pump shutoff head, and further CLA injection will not occur.

    C. To prevent injecting the CLA nitrogen into the reactor and causing gas binding of the S/G U-tubes.

    D. Ensures that the inventory contained in the CLA's is available should the need arise to recover core cooling later in the procedure.

    Plausibility and Answer Analysis

    Reason answer is correct: *Condenser steam dumps are available because Containment pressure never rose above 3 psig and a MSLI never actuated to shut all MSIVs. Rate is correct per ES-1.2 step 10.a - Maintain cooldown rate in RCS cold legs to < 100°F/HR.*

    A. Incorrect. Plausible since SG PORVs would be used for cooldown if the condenser was not available. Cooldown rate is correct, ES-1.2 limits cooldown to 100°F/hour.

    B. Incorrect. Plausible since SG PORVs would be used for cooldown if the condenser was not available. The Cooldown Rate is incorrect. Other EOPs perform a max rate cooldown but ES-1.2 limits cooldown to 100°F/hour.

    C. Correct.

    D. Incorrect. Condenser steam dumps are available. The Cooldown Rate is incorrect. Other EOPs perform a max rate cooldown but ES-1.2 limits cooldown to 100°F/hour.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

EPE: E03 LOCA Cooldown and Depressurization / 4

WE03 EK1.1 Knowledge of the operational implications of the following concepts as they apply to the (LOCA Cooldown and Depressurization): Components, capacity, and function of emergency systems.
(CFR: 41.8 / 41.10 / 45.3)

Importance Rating:	3.4 4.0
Technical Reference:	ES-1.2 step 10, page 12, Rev. 0
References to be provided:	None
Learning Objective:	EOP-LP-3.5 Obj. 4
Question Origin:	Bank
Comments:	None
Tier/Group:	T1G2

26. Given the following plant conditions:
    - A Small Break LOCA has occurred
    - Containment pressure is currently 4.1 psig and stable
    - The crew is performing actions contained in E-0, Reactor Trip Or Safety Injection, Attachment 3, Safeguards Actuation Verification

    Which ONE of the following valves is expected to be OPEN for current plant conditions?

    A. 1BD-11, SG A Blowdown

    B. 1MS-266, MS Drain To Condenser

    C. 1SW-231, Service Water To NNS Fan Coils

    D. 1CC-297, CCW From RCP Bearing Oil Hxs

    Plausibility and Answer Analysis

    Reason answer is correct: Based on the plant conditions the with containment pressure below 10 psig the phase 'B' isolation signal has not been generated. Component cooling remains aligned to the RCPs to support their continued operation therefore 1CC-297 is in the proper positions for the current position

    A. Incorrect. Plausible because this valve is normally open at power and the event in progress is a LOCA inside containment therefore the SGs are not losing inventory, however safety injection has actuated due to containment pressure exceeding 3 psig and ESFAS isolates SG blowdown to conserve inventory.

    B. Incorrect. Plausible because this valve is normally open at power and the event in progress is a LOCA inside containment therefore the SGs are not losing inventory, however main steam line isolation has actuated due to containment pressure exceeding 3 psig and ESFAS isolates SGs to conserve inventory.

    C. Incorrect. Plausible because this valve is normally open at power, and the event in progress is a LOCA inside containment therefore the service water is supplied to the Containment Fan Coolers via the emergency service water header, however the containment phase 'A' isolation has actuated due to containment pressure exceeding 3 psig and ESFAS isolates service water to the NNS fan coils.

    D. Correct.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

APE: 069 Loss of CNMT Integrity / 5

WE14 EA1.1 Ability to operate and / or monitor the following as they apply to the (High Containment Pressure): Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
(CFR: 41.7 / 45.5 / 45.6)

Importance Rating:	3.7 3.7
Technical Reference:	E-0, rev 1, pg 55-56, Attachment 3 PLP-106, Rev 53, pg 20, 21 and 22
References to be provided:	None
Learning Objective:	ESFAS Student Text Rev. 3, Objective 4, 7 & 8.
Question Origin:	New
Comments:	
Tier/Group:	T1G2

27. Which ONE of the following identifies the sources of water that are evaluated for operational concern, associated with the maximum Containment water level in accordance with FR-Z.2, Response To Containment Flooding?

A. Condensate Storage Tank, Emergency Service Water, Reactor Coolant System

B. Emergency Service Water, Reactor Coolant System, Refueling Water Storage Tank

C. Condensate Storage Tank, Emergency Service Water, Refueling Water Storage Tank

D. Condensate Storage Tank, Reactor Coolant System, Refueling Water Storage Tank

Plausibility and Answer Analysis

Reason answer is correct: The maximum level of water in the containment following a major accident is based upon the entire water contents of the reactor coolant system, refueling water storage tank, condensate storage tank, and SI accumulators. This water volume approximates the maximum water volume introduced into the containment following a LOCA plus a steamline or feedline break inside containment.

A. Incorrect. Plausible because all three water sources are either normally inside containment or are automatically supplied to containment in the event of a LOCA, SGTR or Faulted SG.

B. Incorrect. Plausible because all three water sources are either normally inside containment or are automatically supplied to containment in the event of a LOCA, SGTR or Faulted SG.

C. Incorrect. Plausible because all three water sources are either normally inside containment or are automatically supplied to containment in the event of a LOCA, SGTR or Faulted SG.

D. Correct.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

EPE: E15 Containment Flooding / 5

WE15 EK3.1 Knowledge of the reasons for the following responses as they apply to the (Containment Flooding): Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.
(CFR: 41.5 / 41.10, 45.6, 45.13)

Importance Rating:	2.7 2.9
Technical Reference:	WOG Background Document, FR-Z.2, rev 2, pg 2
References to be provided:	None
Learning Objective:	Lesson plan EOP-LP-3.13, rev 9, obj 1.b
Question Origin:	New
Comments:	None
Tier/Group:	T1G2

28. Given the following plant conditions:
    - A plant cooldown is in progress
    - The following conditions exist for RCP 'B'

Time	Thrust Bearing Temperature	# 1 Seal Differential Pressure
0800	154°F	253 psig
0805	159°F	237 psig
0810	165°F	223 psig
0815	174°F	209 psig
0820	183°F	198 psig

Which ONE of the following completes the statement below?

The ___(1)___ limit is not being maintained AND the operator is required to stop the RCP 'B' in accordance with ___(2)___.

A. (1) Thrust Bearing Temperature

   (2) GP-007, Normal Plant Cooldown Mode 3 To Mode 5

B. (1) Thrust Bearing Temperature

   (2) AOP-018, Reactor Coolant Pump Abnormal Conditions

C. (1) # 1 Seal Differential Pressure

   (2) GP-007, Normal Plant Cooldown Mode 3 To Mode 5

D. (1) # 1 Seal Differential Pressure

   (2) AOP-018, Reactor Coolant Pump Abnormal Conditions

Plausibility and Answer Analysis

Reason answer is correct:

A. *Incorrect. The first part is plausible because the RCP is approching the AOP-018 RCP trip criteria of 190°F but it has not been reached. The second part is correct.*

B. *Incorrect. The first part is plausible because the RCP is approaching the AOP-018 RCP trip criteria of 190°F but it has not been reached. The second part is plausible because the motor thrust bearing is a component that has a trip limit identified in AOP-018, but the APP requires conformation of motor trouble by the use of bearing water temperature or pump vibrations.*

C. *Correct.*

D. *Incorrect. The first part is correct. The second part is plausible because the motor thrust bearing is a component that has a trip limit identified in AOP-018, but the APP requires conformation of motor trouble by the use of bearing water temperature or pump vibrations.*

ALB-08, 4-2

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

003 Reactor Coolant Pump

abnormal vs normal RCP ↓D

003 A2.02 Ability to (a) predict the impacts of the following malfunctions or operations on the RCPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Conditions which exist for an abnormal shutdown of an RCP in comparison to a normal shutdown of an RCP (CFR: 41.5 / 43.5/ 45.3 / 45/13)

Importance Rating:	3.7 3.9
Technical Reference:	GP-007, rev 61, pg 12, P&L 22
References to be provided:	None
Learning Objective:	Lesson plan GP-LP-3.7, rev 6, obj 1
Question Origin:	New
Comments:	None
Tier/Group:	T2G1

29. Given the following plant conditions:
    - A Large Break LOCA has occurred
    - ALB-004-2-4, Refueling Water Storage Tank 2/4 Low Low Level, annunciator was received several minutes ago
    - RWST level indicates 22% and continues to lower

    In accordance with ES-1.3, Transfer to Cold Leg Recirculation, which ONE of the following actions completes the statement below to establish the 'A' CSIP suction source for continued long term operation?

    1RH-1 and 1CS-746 must be ___(1)___ then open ___(2)___ .

    1RH-1, RCS Loop A to RHR Pump A-SA
    1CS-746, CSIP A Alternate Miniflow Relief to RWST
    1RH-25 SA, Suction From RHR Heat Exchanger A-SA
    1SI-340, Safety Injection A train to Cold Leg

    A. (1) closed
       (2) 1RH-25

    B. (1) closed
       (2) 1SI-340

    C. (1) opened
       (2) 1RH-25

    D. (1) opened
       (2) 1SI-340

Reason answer is correct: RHRS to CSIP Suction Isolation Valves 1RH-25, 1RH-63:

The CSIP suction isolation valves are interlocked to allow their manual opening only when BOTH of the following conditions exist:

- At least one of the two RHRS inlet isolation valves on the same train associated with the CSIP suction isolation valve is closed. For instance, either 1RH-1 or 1RH-2, or both, must be closed in order to open 1RH-25.
- At least one of the two isolation valves for the same train in each CVCS alternate miniflow line is closed. For instance, either 1CS-745 or 1CS-746, or both, must be closed in order to open 1RH-25

This interlock with the RCS suction valves is based on preventing cross-connection of the RHR and CVCS suction piping during normal cooldown or heat-up and preventing over pressurization of the CSIP suction piping. The interlock with the miniflow valves is to ensure that post-accident recirculation water from the containment sumps does not enter the RWST (radiological release).

A. Correct.

B. Incorrect. The first part is correct. The second part is plausible because 1SI-340 or 1SI-341 are verified open during the performance of cold leg recirculation alignment as a discharge from the RHR pump and the one valve is shut to prevent runout of the remaining RHR pump if one pump were to trip .

C. Incorrect. Plausible because if 1RH-1 and 1CS-746 were closed this would be correct.

D. Incorrect. Plausible because if 1RH-1 and 1CS-746 were closed this would be correct. 1SI-340 is normally open and is downsteam of the cross tie header for the RHR discharge on the A train and if this valve where located on the upstream side of this cross-tie header it would be required to stay open to allow the RHR pump discharge to flow to the suction of the charging pump.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

004 Chemical and Volume Control System

004 A2.13 Ability to (a) predict the impacts of ~~the following~~ malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Low RWST level (CFR: 41.5 / 43/5 / 45/3 / 45/5)

Importance Rating:	3.6 3.9
Technical Reference:	EOP-ES-1.3 Rev. 0 page 8
References to be provided:	None
Learning Objective:	RHR Student Text Obj 7.d
Question Origin:	New
Comments:	None
Tier/Group:	T2G1

30. Given the following plant conditions:
    - The unit was operating at 100% power
    - ALB-007-4-3, VCT High-Low Level is in Alarm
    - VCT level transmitter LI-115 reads 100% and LI-112 reads 21%

    Which ONE of the following completes the statement below concerning the VCT level event in progress?

    In accordance with ALB-007-4-3 and AOP-003, Malfunction Of Reactor Makeup Control, gas binding of the running CSIP is a concern when VCT Level reaches ___(1)___ . To prevent the possibility of this gas intrusion ___(2)___ .

    1CS-291, Suction from RWST LCV-115B
    1CS-292, Suction from RWST LCV-115D
    1CS-165, VCT Outlet LCV-115C
    1CS-166, VCT Outlet LCV-115E

    A. (1) 5%

       (2) RWST suction valves will open and VCT outlet valves will shut automatically

    B. (1) 5%

       (2) RWST suction valves will be opened and VCT outlet valves will be shut from the MCB

    C. (1) 15%

       (2) RWST suction valves will open and VCT outlet valves will shut automatically

    D. (1) 15%

       (2) RWST suction valves will be opened and VCT outlet valves will be shut from the MCB

Reason answer is correct: VCT level should be maintained on scale to prevent gas intrusion to the CSIP's, because the automatic fucntion is defeated with LI-115 failed high the student must manually algin the RWST as a suction source and isolate the VCT to ensure level is maintained on scale.

A. *Incorrect. The first part is correct. The second part is plausible since the RWST suction valves will automatically open when VCT level is <5% on 2 of 2 VCT level channels. In this case LT-115 has failed high and an automatic swap over will not occur until after Maintenance lifts and taps the cables associated with the failing instrument. Lifting leads causes a simulated low-low level signal from the failed instrument. This allows a valid low-low level signal from the good instrument ot initiate emergency makeup from the RWST.*

B. *Correct.*

C. *Incorrect. The first part is plausible since 15% is the VCT High-Low level alarm setpoint. The second part is plausible since the RWST suction valves will automatically open when VCT level is <5% on 2 of 2 VCT level channels. In this case LT-115 has failed high and an automatic swap over will not occur until after Maintenance lifts and taps the cables associated with the failing instrument. Lifting leads causes a simulated low-low level signal from the failed instrument. This allows a valid low-low level signal from the good instrument ot initiate emergency makeup from the RWST.*

D. *Incorrect. The first part is plausible since 15% is the VCT High-Low level alarm setpoint. The second part is correct.*

SOER 97-1 potential gas intrusion into the suction of the CSIP's.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

004 Chemical and Volume Control System

004 K5.26 Knowledge of the operational implications of the following concepts as they apply to the CVCS: Relationship between VCT pressure and NPSH for charging pumps (CFR: 41.5/ 45.7)

Importance Rating:	3.1 3.2
Technical Reference:	AOP-003, Section 3.1, step 15, page 3, Rev. 28 and ALB-007-4-3 Rev. 15, CVCS student text; level instrumentation
References to be provided:	None
Learning Objective:	CVCS Objective 3.c
Question Origin:	New
Comments:	Bruno says: Question could be written from AOP-003 to test the level at which gas intrusion to the CSIP's could take place 5% or 15% 2 part question go to annunciator procedure when alarm comes in and test knowlege of AOP-003 actions and APP?
Tier/Group:	T2G1

31. Which ONE of the following identifies (1) the MINIMUM CNMT wide range sump level required to place the RHR system in Cold Leg Recirculation in accordance with ES-1.3, Transfer To Cold Leg Recirculation AND (2) the reason for this level?

A. (1) 137.5 inches

(2) ensures the recirculation sump strainers are completely submerged and assures a long term recirculation suction source

B. (1) 137.5 inches

(2) ensures the recirculation sump pH level will remain in the acceptable post accident band

C. (1) 142 inches

(2) ensures the recirculation sump strainers are completely submerged and assures a long term recirculation suction source

D. (1) 142 inches

(2) ensures the recirculation sump pH level will remain in the acceptable post accident band

Reason answer is correct: Following a LOCA large enough to require transfer to the recirculation phase of the ECCS, containment water level is expected to be above the strainer modules ("top hats") and the vortex breakers located inside the recirculation sump (Design calculations for the limiting case predict a water level of 223 FEET, 8 INCHES, approximately 142 INCHES as read on the wide range containment sump level instruments or 87% as read on the recirculation sump narrow range level instruments.). Degraded sump performance could only occur if water level fell below this level or the strainer modules experienced excessive clogging.

A. Incorrect. *The first part is plausible because both the RHR pumps and the Containment Spray pumps take a suction from the containment sump and the level is the correct amount to allow the Containment Spray pumps to take a suction from the recirculation sump. The second part is correct.*

B. Incorrect. *The first part is plausible because both the RHR pumps and the Containment Spray pumps take a suction from the containment sump and the level is the correct amount to allow the Containment Spray pumps to take a suction from the recirculation sump. The second part is plausible since both the Containment Spray and RHR systems will be in operation for a LOCA event in which the RWST is depleted to the point that shifting suctions the to the Containment Sump is required. With Containment Spray in operations the Spray Additive tank will be part of the suction supply to the pump. It is reasonable to believe that the sodium hydroxide in the tank requires a minimum amount of water level to ensure that the chemicals when mixed with the LOCA water in the Containment sumps combine to maintain the correct pH level.*

C. *Correct.*

D. Incorrect. *The first part is correct. The second part is plausible since both the Containment Spray and RHR systems will be in operation for a LOCA event in which the RWST is depleted to the point that shifting suctions the to the Containment Sump is required. With Containment Spray in operations the Spray Additive tank will be part of the suction supply to the pump. It is reasonable to believe that the sodium hydroxide in the tank requires a minimum amount of water level to ensure that the chemicals when mixed with the LOCA water in the Containment sumps combine to maintain the correct pH level.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

005 Residual Heat Removal System (RHRS)

005 A1.05 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RHRS controls including: Detection of and response to presence of water in RHR emergency sump (CFR: 41.5 / 45.5)

Importance Rating:	3.3 3.3
Technical Reference:	ES-1.3, Rev 0, pg 4
References to be provided:	None
Learning Objective:	Lesson plan EOP-LP-2.3/3.3, rev 9, obj 5.c
Question Origin:	New
Comments:	None
Tier/Group:	T2G1

32. Which ONE of the following completes the statements below concerning replacing the 'B' CSIP with the 'C' CSIP, in accordance with OP-107, Chemical and Volume Control System?

A manual transfer switch located in the RAB ___(1)___ must be operated.

To align the 'C' CSIP manual transfer switch to 1B-SB, rotate the B Train Kirk Key Lock then ___(2)___ .

A. (1) 236' just south of the CSIP A room

(2) close the control power knife switch

B. (1) 236' just south of the CSIP A room

(2) place the operating handle into the handle casting and close the switch

C. (1) 286' Switchgear room

(2) close the control power knife switch

D. (1) 286' Switchgear room

(2) place the operating handle into the handle casting and close the switch

Reason answer is correct: *CSIPs 1A SA and 1B SB receive power from their associated train buses. However, power for the CSIP 1C SAB can be aligned to either train's 6.9 kV emergency bus racking in the supply breaker at the desired bus and by using a throw-over switch located on the 236-foot elevation of the RAB just south of the CSIP A room. To align the C CSIP Manual Transfer Switch to 1B-SB the Kirk Key is placed in the B Train Kirk Key Lock and rotated to allow closing the B Train switch. Then an operating handle is placed into the B Train handle casting and the switch is closed.*

A. *Incorrect. The first part is correct. The second part is plausible since this operation is what is performed as the final step of racking in a 6.9KV breaker to allow the charging sprins to charge and prepare the breaker for remote operation. (OP-156.02 section 5.13.2)*

B. *Correct.*

C. *Incorrect. The first part is plausible since this is where the physical location of the breaker for the 'C' CSIP resides. The second part is plausible since this operation is what is performed as the final step of racking in a 6.9KV breaker to allow the charging sprins to charge and prepare the breaker for remote operation. (OP-156.02 section 5.13.2)*

D. *Incorrect. The first part is plausible since this is where the physical location of the breaker for the 'C' CSIP resides. The second part is correct.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

006 Emergency Core Cooling System (ECCS)

006 G2.1.30 Ability to locate and operate components, including local controls. (CFR: 41.7 / 45.7)

Importance Rating:	4.4 4.0
Technical Reference:	OP-107 Attachment 5, Page 141, Rev. 96
References to be provided:	None
Learning Objective:	CVCS Student Text Objective 12. d
Question Origin:	New
Comments:	None
Tier/Group:	T2G1

33. Given the following plant conditions:
    - The unit is operating at 100% power
    - ALB-009-8-1, Pressurizer Relief Tank High-Low Level Press Or Temp, Alarms
    - PRT temperature indicates 101°F
    - PRT pressure indicates 8 psig
    - PRT level indicates 73%

    Which ONE of the following (1) identifies the cause of the alarm AND (2) describes the required action for this alarm in accordance with the Annunciator Panel Procedure and OP-100, Reactor Coolant System?

    A. (1) PRT level is high

       (2) Vent the PRT to the Waste Gas Vent Header

    B. (1) PRT level is high

       (2) Drain the PRT to the Waste Hold Tank

    C. (1) PRT pressure is high

       (2) Vent the PRT to the Waste Gas Vent Header

    D. (1) PRT pressure is high

       (2) Drain the PRT to the Waste Hold Tank

Reason answer is correct: The alarm setpoint for the PRT high pressure alarm is 8 psig which is currently the only input that is at the alarm setpoint. In accordance with APP-ALB-009-8-1 with the PRT pressure high and the temperature normal the operator is direct to vent the PRT per OP-100.

A. *Incorrect. The first part is plausible because the level is at the high end of the normal operating band of 69 to 74%, but is below the high level alarm setpoint of 83%. The second part is correct.*

B. *Incorrect. The first part is plausible because the level is at the high end of the normal operating band of 69 to 74%, but is below the high level alarm setpoint of 83%. The second part is plausible because it is the correct action to lower the level of the PRT.*

C. *Correct.*

D. *Incorrect. The first part is correct. The second part is plausible because as the level is increased the nitrogen cover gas is compressed resulting in a higher pressure inside the PRT, therefore draining the PRT will allow the nitrogen cover gas to expand and lower the PRT pressure.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

007 Pressurizer Relief Tank/Quench Tank System (PRTS)

007 G2.1.20 Ability to interpret and execute procedure steps.
(CFR: 41.10 / 43.5 / 45.12)

Importance Rating:	4.6 4.6
Technical Reference:	APP-ALB-009-8-1, Rev 15, pg 29 OP-100, Rev 37, pg 15
References to be provided:	None
Learning Objective:	PZR Student Text, Rev 6, Obj 6
Question Origin:	New
Comments:	None
Tier/Group:	T2G1

34. ALB-009-8-1, Pressurizer Relief Tank High-Low Level Press or Temp, alarms due to a high temperature condition

In accordance with ALB-009-8-1 and OP-100, Reactor Coolant System, which ONE of the following describes how the PRT will be cooled?

(Assume a rapid cooldown will NOT be required)

A. Recirculate the PRT through the RCDT heat exchanger, using CCW to cool the heat exchanger

B. Recirculate the PRT through the RCDT heat exchanger, using SW to cool the heat exchanger

C. Drain the PRT to the RCDT while making up to the PRT from the DWST

D. Drain the PRT to the RCDT while making up to the PRT from the RMWST

Plausibility and Answer Analysis

Reason answer is correct: Normal cooling of the PRT is accomplished by recirculating the PRT water through the RCDT heat exchanger, which is cooled by CCW.

A. Correct.

B. Incorrect. Plausible since normal cooling of the PRT is accomplished by recirculating the PRT water through the RCDT heat exchanger, but it is cooled by CCW, not SW.

C. Incorrect. Plausible because this is a method to cooldown the PRT but this method is a rapid cooldown method. A rapid cooldown of the PRT would occur when the PRT is aligned for draining through the RCDT pumps and simultaneously making up to the PRT, but the makeup source is from the RMUW, not the DWST.

D. Incorrect. Plausible because this is a method to cooldown the PRT but this method is a rapid cooldown method. The question asks for a method that is NOT a rapid cooldown method.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

007 Pressurizer Relief Tank/Quench Tank System (PRTS)

007 K4.01 Knowledge of PRTS design feature(s) and/or interlock(s) which provide for the following: Quench tank cooling
(CFR: 41.7)

Importance Rating:	2.6 2.9
Technical Reference:	APP-ALB-009, rev 15, pg 29 OP-100, rev 37, pg 40, Section 8.5 Student text for PZR and CCW systems
References to be provided:	None
Learning Objective:	PZR-3.0-3
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G1

35. Which ONE of the following CCW System loads are DIRECTLY isolated from the CCW System as a result of a Safey Injection signal?

A. Primary Sample Panel AND Gross Failed Fuel Detector

B. RCDT heat exchanger AND Excess Letdown heat exchanger

C. RCDT heat exchanger AND Gross Failed Fuel Detector

D. Primary Sample Panel AND Excess Letdown heat exchanger

Plausibility and Answer Analysis

Reason answer is correct: *An SI signal will isolate the Gross Failed Fuel Detector CCW valves 1CC-304 and 1CC-305. Additionally, the signal will also shut Primary Sample CCW valves 1CC-114 and 1CC-115. The SI signal also causes a Phase A isolation signal to be generated. On a Phase A signal the CCW valve 1CC-176 to the RCDT heat exchanger and Excess Letdown heat exchanger receives a shut signal thus isolating the CCW to both the associated heat exchangers.*

A. Correct.

B. Incorrect. Plausible since the RCDT and Excess Letdown heat exchangers CCW 1CC-176 shuts on a SI generated Phase A signal not directly from the SI.

C. Incorrect. The RCDT heat exchanger CCW isolation valve 1CC-176 receives a Phase A signal. The Gross Failed Fuel Detector is correct.

D. Incorrect. The Priamary Sample Panel is correct and the Excess Letdown heat exchanger is plausible since the CCW isolation valve 1CC-176 receives a Phase A isolation signal.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

008 Component Cooling Water System (CCWS)

008 A3.08 Ability to monitor automatic operation of the CCWS, including: Automatic actions associated with the CCWS that occur as a result of a safety injection signal (CFR: 41.7 / 45.5)

Importance Rating:	3.6 3.7
Technical Reference:	Simplified flow diagrams 5-S-1319, 1321 and 1322 indicating either a 'S' signal (for Safety Injection) or a 'T' signal (Phase A) isolate CCW to each component
References to be provided:	None
Learning Objective:	Lesson Plan CCW Objective 7.e
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G1

36. Given the following plant conditions:
    - The unit is operating at 100% power
    - PZR Pressure Channel (PT-445) instantaneously fails high

    Which ONE of the following completes the statement below describing the response of the PZR Pressure Control System to this failure?

    ___(1)___ PZR PORV(s) will OPEN and remain OPEN until ___(2)___ actuates.

    A. (1) ONE

       (2) Safety Injection

    B. (1) ONE

       (2) P-11, PZR High Pressure

    C. (1) TWO

       (2) Safety Injection

    D. (1) TWO

       (2) P-11, PZR High Pressure

    Plausibility and Answer Analysis

    Reason answer is correct: *Two PORVs are controlled by PT-445 and P-11 (RCS pressure < 2000 psig 2/3 channels) closes PORVs that are open in auto.*

    A. Incorrect. This is plausible because PT-444 controls one Pressurizer PORV but P-11 will close PORVs that are open in auto.

    B. Incorrect. This is plausible because PT-444 controls one Pressurizer PORV. The P-11 part is correct because 2/3 protection channels < 2000 psig (P-11) closes PORVs that are open in auto.

    C. Incorrect. This is plausible because two PORVs are controlled by PT-445 but P-11 will close PORVs that are open in auto.

    D. Correct.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

010 Pressurizer Pressure Control System (PZR PCS)

010 K6.02 Knowledge of the effect of a loss or malfunction of the following will have on the PZR PCS: PZR
(CFR: 41.7 / 45.7)

Importance Rating:	3.2 3.5
Technical Reference:	ALB-009-3-1, rev 15, pg 10, and window 5-5, pg 22
References to be provided:	None
Learning Objective:	Lesson Plan PZRPC Obj. 8.i
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G1

37. Given the following plant conditions:
    - The unit is at 100% power
    - The Pressurizer pressure master controller, PK-444A, is in AUTOMATIC
    - The Pressurizer pressure master controller setpoint is slowly adjusted to 61%

    Which ONE of the following is the expected plant response to the setpoint adjustment?

    A. Both spray valves should open

    B. The control heaters should be at maximum output

    C. Pressure should stabilize at approximately 2280 psig

    D. One PZR PORV should be cycling to maintain pressure

    Plausibility and Answer Analysis

    Reason answer is correct: *The Master Pressure Controller (MPC) operates in Automatic to control RCS pressure to a setpoint determined by the Operator and set on the left-hand scale on the MPC. Since the MPC setpoint control range is from 1700 psig to 2500 psig (800psig band), the setpoint may need to be changed to reflect the desired RCS pressure. For instance, if the Operator desires to control RCS pressure at 2200 psig, the MPC setpoint would be set to a value calculated by the following: (Desired pressure - 1700 psig) / 800 psig or 62.5%. The nominal setpoint at power is 67% to control the RCS pressure at 2235 psig.*

    (2235 - 1700 / 800 = 0.66875 x 100 = approximately 67%)

    NOTE the values provided in the answer analysis are based on the controller setpoint of 61%.

    Controller setpoint of 61% achieves a ~~normal~~ pressure of 2188 psig. (Normal at power pressure is 2235 psig.) Spray valves should generally open approximately 25 psig above normal setpoint (2213 psig). This is just outside normal operating pressure enough that there should be no question that at least the spray valves should open, but not be drastic enough to challenge the PORVS openning. The word "slowly" is in the stem to preclude the PORVs opening from quick operation of the controller.

    The control switch for the group C heaters controls the power supply breaker. The control heaters output is controlled by the PRZ master pressure controller output signal. They will be full on when the error signal output of the PRZ master pressure controller corresponds to a difference between actual pressure and reference pressure (2235 psig) of -15 psi, or for this question 2173 psig. Conversely, the control heaters will be full off when the error signal is +15 psi, or for this question 2203 psig. Between the high and low error from reference pressure, the heater output varies linearly.

    Control switches for the backup heaters (groups A, B, and D) have three positions (OFF, AUTO, ON). In AUTO, the backup heaters are controlled via the PRZ master

master pressure controller corresponds to -25 psig below normal setpoint (2163 psig) and decreasing, and full off at -17 psi (2171 psig) and increasing. Since pressure is currently 2235 psig prior to the controller adjustment the control group heaters should be full off with the new setpoint.

A. Correct.

B. Incorrect. Plausible if candidate thinks that the adjustment to the controller made the actual pressure increase instead of decrease.

C. Incorrect. Plausible if candidate thinks that the adjustment to the controller made the actual pressure increase instead of decrease.

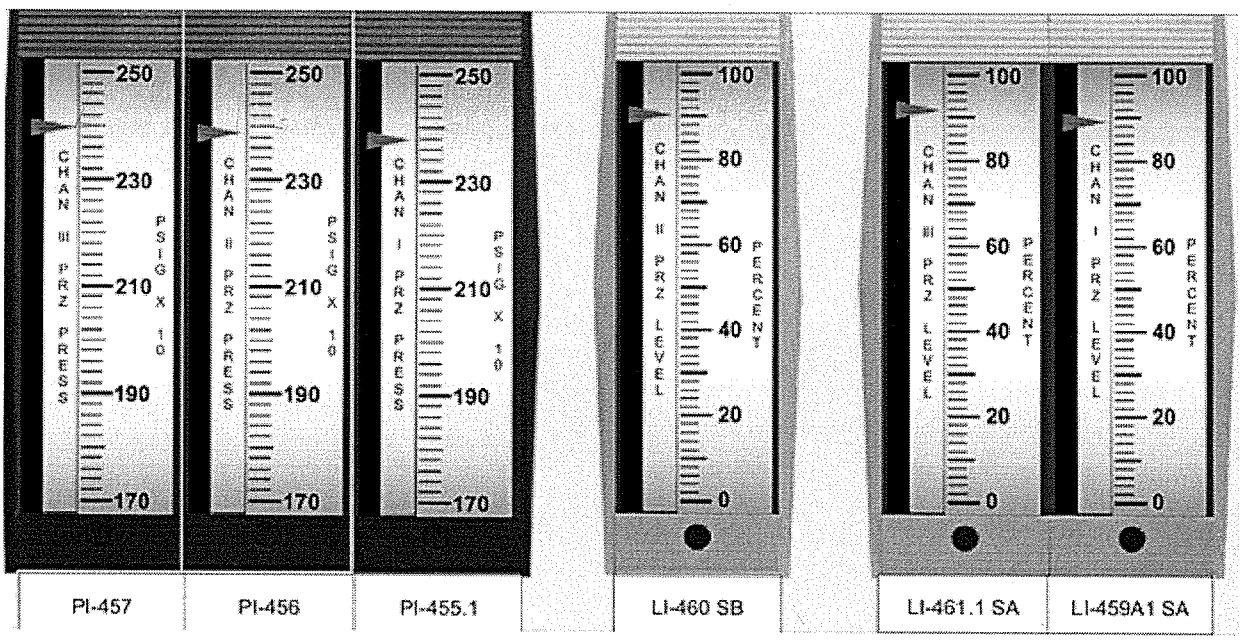
D. Incorrect. Plausible if controller quickly taken to this new setpoint one PORV (1RC-114, PCV-444B) could get a signal to open.

010 Pressurizer Pressure Control System (PZR PCS)

010 K6.03 Knowledge of the effect of a loss or malfunction of the following will have on the PZR PCS: PZR sprays and heaters
(CFR: 41.7 / 45.7)

Importance Rating:	3.2 3.6
Technical Reference:	AOP-019, Attachment 1, page 18, Rev. 24 and Student Text for Pressurizer Pressure Control
References to be provided:	None
Learning Objective:	PRZPC Objective 4.b
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G1

38. Given the following plant conditions:
    - The plant was operating at 8% power when the following parameters are indicated prior to the Reactor automatically tripping:



Which ONE of the following (1) identifies the condition that caused the automatic Reactor trip AND (2) the associated basis for the automatic trip?

A. (1) PZR High Level

   (2) provides protection against over pressurizing the RCS.

B. (1) PZR High Level

   (2) provides protection against water relief through the Pressurizer safety valves.

C. (1) PZR High Press

   (2) provides protection against over pressurizing the RCS.

D. (1) PZR High Press

   (2) provides protection against water relief through the Pressurizer safety valves.

Reason answer is correct: 2/3 PZR Pressure channels have exceeded the 2385 psig Rx trip setpoint. This is a actuates an automatic Reactor trip. PZR High level trip of 92% on 2/3 channels is blocked automatically when reactor power is below P-7 (10% reactor power or 10% turbine power). The High Setpoint trip functions in conjunction with the pressurizer relief and safety valves to protect the Reactor Coolant System against system overpressure.

A. *Incorrect. The first part is plausible because 1 out of 3 is the logic for the Pressurizer High Level Alert which does not result in a Reactor trip. The second part is plausible because if the PZR were to go solid the pressure would rise.*

B. *Incorrect. The first part is plausible because 1 out of 3 is the logic for the Pressurizer High Level Alert which does not result in a Reactor trip. The basis for the Reactor trip is correct.*

C. *Correct.*

D. *Incorrect. The first part is correct. The second part is plausible because if the PZR were to go solid the pressure would rise until a PZR safety would lift an release water via the safety.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

012 Reactor Protection System (RPS)

012 K4.02 Knowledge of RPS design feature(s) and/or interlock(s) which provide for the following:Automatic reactor trip when RPS setpoints are exceeded for each RPS function; basis for each
(CFR: 41.7)

Importance Rating:	3.9 4.3
Technical Reference:	APP-ALB-012-1-1, pg 3, Rev 10 RPS Student text, pg 29, Rev 8 Technical Specification Safety Limit bases, pg B 2-5
References to be provided:	None
Learning Objective:	RPS Student text obj 12.d
Question Origin:	New
Comments:	None
Tier/Group:	T2G1

39. Given the following plant conditions:
    - The crew is responding to a Large Break LOCA in E-1, Loss Of Reactor Or Secondary Coolant
    - SI and Phase A have both been reset
    - Instrument Air and Nitrogen have been restored to Containment
    - Subsequently, a loss of offsite power occurs

Which ONE of the following identifies the required actions?

A. Manually restart both CSIPs after load block 9

B. Manually restart both RHR pumps after load block 9.

C. Verify both CSIPs AND RHR pumps start as designed on sequencer program B

D. Verify both CSIPs AND RHR pumps start as designed on sequencer program C

Plausibility and Answer Analysis

Reason answer is correct: The RHR pumps will be started during a LOCA from safeguards sequencer program C (LOCA). The SI signal that starts sequencer program C has been reset when the SI signal was reset. The subsequent loss of offsite power would result in a loss of power to the RHR pumps. The loss of power starts the sequencer in program A which does NOT send a signal to restart the RHR pumps. Since the RHR pumps would be required to be in operation for the LOCA the operator must wait for load block 9 to be completed to prevent overloading the EDG powering the emergency bus and then manually restart both RHR pumps.

A. Incorrect. Plausible since both CSIPs would have lost power when offsite power was lost but the CSIPs would be sequenced on from sequencer program A.

B. Correct.

C. Incorrect. Plausible since sequencer program B runs with both LOCA and Loss of Offsite power but since the SI signal is reset sequencer program A will run and the RHR pumps do NOT recieve a start signal from this sequencer program. The term "verify" means to observe the condition, and if it is not satisfied, attempt to satisfy it using whatever means are available.

D. Incorrect. Plausible since both CSIPs and RHR pumps would get a start signal from sequencer program C except in this case ONLY sequencer program A would operate since this is a Loss of Offsite power after SI has been reset. The term "verify" means to observe the condition, and if it is not satisfied, attempt to satisfy it using whatever means are available.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

013 Engineered Safety Features Actuation System (ESFAS)

013 A4.01 Ability to manually operate and/or monitor in the control room: ESFAS-initiated equipment which fails to actuate
(CFR: 41.7 / 45.5 to 45.8)

Importance Rating:	4.5 4.8
Technical Reference:	E-0 and E-1 multiple steps stating to manually realign Safeguards equipment following a Loss of Offsite Power referring to E-0 attachment 6, Safeguards sequencer logic for Programs A and C
References to be provided:	None
Learning Objective:	EOP-3.1 Objective 5.c
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G1

40. Which ONE of the following completes the statement below?

A loss of Instrument Buses ___(1)___ AND ___(2)___ will result in the loss of BOTH 'A' AND 'B' Train ESFAS functions driven by slave relays for that train.

A. (1) SI

(2) SII

B. (1) SII

(2) SIII

C. (1) SI

(2) SIV

D. (1) SIII

(2) SIV

Plausibility and Answer Analysis

Reason answer is correct: *Train ESFAS slave relays are powered from Instrument Bus SI (SIV). A loss of SI or SIV will result in a loss of ESFAS functions driven by slave relays for that train.*

A. Incorrect *Plausible since the ESFAS relays are powered from the safety instrument buses. If SI or SIII is lost, the MCB controller for MDAFW pump flow control valves will not be operable; flow control valves will not shut on an AFW isolation signal and will not open on an auto open signal. Train ESFAS slave relays are powered from Instrument Bus SI (SIV). A loss of SI or SIV will result in a loss of ESFAS functions driven by slave relays for that train. A loss of SI will cause a loss of 'A' Train ONLY the question is asking for BOTH 'A' and 'B' Train.*

B.Incorrect *Plausible since the ESFAS relays are powered from the safety instrument buses. If power is lost to Instrument Bus SII (B Train and TDAFW) or SIII (A Train) the associated AFW pump suction pressure instrument will read low. If the AFW pump is running, it will not trip on Lo-Lo suction pressure nor will it be prevented from being started. Additionally, if power is lost to Instrument Bus SII (B Train) or SIII (A Train), the associated CNMT Spray Additive Tank level indicators will read empty but their associated CNMT Spray Chemical Addition Valve will not automatically shut. If necessary, the valve(s) may be manually operated.*

C.Correct

D. Incorrect *Plausible since the ESFAS slave relays are powered from Instrumtment Bus SI (SIV). To answer this question it would take BOTH SI and SIV and only one of the two (SIV) are listed. If power is lost to Instrument Bus SII (B Train and TDAFW) or SIII (A Train) the associated AFW pump suction pressure instrument will read low. If the AFW pump is running, it will not trip on Lo-Lo suction pressure nor will it be prevented from being started. Train ESFAS slave relays are powered from Instrument Bus SI (SIV). A loss of SI or SIV will result in a loss of ESFAS functions driven by slave relays for that train.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

013 Engineered Safety Features Actuation System (ESFAS)

013 K2.01 Knowledge of bus power supplies to the following: ESFAS/safeguards equipment control
(CFR: 41.7)

Importance Rating:	3.6 3.8
Technical Reference:	AOP-024-BD Rev. 19, page 2 Discussion #5
References to be provided:	None
Learning Objective:	ESFAS Obj. 2
Question Origin:	Bank
Comments:	KA is met by requiring the applicant to identify the power supplies to ESFAS equipment. Rearranged answers from original bank question to place in numarical order.
Tier/Group:	T2G1

41. Given the following plant conditions:
    - The plant was operating at 100% power
    - A RCS leak into Containment is occurring
    - Containment cooling is in normal cooling mode
    - Containment pressure is 2.6 psig and rising
    - Containment temperature is 135°F and rising

    Which ONE of the following completes the statement below?

    Containment Fan Coolers are running in ___(1)___ speed with the post-accident dampers ___(2)___.

    A. (1) SLOW

       (2) OPEN

    B. (1) SLOW

       (2) SHUT

    C. (1) HIGH

       (2) SHUT

    D. (1) HIGH

       (2) OPEN

    Plausibility and Answer Analysis

    Reason answer is correct: *Upon receipt of a SI signal each containment fan cooler will start in slow speed and the post accident damper will automatically open if either of the associated fans are running in slow speed. Since the automatice SI signal occurrs when 2/3 Containment Pressure transmitters are > 3.0 psig and current Containement pressure has remained below this setpoint the fans have NOT changed from the normal at power lineup. This lineup would have the Containment Fan Coolers in FAST speed and the post-accident dampers would be SHUT.*

    A. Incorrect. The first part is plausible since the indications are that a Small Break LOCA has occurred and Containment temperature is > 118°F. The fans would either automatically shift to slow speed or be manually placed in slow speed based on either the SI signal. Additionally, when the fans are started for NORMAL operation they are first started in SLOW speed. The second part is plausible because the dampers would automatically shift to OPEN with either the SI or High temperature alignment.

    B. Incorrect. The first part is plausible since a SI signal would cause the fans to shift to SLOW or they would be shifted to slow manually based on High

Containment Temperature (> 118°F). Additionally, when the fans are started for NORMAL operation they are first started in SLOW speed. The second part is plausible since the dampers are shut in the normal operating mode.

C. Correct.

D. Incorrect. The first part is correct. The second part is plausible since Containment Temperature is High (> 118°F) and the fans would be placed into a lineup where the dampers would open.

Previous version of this question below:

Given the following plant conditions:
- The plant was operating at 100% power
- A Small Break LOCA has occurred
- Containment pressure is 3.8 psig and rising
- Containment temperature is 137°F and rising

Which ONE of the following completes the statement below?

Containment Fan Coolers will be running in ___(1)___ speed with the post-accident dampers ___(2)___.

A. (1) SLOW
(2) OPEN

B. (1) SLOW
(2) SHUT

C. (1) HIGH
(2) SHUT

D. (1) HIGH
(2) OPEN

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

022 Containment Cooling System (CCS)

022 A4.03 Ability to manually operate and/or monitor in the control room: Dampers in the CCS
(CFR: 41.7 / 45.5 to 45.8)

Importance Rating:	3.2 3.2
Technical Reference:	OP-169, Section 5.1 Start Up of Containment Fan Cooler Units (Normal Cooling Mode), Rev. 23, Student text for CCS for NORMAL Coolding Mode (Containment Temp. < 118°F)
References to be provided:	None
Learning Objective:	Containment Cooling System Objective 3
Question Origin:	Modified 2012 NRC Exam, RO 41 by changing the Containment pressure conditions and stating that only automatic actions have been completed. By doing so the answer is now 'C' instead of 'A'. This change also changes which lesson plan objective the question deals with from Objective 8.c to Objective 3
Comments:	None
Tier/Group:	T2G1

42. Which ONE of the following completes the statement below?

With Containment Spray actuated, the Containment Spray Chemical Addition Valves (1CT-11 and 1CT-12) will close upon receipt of a Containment Spray Additive Tank empty level when the level reaches . . .

A. 23.4%

B. 10%

C. 2%

D. 0%

Plausibility and Answer Analysis

Reason answer is correct: The Containment Spray Chemical Addition valve automatically shut when the tank level lowers to 2% as indicated on LI-7150 or LI-7166

A. Incorrect. Plausible because the containment spray pumps realign from the RWST to the Containment Recirculation Sump when RWST level is 23.4% on 2 of 4 RWST level channels

B. Incorrect. Plausible because the containment spray systems actuates at 10 psig and the candidate may associate that value with tank empty alarm setpoint.

C. Correct.

D. Incorrect. Plausible because 0 psig is the setpoint for the Spray Additive Tank Nitrogen Low pressure alarm and the candidate may associate that value with tank empty alarm setpoint.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

026 Containment Spray System (CSS)

026 A1.05 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CSS controls including: Chemical additive tank level and concentration

Containment humidity
(CFR: 41.5 / 45.5)

Importance Rating:	3.1 3.3
Technical Reference:	APP-ALB-001, rev 21, pg 13
References to be provided:	None
Learning Objective:	CT Student Text obj 6.c
Question Origin:	Bank
Comments:	The Containment Spray system at HNP is operated independent of the humidity level of Containment. Unable to write a question for the original K/A 026 A1.04 due to the lack procedural actions or an RO task for the original K/A. Replace with randomly selected K/A 026 A1.05 by Bruno Caballero 6/13/2013
Tier/Group:	T2G1

43. Given the following plant conditions
    - The plant was operating at 100% power
    - A LOCA has occurred and the crew is implementing E-1, Loss Of Reactor Or Secondary Coolant
    - CT Pump 'A' trips on overcurrent

    Which ONE of the following completes the statements below?

    The recirc sump suction valve(s) __(1)__ will automatically open when RWST level reaches the Lo-Lo Level AND once in the full open position __(2)__ .

    1CT-26, RWST To CNMT Spray Pump A-SA
    1CT-105, Containment Sump To CNMT Spray Pump A-SA

    1CT-71, RWST To CNMT Spray Pump B-SB
    1CT-102, Containment Sump To CNMT Spray Pump B-SB

    A. (1) 1CT-102

       (2) 1CT-71 must be manually shut

    B. (1) 1CT-102 AND 1CT-105

       (2) 1CT-26 AND 1CT-71 must be manually shut

    C. (1) 1CT-102

       (2) 1CT-71 will automatically shut

    D. (1) 1CT-102 AND 1CT-105

       (2) 1CT-26 AND 1CT-71 will automatically shut

Reason answer is correct: Containment Spray (CT) pumps automatically realign from the RWST to the containment recirculation sump when the RWST Lo-Lo level of 23.4% is reach on 2/4 channel provided the associated CT pump breaker is shut indicating that the pump is running. Once the associated containment sump valve is open a 5 second time delay is present between the opening of the recirculation line valves and the closing of the RWST valves to allow sufficient time for the recirculation line to fill.

A. *Incorrect. The first part is correct. The second part is plausible because the RWST suction for the RHR pumps 1SI-322 and 1SI-323 must be manually realigned to complete the cold leg recirculation line for the RHR system.*

B. *Incorrect. The first part is plausible because when the RWST level reaches the Lo-Lo level a signal is generated to open the containment sump suction valves for the both RHR pumps regardless of the RHR pump breaker status. The second part is plausible because the RWST suction valves for the RHR pumps, 1SI-322 and 1SI-323 must be manually realigned to complete the cold leg recirculation line for the RHR system.*

C. *Correct.*

D. *Incorrect. The first part is plausible because when the RWST level reaches the Lo-Lo level a signal is generated to open the containment sump suction valves for the both RHR pumps regardless of the RHR pump breaker status. The second part is plausible because it is the correct operation of CT system if both pumps are running.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

026 Containment Spray System (CSS)

026 K3.02 Knowledge of the effect that a loss or malfunction of the CSS will have on the following: Recirculation spray system
(CFR: 41.7 / 45.6)

Importance Rating:	4.2 4.3
Technical Reference:	APP-ALB-004, pg 9, Rev 17 CT Student Text, pg 17, Rev 10 SI Student Text, pg 24, Rev 9
References to be provided:	None
Learning Objective:	CT Student Text, obj 6.d
Question Origin:	New
Comments:	None
Tier/Group:	T2G1

44. Given the following plant conditions:
    - A LOCA has occurred
    - ALL Off-Site power was lost
    - RCS pressure is 1100 psig and stable
    - Containment pressure is 5 psig and stable
    - The crew is performing actions contained in ES-1.2, Post LOCA Cooldown and Depressurization

    Which ONE of the following describes the method that will be used to perform cooldown of the RCS?

    Perform cooldown using...

    A. Condenser steam dumps at maximum achievable rate until RHR can be placed in service. Place steam dumps in Bypass Interlock when the P-12 status light is lit. RCS cooldown rate limits do NOT apply for this condition.

    B. Condenser steam dumps at less than 100°F per hour until RHR can be placed in service. Place steam dumps in Bypass Interlock when the P-12 status light is lit.

    C. S/G PORVs at the maximum achievable rate until RHR can be placed in service. RCS system cooldown rate limits do NOT apply for this condition.

    D. S/G PORVs at less than 100°F per hour until RHR can be placed in service.

Plausibility and Answer Analysis

Reason answer is correct: *Condenser steam dumps are not available because no circulating water pumps are available due to the loop additionally Containment pressure rose above 3 psig and a MSLI actuated to shut all MSIVs. Therefore SG PORVs are required to be used if the condenser is not available. Rate is correct per ES-1.2 step 10.a - Maintain cooldown rate in RCS cold legs to < 100°F/HR.*

A. Incorrect. *Plausible since Condenser steam dumps would be used for cooldown if the condenser was available. The cooldown rate is plausible because other EOPs perform a max rate cooldown but ES-1.2 limits cooldown to 100°F/hour*

B. Incorrect. *Plausible since Condenser steam dumps would be used for cooldown if the condenser was available. Cooldown rate is correct, ES-1.2 limits cooldown to 100°F/hour..*

C. Incorrect. *Plausible because the Condenser steam dumps are not available and the SG PORVs are the alternate method of depressurizing the secondary. The cooldown rate is plausible because other EOPs perform a max rate cooldown but ES-1.2 limits cooldown to 100°F/hou*

D. *Correct.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

039 Main and Reheat Steam System (MRSS)

039 A2.01 Ability to (a) predict the impacts of the following malfunctions or operations on the MRSS; and (b) based on predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Flow paths of steam during a LOCA
(CFR: 41.5 / 43.5 / 45.3 / 45.13)

Importance Rating:	3.1 3.2
Technical Reference:	ES-1.2, rev 0, pg 12
References to be provided:	None
Learning Objective:	Lesson plan EOP-LP-3.5, rev 12, obj 5.c
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G1

45. Given the following plant conditions:
    - The plant is operating at 85% power
    - A Loss of Main Feedwater Pump 'B' occurs
    - The crew enters AOP-010, Feedwater Malfunctions

    Which ONE of the following describes (1) the plant response AND (2) the action required in accordance with AOP-010?

    A. (1) Automatic turbine runback is initiated

       (2) Isolate Steam Generator Blowdown

    B. (1) Automatic turbine runback is initiated

       (2) Trip the Reactor and go to E-0

    C. (1) Automatic turbine runback is NOT initiated

       (2) Isolate Steam Generator Blowdown

    D. (1) Automatic turbine runback is NOT initiated

       (2) Trip the Reactor and go to E-0

Reason answer is correct: Trip of the MFP 'B' causes the Turbine to runback to < 60% to reduce steam flow to within the feed flow capacity of one MFP. AOP-010 direct the operator to shut the blowdown FCV to reduce the inventory loss until the runback is complete

A. Correct.

B. Incorrect. Plausible because a turbine runback will occur automatically and the power level is just below the value that would require the candidate to trip the reactor and go to E-0, IAW AOP-010.

C. Incorrect. Plausible because the AOP-010 action for this power level is to shut the blowdown FCV, and if both Heater Drain pump where to trip then no runback would occur because 85% is below the power level (90%) for which a turbine runback would be caused by a trip of the last running HDP.

D. Incorrect. Plausible because a turbine runback would not occur if both Heater Drain pump were to trip because 85% is below the power level (90%) in which that runback is active and if the above 90% initial power actions were taken for being initially above 80% then the candidate would trip the reactor and go to E-0.

Given the following plant conditions:
- The plant is operating at 85% power
- A Loss of Main Feedwater Pump 'B' occurs
- The crew enters AOP-010, Feedwater Malfunctions

Which ONE of the following describes (1) the plant response AND (2) the action required in accordance with AOP-010?

A. (1) Automatic turbine runback is initiated

(2) Isolate Steam Generator Blowdown

B. (1) Automatic turbine runback is initiated

(2) Trip the Reactor and go to PATH-1

C. (1) Automatic turbine runback is NOT initiated

(2) Isolate Steam Generator Blowdown

D. (1) Automatic turbine runback is NOT initiated

(2) Trip the Reactor and go to PATH-1

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

059 Main Feedwater (MFW) System

059 K4.02 Knowledge of MFW design feature(s) and/or interlock(s) which provide for the following: Automatic turbine/reactor trip runback
(CFR: 41.7)

Importance Rating:	3.3 3.5
Technical Reference:	AOP-010, Section 3.0, Step 3, Page 4, Rev 36
References to be provided:	None
Learning Objective:	Digital Electrohydraulic Control System Obj. 8.a
Question Origin:	Bank
Comments:	2012 NRC exam
Tier/Group:	T2G1

46. Given the following plant conditions:
    - The crew is implementing ECA-0.0, Loss of All AC Power
    - The TDAFW has been running in automatic control for several minutes
    - All SG NR levels are approximately 9% and lowering
    - AFW flow is currently 160 kpph

    Which ONE of the following identifies the action(s) required to be taken for this condition?

    A. Transition to FR-H.1, Response to Loss of Secondary Heat Sink.

    B. Open all 3 SG PORVs to depressurize the SGs until AFW flow is > 210 kpph.

    C. Place Aux FW Turbine SPD PDK-2180.1 in MAN and raise the OUTPUT to raise both feedwater flow and SG level.

    D. Monitor TDAFW pump performance in automatic since the current setpoint will be adequate to maintain SG levels and flow.

Plausibility and Answer Analysis

Reason answer is correct: *ECA-0.0 step 4 RNO directions for AFW flow < 210 kpph are to verify the TDAFW pump is running and adjust TDAFW pump speed controller as necessary to raise flow.*

A. *Incorrect. Plausible since NR level in all SGs are < 25% and total AFW flow is < 210 kpph which is a RED path condition requiring entry into FR-H.1 but a note prior to step 1 of ECA-0.0 states: CRF Status Trees should be monitored for information only. FR procedures should NOT be implemented unless directed by this procedure. In this case an operator can adjust the TDAFW speed control to raise flow to > 210 kpph and there is NO direction in ECA-0.0 to transistion to FR-H.1.*

B. *Incorrect. Plausible since depressurizing the SGs will cause more AFW flow. This would be effective IF the MDAFW pumps were running but since the TDAFW pump speed controller maintains a 31 psid (this setpoint is variable and is determined by a value provided in Curve Book Curve F-X-10). Decreasing SG pressures will only have a temporay effect on flow rate until the TDAFW controller adjusts speed to regain the 31 psid. The procedure directions for this condition are to increase the speed controller setting to obtain more flow not to depressurize the SGs.*

C. *Correct.*

D. *Incorrect. Plausible since the TDAFW flow control is set to maintain approximately 31 psid. This setting is not normally changed during AFW feeding with the TDAFW pump. The setpoint of 31 psid is used to prevent SG overfill during a SG Tube Rupture event. Since the event in progress is a loss of All AC power and NOT a SG Tube rupture, the TDAFW pump is the ONLY source of feedwater available. Directions are provided in ECA-0.0 to increase TDAFW pump speed when flow is < 210 kpph to obtain adequate flow rates to overcome possible high SG pressures to raise SG level and control SG levels between 25% to 50%.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

061 Auxiliary / Emergency Feedwater (AFW) System

061 A1.01 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the AFW controls including: S/G level
(CFR: 41.5 / 45.5)

Importance Rating:	3.9 4.2
Technical Reference:	ECA-0.0, rev 2, pg 5, step 4
References to be provided:	None
Learning Objective:	Lesson plan EOP-LP-3.7, rev 10, obj 6
Question Origin:	New
Comments:	None
Tier/Group:	T2G1

47. Given the following plant conditions:
    - The plant is operating at 100% power
    - Annunciator ALB-014-7-4, SG A, B, C Backleakage High Temp, has alarmed and has been verified as valid by local pyrometer readings indicating > 212°F

    Under these conditions why would establishing AFW flow to the Steam Generators be an undesirable action?

    Rapid introduction of Auxiliary feed flow could result in. . .

    A. AFW Pump run out conditions.

    B. thermal binding of AFW system valves.

    C. accelerated water induced corrosion of AFW piping.

    D. water hammer in AFW piping.

Reason answer is correct: Per the AOP-010 basis document if steam has entered the horizontal portions of the AFW system piping the introduction of cold AFW water could create bubble collapse water hammer of a damaging magnitude.

A. *Incorrect. Plausible because the collapsing of steam bubbles will result in a surge in the pump flow, but the discharge pressure control valve is designed to prevent the pump from reaching runout conditions*

B. *Incorrect. Plausible because the backleakage from the steam generators will result in higher temperatures, but the AFW system has alarms to alert the operator before the system becomes susceptible thermal binding of the systems valves.*

C. *Incorrect. Plausible because flow accelerated corrosion (FAC) is possible on carbon steel piping (AFW uses stainless steel piping). According to EGR-NGGC-0202, Flow Accelerated Corrosion Monitoring Program, "Flow accelerated corrosion is wall thinning caused by the dissolution of magnetite in single and two phase flow." FAC is a long term problem, which would not be initiate by a short term intorducion of flow to a voided section of piping.*

D. *Correct.*

Given the following plant conditions:
- The plant is operating at 100% power
- Annunciator ALB-014-7-4, SG A, B, C Backleakage High Temp, has alarmed and has been verified as valid by local pyrometer readings indicating > 212°F

Under these conditions why would establishing AFW flow to the Steam Generators be an undesirable action?

Rapid introduction of Auxiliary feed flow could result in. . .

A. AFW Pump run out conditions.

B. thermal binding of AFW system valves.

C. accelerated water induced corrosion of AFW piping.

D. water hammer in AFW piping.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

061 Auxiliary / Emergency Feedwater (AFW) System

061 K5.05 Knowledge of the operational implications of the following concepts as the apply to the AFW: Feed line voiding and water hammer
(CFR: 41.5 / 45.7)

Importance Rating:	2.7 3.2
Technical Reference:	AOP-010 BD, rev 18, pg 7, 1.0 Discussion on SG Backleakage, pg 39, Attachment 9, Step 1.b
References to be provided:	None
Learning Objective:	AOP-010, Feedwater System Malfunctions, AOP3-10 Obj. 2.a.2
Question Origin:	2012 NRC RO
Comments:	None
Tier/Group:	T2G1

48. Given the following plant conditions:
    - The unit is operating at 100% power
    - Aux Bus 1E deenergizes and is locked out

    Which ONE of the following describes an effect on the unit?

    A. RCP 'C' is deenergized

    B. CSIP 'A' is momentarily deenergized

    C. CSIP 'B' is momentarily deenergized

    D. CTMU Pump '1X' is deenergized

    Plausibility and Answer Analysis

    Reason answer is correct: *Bus 1E is the normal supply to 6.9 KV Bus 1B-SB. The 'B' CSIP is momentarily de-energized until the EDG comes up to speed and voltage then powers the Emergency bus 1B-SB. The Charging pump will be loaded onto the Emergency bus by the sequencer.*

    A. Incorrect. Plausible because because Bus 1A and 1B supply RCPs.

    B. Incorrect. Plausible because because losing Bus 1A-SA will result in this effect

    C. Correct.

    D. Incorrect. Plausible because it is powered from Bus 1D

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

062 AC Electrical Distribution System

062 K2.01 Knowledge of bus power supplies to the following: Major system loads (CFR: 41.7)

Importance Rating:	3.3 3.4
Technical Reference:	OP-107, rev 100, pg 87
References to be provided:	None
Learning Objective:	CVCS Student Text, obj 2
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G1

49. Given the following plant conditions:
    - The plant is operating at 100% power
    - Train "A" 125VDC Battery Chargers are being swapped to 1B-SA in service in accordance with OP-156.01, DC ELECTRICAL DISTRIBUTION
    - 1A DC Bus Voltage is 133 VDC
    - After 1B-SA DC breaker is closed, 1B-SA Voltmeter lowers slowly to 112 VDC and stabilizes

    Which ONE of the following actions are required?

    A. Run 1A-SA and 1B-SA in parallel until the voltages equalize.

    B. Open the 1B-SA DC Breaker, shutdown the charger, and contact electrical maintenance.

    C. Close the 1B-SA AC Input Breaker and verify that 1B-SA voltage rises to the normal band.

    D. Remove 1A-SA Battery Charger from service and verify that 1B-SA voltage rises to the normal band.

    Plausibility and Answer Analysis

    Reason answer is correct: *OP-156.01 repetitive procedure note regarding a symptom of a charger internal fault which reads: Steadily decreasing voltage is indicative of an internal fault in the battery charger being placed in service. If this is observed, the battery charger should NOT be placed on line until the cause is found and corrected.*

    A. Incorrect. Plausible because there is a procedure for running the chargers in parallel when load is high.

    B. Correct.

    C. Incorrect. Plausible because the AC breaker has not been closed until after the DC breaker is closed to charge the rectifiers from the battery.

    D. Incorrect. Plausible if candidate believes 1A-SA is still carrying the DC load.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

063 D.C. Electrical Distribution

063 A3.01 Ability to monitor automatic operation of the DC electrical system, including: Meters, annunciators, dials, recorders, and indicating lights
(CFR: 41.7 / 45.5)

Importance Rating:	2.7 3.1
Technical Reference:	OP-156.01, rev 34, pg 37, Note (multiple places in procedure)
References to be provided:	None
Learning Objective:	DCP Objective 9
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G1

50. Given the following plant conditions:
    - The plant is currently in MODE 3
    - 'A' and 'B' MDAFW Pumps are operating and feeding all 3 SGs
    - 125 VDC control power to the 'A' MDAFW Pumps is lost

    Which ONE of the following completes the statement below for the 'A' MDAFW Pump?

    Breaker control from the MCB is ___(1)___ AND the control switch indication on the MCB will ___(2)___ .

    A. (1) available

       (2) extinguish

    B. (1) not available

       (2) extinguish

    C. (1) available

       (2) remain illuminated

    D. (1) not available

       (2) remain illuminated

Reason answer is correct: 125 VDC provides control power for 6.9 KV breakers and remote indication of breaker status on the MCB. With the loss of control power the indication on the MCB is extinguished, and the breaker cannot be operated remotely without control power from the MCB.

A. *Incorrect. The first part is plausible because smaller 480 volt MCC breakers provide control power by tapping 2 phases of the 3 main line phases. The second part is correct.*

B. *Correct.*

C. *Incorrect. The first part is plausible because smaller 480 volt MCC breakers supply control power by tapping 2 phases of the 3 main line phases. The second part is plausible because the breaker smaller 480 volt MCC breakers local indications are powered which is powered by 2 phases of the 3 main line phases.*

D. *Incorrect. The first part is correct. The second part is plausible the breaker is powered by AC which remains available and smaller 480 volt MCC breaker indications are provided through the control power which is supplied by 2 phases of the 3 main line phases.*

Given the following plant conditions:
- The plant is in Mode 3
- MDAFW Pumps 'A' and 'B' are in service feeding all 3 SGs
- EDG 'B' is under clearance for maintenance

Subsequently:
- All power from 125 VDC Emergency Bus DP-1B-SB is lost
- One minute later a Startup Transformer 1B lockout occurs

Which ONE of the following completes the statement below?

MDAFW Pump 'B' breaker indication on the MCB is __(1)__ AND the pump motor breaker is __(2)__ ?

A. (1) available
   (2) closed

B. (1) not available
   (2) closed

C. (1) available
   (2) open

D. (1) not available
   (2) open

063 D.C. Electrical Distribution

063 K3.02 Knowledge of the effect that a loss or malfunction of the DC electrical system will have on the following: Components using DC control power (CFR: 41.7 / 45.6)

Importance Rating:	3.5 3.7
Technical Reference:	Drawing 2166-B-401-1921, rev 11
References to be provided:	None
Learning Objective:	DC Power Obj. 9
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G1

51. The Main Control Room receives the following reports from the field:
    - Specific gravity of the fuel oil in both Fuel Oil Day Tanks is .835
    - EDG Fuel Oil Day Tank 'A' indicated level is 47%
    - EDG Fuel Oil Storage Tank 'A' indicates 90,000 gallons
    - EDG Fuel Oil Day Tank 'B' indicated level is 42%
    - EDG Fuel Oil Storage Tank 'B' indicates 110,000 gallons

    Which ONE of the following is the current OPERABILITY status of the Emergency Diesel Generators?

    (Reference provided)

	EDG 'A'	EDG 'B'
A.	OPERABLE	OPERABLE
B.	OPERABLE	INOPERABLE
C.	INOPERABLE	OPERABLE
D.	INOPERABLE	INOPERABLE

Reason answer is correct: *Tech Spec 3.8.1.1*

b.1. A separate day tank containing a minimum of 1457 gallons of fuel, (IAW Curve D-X-20, the minimum MCB level indication for a specific gravity of .835 is ~41.6%)

b.2. A separate main fuel oil storage tank containing a minimum of 100,000 gallons of fuel

A. Incorrect *The 'A' EDG is not operable, the requirement for DFOST level is >100,000 gallons. 'B' EDG is operable. Though the 'B' EDG Fuel Oil Day Tank level is less than the alarm setpoint (45.4%), it is still above the Tech Spec Limit of Curve D-X-20.*

B. Incorrect *The 'A' EDG is not operable, the requirement for DFOST level is >100,000 gallons. The 'B' EDG is operable. Though the 'B' EDG Fuel Oil Day Tank level is less than the alarm setpoint (45.4%), it is still above the Tech Spec Limit of Curve D-X-20.*

C. Correct *The 'A' EDG is inoperable due to low DFOST level <100,000 gallons. The 'B' EDG is operable. Though the 'B' EDG Fuel Oil Day Tank level is less than the alarm setpoint (45.4%), it is still above the Tech Spec Limit of Curve D-X-20.*

D. Incorrect *The 'A' EDG is inoperable due to low DFOST level <100,000 gallons. The 'B' EDG is operable. Though the 'B' EDG Fuel Oil Day Tank is only below the alarm setpoint (45.4%), it is still above the Tech Spec Limit of Curve D-X-20.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

064 Emergency Diesel Generators (ED/G)

064 K6.08 Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: Fuel oil storage tanks
(CFR: 41.7 / 45.7)

Importance Rating:	3.2 3.3
Technical Reference:	Curve D-X-20 Rev 1 (provided to students) T.S. 3.8.1.1 page 3/4 8-1 ALB-025 Rev. 15, Window 4-3
References to be provided:	Curve D-X-20 Rev. 1
Learning Objective:	DE Objective 13.a
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G1

52. Which ONE of the following radiation monitors going into high alarm would require entry into AOP-032, High RCS Activity?

A. RM-1RR-3601, Letdown HX Valve Gallery

B. RM-1CR-3587, Reactor Coolant Drain Tank

C. RM-1CR-3561C-SA, Containment Ventilation Isolation

D. RM-21AV-3509-1SA, Plant vent stack radiation monitor

Plausibility and Answer Analysis

Reason answer is correct: *Entry into AOP-032 is based on 2 conditions: the first is notification from Chemistry of an abnormal ris in RCS Dose Equivalent Iodine I-131 activity or gross activity and the second entry is higher than normal raidation levels on ANY of the Fuel Breach Area Monitors. The Letdown Hx Vlv Gal radiation monitor RR-1RR-3601 is one of the monitors that is found in Table 1 under AOP-032 entry condition radiation monitors.*

A. Correct.

B. Incorrect. Plausible since RCS activity entering the Main Steam system via a tube leak or rupture would cause the Main Steam Line radiation monitor to alarm.

C. Incorrect. Plausible since RCS activity entering the Blow Down system via normal at power conditions would cause the Blow Down radiation monitor to alarm.

D. Incorrect. Plausible since RCS activity via a Steam Generator tube leak would be detected by Plant vent stack radiation monitor going into alarm.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

073 Process Radiation Monitoring (PRM) System

073 A4.02 Ability to manually operate and/or monitor in the control room: Radiation monitoring system control panel
(CFR: 41.7 / 45.5 to 45.8)

Importance Rating:	3.7 3.7
Technical Reference:	AOP-032, Entry conditions, page 3, Rev. 19
References to be provided:	None
Learning Objective:	AOP-032 Objective 1
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G1

53. Given the following plant conditions:
    - The plant was in Mode 4 when a Loss of Off-site power occurred
    - The 'A' EDG failed to start
    - The 'B' NSW pump is tagged out for maintenance

    Which ONE of the following completes the statement below?

    ESW is providing flow to CCW Heat Exchanger(s) __(1)__ with ESW return header flow aligned to the __(2)__.

    A. (1) 'B' ONLY

       (2) Auxiliary Reservoir

    B. (1) 'B' ONLY

       (2) Cooling Tower Basin

    C. (1) 'A' AND 'B'

       (2) Auxiliary Reservoir

    D. (1) 'A' AND 'B'

       (2) Cooling Tower Basin

Reason answer is correct: *When ESW pump 1B starts, 1SW-40 closes automatically to isolate the A ESW header supplying CCW cooler 'A' to ensure flow is provided to the 'B' header only, which supplies the 'B' CCW heat exchanger. 1SW-271 opens to align return header flow to the aux reservoir, and 1SW-274 closes to isolate header return to the cooling tower basin which is the normal return header flow path.*

A. *Correct.*

B. *Incorrect. The first part is correct (see A above). The second part is incorrect since 1SW-271 opens to align return header flow to the aux reservoir, and 1SW-274 closes to isolate header return to the cooling tower basin*

C. *Incorrect. The first part is incorrect but plausible. The ESW headers are initially cross connected. Under these conditions, 1SW-40 closes automatically to isolate the A ESW header supplying CCW cooler 'A'. The second part is correct (see A above).*

D. *Incorrect. The ESW headers are initially cross connected. Under these conditions, 1SW-40 closes automatically to isolate the A ESW header supplying CCW cooler 'A'. The second part is incorrect but plausible since 1SW-271 opens to align return header flow to the aux reservoir, and 1SW-274 closes to isolate header return to the cooling tower basin.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

076 Service Water System (SWS)

076 K1.01 Knowledge of the physical connections and/or cause- effect relationships between the SWS and the following systems: CCW system
(CFR: 41.2 to 41.9 / 45.7 to 45.8)

Importance Rating:	3.4 3.3
Technical Reference:	AOP-022, section 3.0 step 5, Rev. 35
References to be provided:	None
Learning Objective:	SWS Obj 5
Question Origin:	Bank
Comments:	KA is met by evaluating the cause-effect relationship when NSW is lost due to the loss of off site power with the subsequent restart of the 'B' ESW pump, resulting in isolation of the 'A' CCW cooling supply.
Tier/Group:	T2G1

54. Given the following plant conditions:
    - The unit is operating at 100% power
    - A loss of Instrument Air is occurring
    - Instrument air pressure is currently 85 psig and slowly lowering

    Which ONE of the following describes the current condition of the plant for this event?

    A. SG levels will be rapidly lowering due to the closing of all FW flow control valves (1FW-133, 1FW-191, and 1FW-249).

    B. Containment instrument air system pressure will cause RCS letdown flowpath valves to begin to fail to mid-position.

    C. All valves that have instrument air supplied for operation or control are now considered to be unreliable.

    D. PZR PORVs will not OPEN in either automatic or manual operation.

    Plausibility and Answer Analysis

    Reason answer is correct: *In accordance with AOP-017, Loss of Instrument Air, Attachment 7, when IA pressure decreases to 85 psig the RCS letdown flowpath valves (located in Containment) begin to fail to mid-position.*

    A. Incorrect. Plausible since the FW flow control valves auto shut with low IA pressure but the pressure at which they close has not been reached yet. AOP-017 Attachment 7 states that the valves will auto shut when IA pressure is 60 psig.

    B. Correct.

    C. Incorrect. Plausible since AOP-017, Attachment 7 states that all remaining air-operated valves will no longer be considered reliable. But this IA pressure has not be reached yet. Attachment 7 indicates that the IA pressure for this to occur is at 35 psig.

    D. Incorrect. Plausible since the PRZ PORVs have an instrument air supply to their accumulators. But the accumulators are also supplied by Nitrogen with the Nitrogren regulator set at a higher value than the IA supply pressure therefore the PORVs would still funtion in both automatic and manual as long as the Nitrogen supply pressure is maintained.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

078 Instrument Air System (IAS)

078 K3.01 Knowledge of the effect that a loss or malfunction of the IAS will have on the following: Containment air system
(CFR: 41.7 / 45.6)

Importance Rating:	3.1 3.4
Technical Reference:	AOP-017, Attachment 7, page 57, Rev. 35
References to be provided:	None
Learning Objective:	AOP-LP-3.17, Objective 2 & 4, rev. 4
Question Origin:	New
Comments:	None
Tier/Group:	T2G1

55. Given the following plant conditions:
    - The plant is Mode 5
    - No RCPs are in service
    - The RCS temperature is 149°F

    Which ONE of the following describes the component that is required to be placed in service AND why?

    A. Reactor Support Cooling Fan, S-4A-SA, to provide cooling to the Nuclear Instruments to maintain them within their design limits

    B. Containment Fan Cooler, AH-2A-SA, to provide cooling to the RCPs during normal and abnormal operation

    C. Primary Shield Cooling Fan, S-2A-SA, to provide cooling to minimize dehydration and subsequent structural damage

    D. Containment Fan Coil Unit, AH-37A, to provide cooling to CNMT during normal and abnormal operation

Reason answer is correct: GP-002, P&L 33 requires the S-2 and S-4 fans to be placed in service if RCS hot or cold leg temperature is greater than or equal to 140°F. Primary Shield Cooling is to supply cool air from the to minimize dehydration and subsequent structural damage.

A. Incorrect. *Plausible since the P&L requires the fans to be placed in service for these conditions and the fans are located in the Containment but they are designed to supply cooling air to the Reactor Vessel supports and to the Reactor Coolant leg nozzles to reduce thermal expansion not force air between the Reactor Vessel and the concrete wall. Cooling to NIS comes from S-2 fans.*

B. Incorrect. *Plausible if the candidate does not understand what the system is designed to do. The P&L requires the S-2 fans to be place in service not the AH-2 fans is RCS loop temperature is greater than 140°F. Both fans are located in the Containment, but the AH-2 fans are designed to provide cooling support but to the CNMT not the RCPs.*

C. *Correct.*

D. Incorrect. *Plausible if the candidate does not understand what the system is designed to do. The Containment Fan Coil Units are located in the Containment and are designed to provide cooling to RCPs for normal operation and accident conditions.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

103 Containment System

103 K1.03 Knowledge of the physical connections and/or cause effect relationships between the containment system and the following systems: Shield building vent system
(CFR: 41.2 to 41.9 / 45.7 to 45.8)

Importance Rating:	3.1 3.5
Technical Reference:	OP-169, P&L 3, Pg 4, Rev 22 CCS Student Text, Pg 3, Rev 4
References to be provided:	None
Learning Objective:	Containment Cooling System Student Text Obj. 4.d
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G1

56. Given the following plant conditions:
    - A Loss of Off-site Power occurs while the unit was operating at 100% power
    - EDG A-SA failed to start
    - Diesel loading sequence is complete
    - RCS pressure is 2180 psig

Assuming NO operator action has been taken, which ONE of the following identifies the PZR Heaters group(s) that are currently energized, if any?

A. None

B. B only

C. C only

D. B and C only

Plausibility and Answer Analysis

Reason answer is correct: After a LOOP, manual action is required to reenergize 1B1 to provide power for backup heater Group B. C heaters can not be restored until after the non-vital bus is restored.

A. Correct.

B. Incorrect. Plausible to believe B heaters will be sequenced on during Diesel loading of 1B-SB bus.

C. Incorrect. Plausible to believe C heaters will be sequenced during Diesel loading since C heaters are normally always energized, powered from 1D2.

D. Incorrect. Plausible to believe B and C heaters will be sequenced during Diesel loading.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

011 Pressurizer Level Control System (PZR LCS)

011 K2.02 Knowledge of bus power supplies to the following: PZR heaters (CFR: 41.7)

Importance Rating:	3.1 3.2
Technical Reference:	Pressurizer Pressure Control Student Text, Chapter 2 pages 8 - 10 Chapter 3, pages 16-18
References to be provided:	
Learning Objective:	Pressurizer Pressure Control Student Text, Objective 8 Pg. V
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G2

57. Given the following plant conditions:
    - The unit is operating at 8% power
    - Intermediate Range (IR) N35 is inoperable
    - N35 Level Trip Switch is in BYPASS in accordance with OWP-RP-21, Reactor Protection

    The following occur:
    - The power supply for N35 is operating erratically
    - N35 Instrument Power fuses blow
    - Two minutes later N35 Control Power fuses blow

    Which ONE of the following identifies the expected status of the Reactor Trip Breakers as a result of these conditions?

    A. OPEN when N35 Instrument Power fuses blew

    B. OPEN when N35 Control Power fuses blew

    C. CLOSED because N35 is BLOCKED in SSPS

    D. CLOSED because N35 is in BYPASS

    Plausibility and Answer Analysis

    Reason answer is correct: *When the Control Power fuses blew this actuated the 1/2 IR trip and resulted in the RTBs opening. (This function is de-energize to actuate and control power supplies the bistables)*

    A. Incorrect. Plausible because it would be the correct answer if the Level Trip Switch was in NORMAL.

    B. Correct.

    C. Incorrect. Plausible because it would be the correct answer if the plant were operating greater than 10% power with the IR trips blocked. (NOTE that the status of blocks is not provided. The student must use knowledge of plant operation to determine.)

    D. Incorrect. Plausible because it would be the correct answer if the Control Power fuses never blew.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

015 Nuclear Instrumentation System (NIS)

015 K3.01 Knowledge of the effect that a loss or malfunction of the NIS will have on the following: RPS
(CFR: 41.7 / 45.6)

Importance Rating:	3.9 4.3
Technical Reference:	OWP-RP-21 pp 84 Rev 16
References to be provided:	None
Learning Objective:	Nuclear Instrumentation Student Text Obj 8.a
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G2

58. Given the following plant conditions:
    - The unit is operating at 100% power
    - ALB-015-1-5, 7.5 KVA UPS Trouble, alarms

    Which ONE of the following identifies (1) the uninterruptible power supply that is affected for this alarm AND (2) the action taken, if required, for the loss of this power supply, per AOP-024, Loss Of Uninterruptible Power Supply?

    A. (1) UPP-1B

       (2) Locally control Steam Dumps

    B. (1) UPP-1B

       (2) Locally control Condensate Booster pumps

    C. (1) UPP-1

       (2) Locally control Steam Dumps

    D. (1) UPP-1

       (2) Locally control Condensate Booster pumps

Reason answer is correct: ALB-015 window 1-5 directs the operator to investigate the 120V (NNS) Bus UPP-1B. AOP-024 directs the operator to locally control Condensate Booster pumps to maintain a constant suction pressure to the Main Feedwater pumps as designed.

A. Incorrect. The first part is correct. The second part is plausible because the Steam dump system is the normal steam relief path during startup and the loss of UPP-1 the 60KVA inverter would require the operator to MANUALLY control the steam dumps while the SG PORVs require local operation when the instrument bus power supply is lost for S-i, S-II or S-III.

B. Correct.

C. Incorrect. The first part is plausible because the UPP-1 is part of the 120V (NNS) UPS system but the power supply for this bus is the 60KVA inverter. The second part is plausible because the Steam dump system is the normal steam relief path during startup and the loss of UPP-1 the 60KVA inverter would require the operator to MANUALLY control the steam dumps while the SG PORVs require local operation when the instrument bus power supply is lost for S-i, S-II or S-III.

D. Incorrect. The first part is plausible because the UPP-1 is part of the 120V (NNS) UPS system but the power supply for this bus is the 60KVA inverter. The second part is correct.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

016 Non-Nuclear Instrumentation System (NNIS)

016 A2.02 Ability to (a) predict the impacts of the following malfunctions or operations on the NNIS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of power supply
(CFR: 41.5 / 43.5 / 45.3 / 45.5)

Importance Rating:	2.9 3.2
Technical Reference:	APP-ALB-015 Window 1-5 AOP-024, rev 52, pg 22 and 56
References to be provided:	None
Learning Objective:	Lesson Plan LP-AOP-3.24, Obj 6
Question Origin:	New
Comments:	None
Tier/Group:	T2G2

59. Given the following plant conditions:
    - The unit was operating at 100% power
    - A LOCA has occurred
    - The crew is implementing E-1, Loss of Reactor or Secondary Coolant
    - Containment hydrogen concentration is currently 0.6% and rising
    - The RAB AO is aligning the 'A' Hydrogen Recombiner for operation
    - A fault occurred on 480 V MCC 1A21 SA and power has been lost to the 'A' Hydrogen Recombiner control panel and cannot be restored
    - The RAB AO has now been directed to align the 'B' Hydrogen Recombiner for operation

    Which ONE of the following completes the statement below?

    Containment hydrogen concentration will...

    A. be maintained < 4% with Containment Hydrogen Purge secured.

    B. be maintained < 4% with Containment Hydrogen Purge in service.

    C. rise to > 4% with Containment Hydrogen Purge secured and will require securing the 'B' Hydrogen Recombiner.

    D. rise to > 4% but the Containment atmosphere will NOT reach the lower explosive mixture limit due to the high moisture content in the air.

Reason answer is correct: There are two 100% capacity Hydrogen Recombiners. The FSAR design basis of the recombiners state that each recombiner is capable of maintaining Containment hydrogen concentrations below 4% volume. The recombiners are capable of performing this function with the Containment Hydrogen purge system secured. The Containment Hydrogen Purge system is provided as a backup means of controlling hydrogen inside the Containment Building.

A. Correct.

B. Incorrect. Plausible since only one Hydrogen Recombiner is required to operate to maintain Containment hydrogen concentration < 4% but the Containment Hydrogen Purge system is not required to operate except as a backup in the event of a failure of both Hydrogen Recombiners. Additionally, the Containment Hydrogen Purge system will not be placed in service until the Containment transient pressure has dropped to atmospheric pressure.

C. Incorrect. Plausible since one Hydrogen Recombiner has been lost from service but only one Recombiner is required to be operational to maintain Containment hydrogen concentration < 4%. Additionally, if Containment hydrogen concentrations were to rise above 4% OP-125, P&L #1 states that the Containment H2 Recombiners should not be operated.

D. Incorrect. Plausible since Containment hydrogen concentration could reach > 4% but with one Recombiner in service the concentration should remain below 4%. Additionally, the moisture content in the Containment atmosphere may cause the mixture to remain below the lower explosive limit. Inerting the Containment atmosphere is one of the stratagies used in the SAMG procedures to prevent an explosive mixture. The lower explosive hydrogen mixture limit of 4% is based on "dry" air conditions.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

028 Hydrogen Recombiner and Purge Control System (HRPS)

028 K6.01 Knowledge of the effect of a loss or malfunction on the following will have on the HRPS: Hydrogen recombiners
(CFR: 41.7 / 45.7)

Importance Rating:	2.6 3.1
Technical Reference:	FSAR Section 6.2.5, Combustible Gas Control in Containment design basis item # 6
References to be provided:	None
Learning Objective:	PAHC Student Text Obj 2
Question Origin:	New
Comments:	None
Tier/Group:	T2G2

60. Which ONE of the following describes the primary means of returning the fuel transfer cart to the Fuel Handling Building (FHB) if a failure of the fuel transfer cart roller chain occurs when a used fuel assembly is on the cart in accordance with FHP-020, Refueling Operations?

A. Divers attach a retrevial tool and pull the cart back to the FHB

B. A pusher arm on the Containment side pushes the cart back to FHB

C. An emergency pull-out cable is used to pull the cart back to the FHB

D. A redundant roller chain on the Containment side transfers the cart to the FHB

Plausibility and Answer Analysis

Reason answer is correct:

A. Incorrect. Plausible to use divers since would be something that could be done with an underwater operation, this was previously performed due to damaging the emergency cable. Since the possiblility of extremely high radiation exists in the area of the fuel transfer cart when a fuel assembly is in the cart an emergency pull cable was installed to retrieve the cart during this type of failure.

B. Incorrect. Plausible since having a pusher arm installed on the cart would be a possibility to return the cart to the FHB side. But instead an emergency pull cable has been installed on the cart to retrieve the cart during this type of failure.

C. Correct.

D. Incorrect. Plausible since most nuclear safety features have redundant equipment but in this case an emergency pull cable has been installed on the cart to retrieve the cart during this type of failure.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

034 Fuel Handling Equipment System (FHES)

034 G2.4.31 Knowledge of annunciator alarms, indications, or response procedures. (CFR: 41.10 / 45.3)

Importance Rating:	4.2 4.1
Technical Reference:	FHP-020, Attachment 9, Page 148, Rev. 49
References to be provided:	None
Learning Objective:	FHS Student Text Obj 2F
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G2

61. Which ONE of the following completes the statement below concerning the Waste Gas System?

    Hydrogen concentration in the Waste Gas System, downstream of the catalytic recombiners, is limited to ___(1)___ by volume to ___(2)___ .

    A. (1) 2%

       (2) maintain levels below flammability limits

    B. (1) 2%

       (2) ensure proper operation of the recombiner

    C. (1) 4%

       (2) maintain levels below flammability limits

    D. (1) 4%

       (2) ensure proper operation of the recombiner

Plausibility and Answer Analysis

Reason answer is correct: *OP-120.07, Waste Gas Processing P&L 17 states: The flammability of a hydrogen-oxygen gas mixture is a function of composition, temperature and pressure. The lower flammability limit of an oxygen-hydrogen-nitrogen gas mixture is of prime interest since they are typical Recombiner feed gas constituents. The lower flammability limit for this mixture with respect to hydrogen is 4% by volume. Any mixture of hydrogen, oxygen and nitrogen containing less than 4% by volume hydrogen, is nonflammable.*

A. *Incorrect. The first part is plausible since Tech Specs 3.11.2.5 requires that the concentration of oxygen in the WGPS douwnstream of the hydrogen recombiners be limited to $\leq$ 2% by volume whenever the hydrogen concentration exceeds 4% by volume. The second part is correct.*

B. *Incorrect. The first part is plausible since Tech Specs 3.11.2.5 requires that the concentration of oxygen in the WGPS douwnstream of the hydrogen recombiners be limited to $\leq$ 2% by volume whenever the hydrogen concentration exceeds 4% by volume. The second part is plausible since operation of the recombiner is dependent upon the proper mixture of hydrogen and oxygen but the oxygen is added to the system to recombine with the hydrogen.*

C. *Correct.*

D. *Incorrect. The first part is correct. The second part is plausible since operation of the recombiner is dependent upon the proper mixture of hydrogen and oxygen but the oxygen is added to the system to recombine with the hydrogen.*

QUESTIONS REPORT

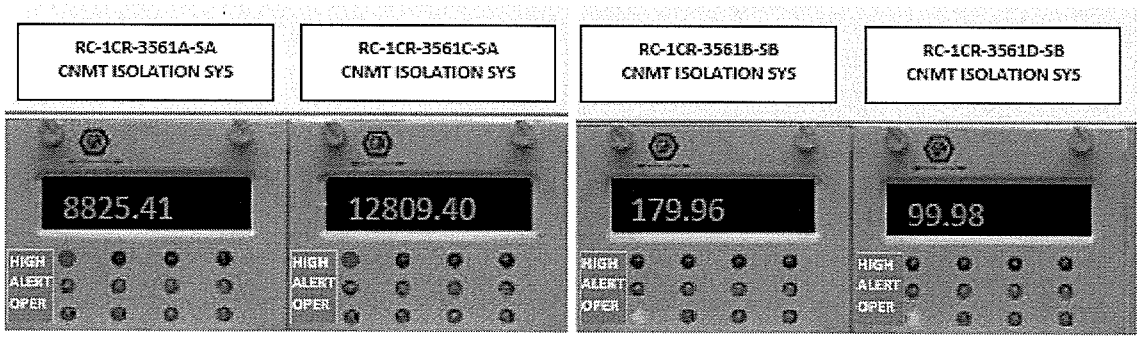
for 2013 NRC SRO REV 5 Written Exam Submittal

071 Waste Gas Disposal System (WGDS)

071 K5.04 Knowledge of the operational implication of the following concepts as they apply to the Waste Gas Disposal System: Relationship of hydrogen/oxygen concentrations to flammability
(CFR: 41.5 / 45.7)

Importance Rating:	2.5 3.1
Technical Reference:	OP-120.07, P&L #17 page 11, Rev. 60 and Tech Specs 3.11.2.5
References to be provided:	None
Learning Objective:	GWPS Student Text Obj 1
Question Origin:	New
Comments:	None
Tier/Group:	T2G2

62. Given the following plant condition:
    - CVI rad monitors indicate as follows:



Which ONE of the following is directly caused during these conditions?

A. Containment Vacuum Relief dampers (CB-D51 SA and CB-D52 SB) receive a CLOSE signal.

B. Airborne Radioactivity Removal fan (S-1A or B) that has it's MCB switch in 'AUTO' will START.

C. Containment Isolation Phase "A" isolation valves receive a CLOSE signal.

D. Containment Pre-entry Purge Makeup fans AH-81A/B receive a TRIP signal.

Reason answer is correct: *Two of the four CVI rad monitors 3561A-D will initiate a Containment Ventilation Isolation signal. Both Containment Outside Air intake dampers (CB-D51 SA and CB- D52 SB) will close.*

A. Correct.

B. Incorrect. Plausible if an auto start signal is believed to be generated by high radiation. The fans do have an auto start feature but the ARR fans do not auto start on high radiation. Each fan is manually controlled from the MCB by operator actions. Auto starts after 12 second delay with MCB switch in 'AUTO' if the running ARR fan trips on: high temperature of 280°F, Motor overload, Low flow, or Charcoal filter trouble alarm. Additionally, the ARR fans are interlocked to pprevent simultaneous operation of the fans. Therefore, if you assumed the normal lineup of one fan operating, the standby fan is interlocked to prevent it from starting.

C. Incorrect. Plausible because one could assume that if the radiation monitors for Containment Ventilation were in high alarm the entire Containment should be isolated. But Phase A isolation only occurs from High Containment pressure of 3 psig (2 of 4 channels), SI actuation or manually from MCB switches. Phase A does not have an input from high radiation conditions sensed by the CVI area radiation monitors.

D. Incorrect. Plausible because the fans will be off but not due to a CVI signal. AH-81A/B do not directly receive a trip signal from a Containment Ventilation Isolation signal. They trip due to the interlock when both Conatinment Pre-entry Purge Exhaust fans are OFF. The CPPE fans will be OFF because they receive a TRIP signal from the CVI signal.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

072 Area Radiation Monitoring (ARM) System

072 A3.01 Ability to monitor automatic operation of the ARM system, including: Changes in ventilation alignment
(CFR: 41.7 / 45.5)

Importance Rating:	2.9 3.1
Technical Reference:	OMM-004 Rev. 35, Attachment 7 page 52, AOP-005, Attachment 1 page 8, Rev. 28
References to be provided:	None
Learning Objective:	Lesson plan CVS Objective 1
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G2

63. Given the following plant conditions:
    - The plant is operating in Mode 4 preparing to start up
    - The Cooling Tower return is being aligned in accordance with OP-141, Cooling Tower And Reservoir Complex

    Which ONE of the following completes the statement below?

    Opening of a Cooling Tower Bypass valve, 1CW-77, Cooling Tower Bypass Valve #1, will ___(1)___ the back pressure caused by the Cooling Tower risers on the NSW system resulting in ___(2)___ service water flow.

    A. (1) reduce

       (2) more

    B. (1) reduce

       (2) less

    C. (1) raise

       (2) more

    D. (1) raise

       (2) less

Reason answer is correct: *The cooling tower bypass valve route the returning circulating and service water directly to the cooling tower basin at a lower elevation and will reduce the backpressure caused by the Cooling tower risers on the NSW system. Because of the lower backpressure the flow through the NSW system is less restricted and results in more service water flow through the system.*

A. Correct.

B. Incorrect. The first part is correct. The second part is plausible because the reduction in flow to the NSW components will cause the components to overheat and overheating of the components will lead to distortion which can lead to high vibrations in rotating equipment cooled by NSW.

C. Incorrect. The first part is plausible because the cooling tower has deicing valves located at the top of the cooling tower risers and the opening of the deicing valve will pressurize additional piping in the system and raise the back pressure on the NSW system. The second part is correct.

D. Incorrect. The first part is plausible because the cooling tower has deicing valves located at the top of the cooling tower risers and the opening of the deicing valve will pressurize additional piping in the system and raise the back pressure on the NSW system. The second part is plausible because the reduction in flow to the NSW components will cause these components to overheat and overheating of the components will lead to distortion which can lead to high vibrations in rotating equipment cooled by NSW.

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

075 Circulating Water System

075 K1.01 Knowledge of the physical connections and/or cause effect relationships between the circulating water system and the following systems: SWS
(CFR: 41.2 to 41.9 / 45.7 to 45.8)

Importance Rating:	2.5 2.5
Technical Reference:	OP-139, Rev 104, pg 9, P&L 14
References to be provided:	None
Learning Objective:	SWS Student Text Obj 8
Question Origin:	New
Comments:	None
Tier/Group:	T2G2

64. Given the following plant conditions:
    - The plant is operating at 100% power
    - A rupture in the Instrument Air system has occurred
    - Instrument Air header pressure is 80 psig and lowering slowly

    Which ONE of the following completes the statement below?

    1SA-506, Instrument Air from Service Air Isolation Valve, is ___(1)___ AND ALB-002-8-1, Instrument Air Low Pressure Alarm, is ___(2)___.

    A. (1) OPEN

       (2) Lit

    B. (1) OPEN

       (2) NOT Lit

    C. (1) CLOSED

       (2) Lit

    D. (1) CLOSED

       (2) NOT Lit

Reason answer is correct: *SA-506 shuts at 90 psig. The alarm, however, will not come in until 75 psig.*

A. *Incorrect. SA-506 closes at 90 psig. Plausible if candidate confuses the setpoint for autoclosure with one of the other IA setpoints (101, 96, 95, 90, 85, 75, 60, and 35 are all significant Instrument Air Pressure Setpoints. See Attachment 7 of AOP-017). Alarm will NOT be lit. Plausible if candidate believes an alarm will alert operators to the condition prior to the automatic action occurring*

B. *Incorrect. 1SA-506 will shut automatically at 90 psig. Plausible if candidate confuses the setpoint for autoclosure with one of the other IA setpoints (101, 96, 95, 90, 85, 75, 60, and 35 are all significant Instrument Air Pressure Setpoints. See Attachment 7 of AOP-017)*

C. *Incorrect. 1 SA-506 will close automatically to isolate the Service Air System from the Instrument Air system, however the alarm is not lit until 75 psig. Plausible if candidate believes an alarm will alert operators to the condition prior to the automatic action occurring.*

D. *Correct.*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

079 Station Air System (SAS)

079 A4.01 Ability to manually operate and/or monitor in the control room: Cross-tie valves with IAS
(CFR: 41.7 / 45.5 to 45.8)

Importance Rating:	2.7 2.7
Technical Reference:	AOP-017 Rev. 35, Attachment 7, page 57 APP-ALB-002 Rev 48, page 39
References to be provided:	None
Learning Objective:	AOP3-17 Obj. 2
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G2

65. Given the following plant conditions:
    - A fire occurred on site
    - Fire header pressure lowered to 90 psig
    - Fire header pressure is now 125 psig and stable

    Which ONE of the following completes the statements below?

    The Motor-Driven Fire Pump is ___(1)___.

    The Diesel Driven Fire Pump is ___(2)___.

    A. (1) OFF

       (2) OFF

    B. (1) RUNNING

       (2) OFF

    C. (1) OFF

       (2) RUNNING

    D. (1) RUNNING

       (2) RUNNING

Reason answer is correct: *The Motor Driven Fire Pump AUTO starts at 100 psig and will run after an auto start condition until it is manually stopped. The Diesel Driven Fire Pump starts at 83 psig (after an 8 second time delay) and also must be manually stopped if auto started. If Fire header system pressure decreased to 90 psig then the MD Fire pump should have started and the standby Diesel Driven Fire Pump would NOT have started. Since either pump will remain running until manually stopped the MD Fire pump would still be running.*

A. Incorrect. *Plausible since a thermal detector will align the preaction sprinkler system to wet the dey pipe but will not flow water until the sprinkler head is melted. auto start pressure for the MD pump and the DD pump are no longer low enough to cause either pump to start. Since fire header pressure decreased to < 100 psig the MD fire pump would have auto started and would continue to run until manually stopped.*

B. *Correct.*

C. Incorrect. *Plausible if the candidate gets the auto start pressures reversed between the two pumps. In that case the Diesel Driven pump would still be running and the Motor Driven pump would be off.*

D. Incorrect. *Plausible since the Motor Driven pump would have started and would still be running until manually secured. The Diesel Driven pump starting and continuing to run is plausible if both pumps started at the same pressure or if the pressure set point for the Diesel Driven pump is thought to be 90 psig (which is the pressure that anouther plant component - namely the Service Air valve - operates).*

QUESTIONS REPORT

for 2013 NRC SRO REV 5 Written Exam Submittal

086 Fire Protection System (FPS)

086 K4.02 Knowledge of design feature(s) and/or interlock(s) which provide for the following: Maintenance of fire header pressure
(CFR: 41.7)

Importance Rating:	3.0 3.4
Technical Reference:	ALB-030-7-2, Fire Pump System Trouble, Page 27, Rev. 32, Fire Protection Student text MD and DD Fire Pump pressure start feature
References to be provided:	None
Learning Objective:	FP Objective 9
Question Origin:	Bank
Comments:	None
Tier/Group:	T2G2

66. Which ONE of the following completes the statement below describing the location and control of the Security Master Key in the control room that provides access to plant vital areas?

The Security Master Key is located in a locked ___(1)___ which is controlled by ___(2)___ .

A. (1) box in SM desk

(2) the SM

B. (1) box in SM desk

(2) Security

C. (1) 'break-glass' key cabinet

(2) the SM

D. (1) 'break-glass' key cabinet

(2) Security

Plausibility and Answer Analysis

Reason answer is correct: Per OMM-001, Operations Administrative Requirements, Section 5.1.7.6 states that the "security master key is located in the Main Control Room in adn a locked, break glass key cabinet. The keys to this cabinet are controlled by Security."

A. Incorrect. Plausible since the SM desk contains a locked box but the box contains the kirk keys and is under the SM control.

B. Incorrect. Plausible since the SM desk contains a locked box but the box contains ASI Squib Valve Locked Storage Container key, 'C' CSIP Manual Transfer Switch key, and spare KIRK Keys for CSIP and CCW breakers. The locked box is under the SM control not Security. Since Security does control the locked 'break glass' cabinet "Security" is plausible.

C. Incorrect. The first part is correct. The second part is plausible since the SM desk contains a locked box but the box contains the kirk keys and is under the SM control.

D. Correct.

2.1 Conduct of Operations

G2.1.13 Knowledge of facility requirements for controlling vital/controlled access.
(CFR: 41.10 / 43.5 / 45.9 / 45.10)

Importance Rating:	2.5 3.2
Technical Reference:	OMM-001, section 5.1.7, #6, Rev. 96
References to be provided:	None
Learning Objective:	ONO-LP-3.0, Lesson Objective 2.f, Rev. 2
Question Origin:	Bank
Comments:	None
Tier/Group:	T3

67. Which ONE of the following describes a use for Standing Instructions?

To provide:

A. instructions or information of long-term significance.

B. instructions to allow departure or deviation from an approved procedure.

C. instructions that can be used in place of an existing approved procedure.

D. guidance in dealing with various types of plant problems to assure consistency between shifts.

Plausibility and Answer Analysis

Reason answer is correct: *Standing Instructions should be used for the following types of information:*

1) Guidance in dealing with various types of plant problems to assure consistency between shifts.

2) Descriptions of significant plant problems or events (including root cause when possible). These would include such items as significant incidents, reportable events, unit trips, etc.

3) Emegency technical specification changes which have NOT been formally issued but granted by phone.

A. Incorrect. Plausible since this is an example of an item specifically addressed in OPS-NGGC-1314 detailing what Standing Instructions should not be used for.

B. Incorrect. Plausible since this is an example of an item specifically addressed in OPS-NGGC-1314 detailing what Standing Instructions should not be used for.

C. Incorrect. Plausible since this is an example of an item specifically addressed in OPS-NGGC-1314 detailing what Standing Instructions should not be used for.

D. Correct.

2.1 Conduct of Operations

G2.1.15 Knowledge of administrative requirements for temporary management directives, such as standing orders, night orders, Operations memos, etc. (CFR: 41.10 / 45.12)

Importance Rating:	2.7 3.4
Technical Reference:	OPS-NGGC-1314 Section 9.3.1, Page 14, Rev. 0
References to be provided:	None
Learning Objective:	PP-LP-3.1, Shift Turnover and Shift Communications, Objective 4, Rev. 11
Question Origin:	Bank
Comments:	None
Tier/Group:	T3

68. Given the following plant conditions:
    - The unit is operating at 100% power
    - A manual blend to the RWST is being performed in accordance with OP-107.01, CVCS Boration, Dilution, and Chemistry Control

The following annunciators alarm:
- ALB-007-4-3, VCT High-Low Level
- ALB-007-5-5, Computer Alarm Chem & Vol Systems
- ALB-006-8-3, Boric Acid Auto Make-Up Signal Blocked

Plant Computer provides the following information:

ERFIS ID	Description	Value and Trend
TCS0381	BTRS Demin Bed Inlet Temp	145°F and lowering
LCS0112	VCT Level	86% and rising
ZCS0246	1CS-50 LTDN Demin Divert	VCT

Assuming NO operator action, which ONE of the following identifies the failing indicator AND the status of Emergency Makeup from the RWST?

	Failing indicator	Emergency Makeup Status
A.	LT-115 failing LOW	Available
B.	LT-115 failing LOW	Unavailable
C.	LT-112 failing HIGH	Available
D.	LT-112 failing HIGH	Unavailable

Reason answer is correct: *LT-112 is failing high. At 70% this caused a Divert to the RHT to begin. Actual level began lowering. At 80% a Full Divert to the RHT occurred. When LT-115 reached 20% it attempted to start an auto makeup but that can't occur while a manual blend is in progress to the RWST. Therefore level continues to lower. Emergency Makeup is unavailable until the leads on LT-112 are lifted since the instrument is failing high.*

A. Incorrect. *Plausible since indications are that either 115 is failing low or 112 is failing high. If LT-115 were failing low then at 20% it would have started an automatic makeup. At that point actual level would have begun increasing. (Auto makeup in this case isn't available due to manual make up to RWST so level would remain relatively constant.) Computer point for FCV-115A (1CS-120) indicates that a Divert to the RHT has occurred. This indicates that actual plant conditions are such that no makeup is going to the VCT.*

B. Incorrect. *Conditions are not consistent with a LT-115 failure (see above). If LT-115 had failed low then Emergency Makeup would still be considered available since 2/2 at the low setpoint is all that's required. Only becomes unavailable when indicator fails high*

C. Incorrect. *LT-112 is the failing instrument, but emergency makeup requires 2 out 2 indicators at the low setpoint and will not be available if one indicator has failed high.*

D. *Correct.*

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2.1 Conduct of Operations

G2.1.19 Ability to use plant computers to evaluate system or component status. (CFR: 41.10 / 45.12)

Importance Rating:	3.9 3.8
Technical Reference:	AOP-003, Section 3.1 and Attachment 5, page 35, Rev. 28, ALB-006-8-3
References to be provided:	None
Learning Objective:	CVCS Objective 12.e
Question Origin:	Bank
Comments:	None
Tier/Group:	T3

69. Given the following plant conditions:
    - The unit is operating at 100% power
    - Troubleshooting is in progress on the 1A-SA ESCW Chiller in accordance with AP-929, Troubleshooting Guide
    - Leads must be lifted in the Control Circuit to support the troubleshooting
    - The lead lift does not pose a risk of personnel injury or equipment damage

    Which ONE of the following identifies the acceptable methods of documenting the lead lift in accordance with AP-929?

    1. Clearance Order (OPS-NGGC-1301, Equipment Clearance)
    2. Verification Sign-Off Sheet (OPS-NGGC-1303, Independent Verification)
    3. Component Manipulation Sign-Off Sheet (OPS-NGGC-1308, Plant Status Control)
    4. Add to the Work Order Instructions at the time of lift (ADM-NGGC-0104, Work Management Process)

    A. 1 and 2

    B. 2 and 3

    C. 3 and 4

    D. 1 and 4

Reason answer is correct: *Both OPS-NGGC-1303 and* OPS-NGGC-1308 are listed in *P&L#7 of AP-929*

A. Incorrect *OPS-NGGC-1303 is correct as listed in P&L#7 of AP-929 but OPS-NGGC-1301 is not. OPS-NGGC-1301 does maintain configuration but is used for safety of personnel and equipment and should not be used for configuration alone.*

B. Correct

C. Incorrect *OPS-NGGC-1308 is correct as listed in P&L#7 of AP-929 but adding to the Work Order Instructions at the time of lift is not. OPS-NGGC-1308 does allow use of a work order to maintain configuration but the components must be added to the work order during planning, not in the field.*

D. Incorrect *OPS-NGGC-1301 does maintain configuration but is used for safety of personnel and equipment and should not be used for configuration alone. OPS-NGGC-1308 does allow use of a work order to maintain configuration but the components must be added to the work order during planning, not in the field.*

2.2 Equipment Control

G2.2.20 Knowledge of the process for managing troubleshooting activities.
(CFR: 41.10 / 43.5 / 45.13)

Importance Rating:	2.6 3.8
Technical Reference:	AP-929, Page 15, P&L #7, Rev. 17
References to be provided:	None
Learning Objective:	LP-2.0/3.0, Conduct of Operations, Objective 2.f, rev. 13
Question Origin:	Bank
Comments:	None
Tier/Group:	T3

70. Given the following plant conditions:
    - The unit is operating at 100% power
    - Makeup to the 'C' SI Accumulator has just been completed
    - 'C' SI Accumulator parameters are as follows:

Boron Concentration	2419 ppm
Pressure	670 psig
Level	68%

Based on the current conditions of the 'C' SI Accumulator, which ONE of the following describes (1) the action required in accordance with Technical Specifications AND (2) the basis for this Technical Specification?

A. (1) Restore level to within limits within 1 hour.

   (2) To minimize the potential for reaching unacceptable peak cladding temperatures during a LOCA with postulated failure of 1 other SI Accumulator.

B. (1) Restore level to within limits within 1 hour.

   (2) To maintain the partially recovered core during the early reflooding phase of a Large Break LOCA subcritical.

C. (1) Restore pressure to within limits within 1 hour.

   (2) To minimize the potential for reaching unacceptable peak cladding temperatures during a LOCA with postulated failure of 1 other SI Accumulator.

D. (1) Restore pressure to within limits within 1 hour.

   (2) To maintain the partially recovered core during the early reflooding phase of a Large Break LOCA subcritical.

Plausibility and Answer Analysis

Reason answer is correct: *Boron Concentration is within the limits of 2400 and 2600 ppm. Pressure is above the limits of 585 and 665 and could have resulted from filling the Accumulator. Level is within the normal band of between 66 and 96%. With Accumulator pressure outside the limits in accordance with Technical Specification the Accumulator would be declared inoperable and TS 3.5.1 Action a would apply:*

> *With one accumulator inoperable, except as a result of a closed isolation valve or boron concentration not within limits, restore the inoperable accumulator to OPERABLE status within 1 hour.*
>
> *The Technical Specification basis for the limits are that they minimize the time exposure of the plant to a LOCA event occurring concurrent with failure of an additional accumulator which may result in unacceptable peak cladding temperautres.*

A. *Incorrect. The first part is plausible since this would be correct if the level was outside the band of 66 to 96%. The second part is correct.*

B. *Incorrect. The first part is plausible since this would be correct if the level was outside the band of 66 to 96%. The second part is plausible since this is the reason that the boron concentration in the Accumulator is kept within limits of 2400 to 2600 ppm.*

C. *Correct.*

D. *Incorrect. The first part is correct. The second part is plausible since this is the reason that the boron concentration in the Accumulator is kept within limits of 2400 to 2600 ppm.*

2.2 Equipment Control

G2.2.39 Knowledge of less than or equal to one hour Technical Specification action statements for systems.
(CFR: 41.7 / 41.10 / 43.2 / 45.13)

Importance Rating:	3.9 4.5
Technical Reference:	Technical Specification 3.5.1
References to be provided:	None
Learning Objective:	SIS Objective 10.b
Question Origin:	New
Comments:	None
Tier/Group:	T3

71. Given the following plant conditions:
    - Several Fuel Handling Building (FHB) area radiation monitors on both trains have reached the High Alarm setpoint
    - AOP-005, Radiation Monitoring System, has directed the operator to verify that the FHB ventilation has shifted to the Emergency Exhaust lineup

    Which ONE of the following alignments completes the statements below?

    FHB Operating Floor Supply Fans (AH-56, AH-57, AH-58, AH-59) are ___(1)___ .

    FHB Normal Exhaust Isolation Dampers (FL-D4, FL-D5, FL-D21, FL-D22) are ___(2)___ .

    A. (1) SECURED

       (2) OPEN

    B. (1) RUNNING

       (2) OPEN

    C. (1) SECURED

       (2) SHUT

    D. (1) RUNNING

       (2) SHUT

    Plausibility and Answer Analysis

    Reason answer is correct: *Both trains of FHB will be in the emergency ventilation alignment, which includes Emergency Exhaust fans running with inlet dampers open, all normal fans secured and operating floor dampers shut. This flow path will filter the exhaust prior to release.*

    A. Incorrect. Plausible since these FHB components get an actuation signal, but the FHB Normal Exhaust Isolation Dampers are not properly aligned.

    B. Incorrect. Plausible since these FHB components get an actuation signal, but the FHB Normal Exhaust Isolation Dampers and the FHB Operating Floor Supply Fans are not properly aligned.

    C. Correct.

    D. Incorrect. Plausible since these FHB components get an actuation signal, but the FHB Operating Floor Supply Fans are not properly aligned.

2.3 Radiation Control

G2.3.11 Ability to control radiation releases.
(CFR: 41.11 / 43.4 / 45.10)

Importance Rating:	3.8 4.3
Technical Reference:	OP-170, Section 8.1, Auto Start of Emergency Exhaust System, Pages 23-24, Rev. 25
References to be provided:	None
Learning Objective:	RMS-LP-3.0-9
Question Origin:	Bank
Comments:	None
Tier/Group:	T3

72. Given the following plant conditions:
    - A Refueling Outage is in progress
    - You have been assigned a task in the RCA, have been briefed and are preparing to sign on to the RWP
    - The survey map records the radiation levels as 1750 mRem/hour in the general area

    The classification for this area would be a ___(1)___ High Radiation Area. If this area is where no enclosure can reasonably be constructed around it then ___(2)___ that is activated at the area as a warning device.

    A. (1) Very

       (2) barricade and conspicuously post the area and have a clearly visible flashing light

    B. (1) Very

       (2) rope off the area with yellow and magenta radiation rope, and have an audible hazard alarm

    C. (1) Locked

       (2) barricade and conspicuously post the area and have a clearly visible flashing light

    D. (1) Locked

       (2) rope off the area with yellow and magenta radiation rope, and have an audible hazard alarm

Reason answer is correct: HPS-NGGC-0003 defines a Locked High Radiation Area (LHRA) as an area where a radiation field in excess of 1000 mRem in 1 hour at 30 cm exists. A Very High Radiation Area (VHRA) is an area where a radiation field in excess of 500 rads in 1 hour at one meter exists. The radiation level in the question is 1750 mRem/hour. This radiation field would make the classification of this area a LHRA.

A. *Incorrect. The first answer is plausible because a VHRA is the next higher radiation area classification. The second part of the answer is plausible because the Lead RC Technician is the person who obtains approval for entries into LHRAs and assigns RC Technicians to perform job coverage in LHRAs.*

B. *Incorrect. The first answer is plausible because a VHRA is the next higher radiation area classification. The second part of the answer is correct.*

C. *Correct.*

D. *Incorrect. The first part of the answer is correct. The second part of the answer is plausible because the Lead RC Technician is the person who obtains approval for entries into LHRAs and assigns RC Technicians to perform job coverage in LHRAs.*

Given the following plant conditions:
- A Refueling Outage is in progress
- You have been assigned a task in the RCA and are preparing to sign on to the Operations RWP
- The survey map records the radiation levels as 1050 mRem/hour in the general area

Which ONE of the following describes the classification of this area and the MINIMUM approval authority?

	Area Classification	Individual Approving Entry
A.	Very High Radiation Area	Lead Radiation Control Technician
B.	Very High Radiation Area	Radiation Control Supervisor
C.	Locked High Radiation Area	Lead Radiation Control Technician
D.	Locked High Radiation Area	Radiation Control Supervisor

2.3 Radiation Control

G2.3.12 Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.
(CFR: 41.12 / 45.9 / 45.10)

Importance Rating:	3.2 3.7
Technical Reference:	HPS-NGGC-0003, Page 5, Rev. 15, Tech Spec Administrative Controls
References to be provided:	None
Learning Objective:	LP-PP-3.7, Obj. 2
Question Origin:	Modified 2012 NRC Exam, RO 70 by changing the radiation field and changing the second part of the question to a new question.
Comments:	None
Tier/Group:	T3

73. Given the following plant conditions:
    - The reactor has tripped and Safety Injection has actuated due to a Large Break Loss of Coolant Accident (LOCA).
    - The crew is implementing E-1, Loss of Reactor Or Secondary Coolant
    - The OAC reports the following for Critical Safety Function Status Trees:
        - Containment - Orange
        - Subcriticality - Orange
        - Heat Sink - Red
        - Integrity - Red
        - All others are Green

    Which ONE of the following identifies the required procedure transition AND what it is based on?

    A. FR-C.2, Response to Degraded Core Cooling, based on a Severe Challenge to the Core Cooling

    B. FR-Z.1, Response to High Containment Pressure, based on an Severe Challenge to the Containment

    C. FR-S.2, Response to Loss of Core Shutdown, based on an Severe Challenge to the Subcriticality

    D. FR-H.1, Response to Loss of Secondary Heat Sink, based on an Severe Challenge to the Secondary Heat Sink

    Plausibility and Answer Analysis

    Reason answer is correct:: In accordance with the EOP-USERS-GUIDE, Section 5.2.2 determines priority of the CSFSTs as: Subcriticality, Core Cooling, Heat Sink, Integrity, Containment, and Inventory. Section 5.2.3, General Usage detemines RED as the highest priority followed by ORANGE, YELLOW and GREEN. It also describes how RED paths on lower priority trees must be addressed before ORANGE paths on higher priority trees due to the severe challenge to the safety function. Therefore, FR-H.1 is correct because it is the highest priority Red path CSFST.

    A. Incorrect. Plausible if the candidate believes that a Red path on the Integrity tree would require the transition to FR-C.2.

    B. Incorrect. Plausible if the candidate believes that and Orange path on the Containment Tree is a higher priority and would require transition to FR-Z.1

    C. Incorrect. Plausible due to the Subcriticality tree being the highest priority tree but an Orange Path is not a higher priority than a Red path.

    D. Correct.

QUESTIONS REPORT

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2.4 Emergency Procedures / Plan

G2.4.22 Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.
(CFR: 41.7 / 41.10 / 43.5 / 45.12)

Importance Rating:	3.6 4.4
Technical Reference:	EOP Users-Guide, Rev. 41, pg 20, 21
References to be provided:	None
Learning Objective:	EOP-LP-3.19 Obj 2.b
Question Origin:	Bank
Comments:	None
Tier/Group:	T3

74. Given the following plant conditions:
    - AOP-036, Safe Shutdown Following a Fire, is being performed
    - Normal CST MCB level indicators LI-9010A1 SA & LI-9010B1 SB have been disabled by the fire

In accordance with AOP-036 Basis Document, which ONE of the following would be used to make a determination of CST level?

A. Local CST level indicator LI-9011

B. AFW Pump suction pressure

C. AFW Pump discharge pressure

D. Condensate Transfer Pump suction pressure

Plausibility and Answer Analysis

Reason answer is correct: The safe shutdown function performed by the AFW system is reactor heat removal during hot standby. The CST supplies the AFW pump suction head. Thus, AFW pump suction pressure is directly related to the water level in the CST. This has been correlated into a graph to provide an alternate method of monitoring CST level.

A. Incorrect *Plausible since a local indication of tank level would be thought of to be used for level indication. But the CST local level indicator is not used (due to access and communication difficulties from this location) and instead the AFW Pump suction pressure is used with a graph to determine the CST level.*

B. Correct

C. Incorrect *Plausible since pump discharge pressure could be indicative of tank level. If the discharge pressure is not fluctuating then the pump is not caviting which could indicate that there is adequate level to maintain pump operation.*

D. Incorrect *Plausible since this pump takes a suction on the CST but the design of the CST has the Last 270,000 gallons of CST inventory only available to AFW pumps. Ensures sufficient fluid to maintain hot standby for 6 hours and still achieve cold shutdown.*

QUESTIONS REPORT
for 2013 NRC SRO REV 5 Written Exam Submittal
2.4 Emergency Procedures / Plan

G2.4.27 Knowledge of "fire in the plant" procedures.
(CFR: 41.10 / 43.5 / 45.13)

Importance Rating:	3.4 3.9
Technical Reference:	AOP-036 Basis Document Attachment for AFW Pump Suction Pressure vs. CST Level information, page 23, Rev. 16, AOP-036.02 Attachment 3, page 100, Rev. 16
References to be provided:	None
Learning Objective:	AOP-036 Obj 3
Question Origin:	Bank
Comments:	None
Tier/Group:	T3

75. Given the following plant conditions:
    - At 1503, a steam generator tube leak is identified.
    - At 1519, a plant shutdown is commenced due to exceeding TS leakage limits.
    - At 1520, an Unusual Event is declared by the Site Emergency Coordinator. (SEC)
    - At 1522, a reactor trip occurs.
    - At 1528, the crew identifies SG "A" as the ruptured SG.
    - At 1531, an ALERT is declared by the SEC.

    Which ONE of the following describes the latest time that the INITIAL notification to State/County officials AND the NRC is due?

	State/County	NRC
A.	1535	1535
B.	1535	1620
C.	1546	1620
D.	1546	1631

Plausibility and Answer Analysis

Reason answer is correct: *15 minutes after declaration of event to notify state. One hour to notify NRC*

A. Incorrect. Plausible if candidate believes NRC must also be informed within 15 minutes.

B. Correct.

C. Incorrect. Plausible if candidate believes the 15 minute requirement doesn't apply to UE's but only Alerts and higher but still correctly identifies need to properly inform NRC.

D. Incorrect. Plausible if candidate believes notification time limits should be from the time of the ALERT, not the UE.

QUESTIONS REPORT

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2.4 Emergency Procedures / Plan

G2.4.29 Knowledge of the emergency plan.
(CFR: 41.10 / 43.5 / 45.11)

Importance Rating:	3.1 4.4
Technical Reference:	PEP-310, Attachment 2, Notification of state and local authorities, page 20, Rev. 27
References to be provided:	None
Learning Objective:	Emergency Action levels, EP2-0 Obj. 4.a
Question Origin:	Bank
Comments:	Modified the bank question times by changing all times to differnt values.
Tier/Group:	T3