2012 Ginna Initial License NRC Examination

SRO Written Examination

Applicant Information	
Name:	
Date: October 18, 2012	Facility/Unit: R.E. Ginna
Region: I	Reactor Type: Westinghouse
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination, you must achieve a final grade of at least 80.00 percent overall, with 70.00 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require a final grade of 80.00 percent to pass. You have 8 hours to complete the combined examination, and 3 hours if you are only taking the SRO portion.

Applicant Certification

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

____
Applicant's Signature

Results	
RO/SRO-Only/Total Examination Values	____ / ____ / ____ Points
Applicant's Score	____ / ____ / ____ Points
Applicant's Grade	____ / ____ / ____ Percent

Master Copy

RO Question # 1

Prior to starting the 'A' RCP to initiate a plant heatup, the following conditions exist:

- RHR system in service
- RCS filled and vented
- VCT pressure = 17 psig
- RCS pressure = 327 psig
- PRZR level = 50%
- 'A' Loop Cold Leg Temperature TI-409B = 170ºF
- 'B' Loop Cold Leg Temperature TI-410B = 157ºF
- 'A' S/G Handhold Temperature = 172ºF
- 'B' S/G Handhold Temperature = 160ºF
- 'A' RCP No.1 Seal D/P = 310 psid

For the given conditions, which of the following identifies a RCP starting requirement that is NOT satisfied?

A. VCT pressure

B. RCS pressure

C. No.1 Seal D/P

D. RCS to S/G ΔT

RO Question # 2

O-3.2, Shutdown Margin for an Operating Reactor, states that Tavg must be at program Tavg.

If O-3.2 is performed at 100% power with actual Tavg = 577°F (and control rods in Manual), the Shutdown Margin (SDM) on a subsequent reactor trip would be:

_(1)_ than the calculated SDM because the power defect would add _(2)_ positive reactivity on the reactor trip.

	(1)	(2)
A.	higher	more
B.	higher	less
C.	lower	more
D.	lower	less

RO Question # 3

The following conditions exist:

- MODE 3 at Normal Operating Temperature and Pressure, preparing for a normal Reactor Startup
- The RCS Boron level has been established at the value which the ECP was calculated
- Letdown Temperature Control valve controller, TCV-130 is in MANUAL
- All other controls are in AUTOMATIC and functioning normally

If the Letdown Relief Valve (RV-203) begins leaking to the PRT at a rate of 20 gpm and NO operator actions are taken, then Source Range counts will:

A. RISE due to cooler water exiting the Non-Regen letdown heat exchanger

B. RISE due to warmer water exiting the Non-Regen letdown heat exchanger

C. LOWER due to cooler water exiting the Non-Regen letdown heat exchanger

D. LOWER due to warmer water exiting the Non-Regen letdown heat exchanger

RO Question # 4

Which one of the following statements describes a basis, as explained in P-12, ELECTRICAL SYSTEMS PRECAUTIONS, LIMITATIONS, AND SETPOINTS, for why the generator trip circuit is designed to be time-delayed, such that the generator trip occurs later than the turbine trip on most turbine trips?

A. On a Large Break LOCA the RCP can overspeed causing the motor flywheel to become a missile hazard which could damage the containment liner or ECCS components in containment.

B. On a Large Break LOCA the RCP can overspeed causing the RCP impeller to become a missile hazard which could damage the containment liner or ECCS components in containment.

C. On a Turbine Trip causing a Reactor Trip the RCP is locked at 60 HZ for 60 seconds to prevent a power-to-flow concern upon reactor trip.

D. On a Turbine Trip causing a Reactor Trip the RCP is locked at 60 HZ for 60 seconds to prevent an RCS pressure transient upon reactor trip.

RO Question # 5

Which one of the following correctly identifies the valve position for RHR HX Bypass Flow Control Valve HCV-626: (1) on loss of Instrument Air and (2) on the failure of HCV-626 controller output to 100%?

	(1)	(2)
A.	Closed	Open
B.	Closed	Closed
C.	Open	Open
D.	Open	Closed

RO Question # 6

During a plant load increase, with reactor power at 48%, the following occur:

- Control Bank C group 1 rod G-7 dropped
- Rod recovery is underway per ER-RCC.1, Retrieval of a Dropped RCC
- C-30, ROD CONTROL URGENT FAILURE ROD STOP, is received

Which one of the following explains (1) why the alarm actuated and (2) what action is required?

A. (1) All bank C group 2 rods lift coils are deenergized;
(2) Continue with ER-RCC.1

B. (1) All other bank C group 1 rods lift coils are deenergized;
(2) Continue with ER-RCC.1

C. (1) Group C rod moving with group D rods withdrawn;
(2) Respond per AR-C-30

D. (1) The step counter of the pulse to analog (P/A) converter was not reset to 0;
(2) Respond per AR-C-30

RO Question # 7

The plant experienced a spurious SI. While performing E-0, the following plant conditions develop:

- RCS pressure lowers from 2000 psig and stabilizes at 900 psig
- Containment pressure, sump levels, and radiation levels are normal
- Auxiliary Building radiation levels are rising
- R-13, Plant Vent Particulate Monitor, is in alarm
- L-10, Aux Bldg Sump Auto Start annunciator has been received
- SI indications:

SI Pump "A" to RCS Loop "B"	
FI-924	0 gpm
PI-922	700 psig

SI Pump "B" to RCS Loop "A"	
FI-925	700 gpm
PI-923	1000 psig

Based upon these conditions and indications: (1) Identify the leak location and (2) What procedure will be used to mitigate this event?

A. (1) SI pump 'A' line to RCS loop 'B';
(2) ECA-1.2, LOCA Outside Containment

B. (1) SI pump 'A' line to RCS loop 'B';
(2) E-1, Loss of Reactor or Secondary Coolant

C. (1) SI pump 'B' line to RCS loop 'A';
(2) ECA-1.2, LOCA Outside Containment

D. (1) SI pump 'B' line to RCS loop 'A';
(2) E-1, Loss of Reactor or Secondary Coolant

RO Question # 8

The crew transitions to FR-H.1, Response to Loss of Secondary Heat Sink, 15 minutes after a reactor trip. Step 1 of FR-H.1 reads:

1 Check If Secondary Heat Sink Is Required:	
a. RCS pressure - GREATER THAN ANY NON-FAULTED S/G PRESSURE	a. IF RWST level greater than 28%, THEN return to procedure and step in effect. IF RWST level less than 28%, THEN go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

Which of the following explains the basis for transitioning from the FR-H.1 procedure in the RNO column?

A. Cold leg recirculation has not occurred. Must return to the procedure and step in effect and monitor RWST level

B. The intact SG is not functioning as a heat sink. Core decay heat can be removed by the faulted SG

C. Cold leg recirculation has not occurred. Must immediately transfer to cold leg recirculation

D. The intact SG is not functioning as a heat sink. Core decay heat can be removed by the RCS break flow

RO Question # 9

Given the following plant conditions:

- The plant has experienced an accident involving a significant and rapid reduction in RCS pressure
- Containment pressure is 35 psig and stable

For these types of accidents, indicated PRZR level will be __(1)__ than actual level and (2) Why?

A. (1) HIGHER
(2) These types of accidents will result in bubble formation in the reactor vessel and core uncovery

B. (1) LOWER
(2) These types of accidents will result in the inability to terminate SI when criteria are satisfied

C. (1) HIGHER
(2) These types of accidents result in large level-measurement errors due to hydrogen coming out of solution in the PRZR reference legs

D. (1) LOWER
(2) These types of accidents will result in the inability to regain normal PRZR pressure control

RO Question # 10

While operating at 100% power, a control bank 'D' rod dropped. The crew has entered ER-RCC.1, Retrieval of a Dropped RCC, and is ready to withdraw the dropped rod.

Per ER-RCC.1, Retrieval of a Dropped RCC, which of the following describes why the affected group step counter needed to be reset to zero?

A. This ensures that the P/A converter will send the proper rod height data to the RIL circuitry

B. This ensures that the rod is withdrawn to the proper height with a proper group step counter indication

C. This prevents a ROD CONTROL URGENT FAILURE annunciator from alarming during the rod recovery

D. This prevents a BANK D FULL ROD WITHDRAWAL annunciator from alarming during the rod recovery

RO Question # 11

Per UFSAR 6.2.2.2, in addition to heat removal, which one of the following is part of the design basis of the Containment Spray System for LOCA accidents?

A. Removes Hydrogen from the containment atmosphere

B. Removes Iodine from the containment atmosphere

C. Provides charcoal filter dousing

D. Lowers the pH of containment sump recirc water

RO Question # 12

A LOCA occurred approximately 5 hours ago.

Which one of the following states why simultaneous reactor vessel deluge and cold leg injection recirculation are initiated?

A. To reduce reactor vessel head temperature

B. To collapse steam voids in the upper reactor vessel region

C. To remove non-condensable gases from the reactor vessel

D. To flush concentrated boric acid from the core

RO Question # 13

Given the following conditions:

- The plant has experienced a large break LOCA with Loss of Offsite Power
- Neither EDG started automatically
- 'A' EDG was started from the main control board and Bus 14 and Bus 18 were manually loaded per ATT-8.5, ATTACHMENT LOSS OF OFFSITE POWER
- 'A' EDG load is currently 2155 KW

Which one of the following is (1) the LONGEST amount of time the diesel generator can be allowed to operate under these conditions, and (2) what action would be required to restore loading within limits.

	(1)	(2)
A.	0.5 hrs	reduce load by stopping redundant safeguards equipment
B.	0.5 hrs	no action required, loading will be reduced as the LOCA progresses
C.	2.0 hrs	reduce load by stopping redundant safeguards equipment
D.	2.0 hrs	no action required, loading will be reduced as the LOCA progresses

RO Question # 14

Given the following plant conditions:

- A large break LOCA has occurred
- Offsite power is available
- CNMT pressure is 22 psig and stable
- Both MSIVs are open
- SW pumps 'A' and 'D' were selected for auto start
- 'B' and 'C' SW pumps are running

For these conditions, per A-503.1, EMERGENCY AND ABNORMAL OPERATING PROCEDURES USERS GUIDE, which one of the following would require Manual Backup?

The failure of:

A. Automatic actuation of Containment Spray

B. Failure of 'A' and 'D' SW pumps to start

C. Automatic actuation of Main Steam Isolation

D. Automatic start of 'C' Safety Injection Pump

RO Question # 15

Given the following initial plant conditions:

- Plant at 100%, with a 50/50 normal electrical alignment.
- "B" CCW pump is in service.

Subsequently the following occurs:

- Offsite power circuit 767 trips
- The associated Emergency Diesel Generator fails to start

With no operator action, __(1)__ CCW pump will be running with __(2)__ CCW pump breaker red indicating light(s) lit on the MCB.

	(1)	(2)
A.	only A	only A
B.	only A	both
C.	only B	only B
D.	only B	both

RO Question # 16

For a trip of "A" Reactor Coolant Pump below P-8, which of the following correctly describes the effect on the "A" SG level IMMEDIATELY after the RCP trip, and WHY?

'A' S/G level will:

A. lower due to the decreased amount of steam in the riser allowing more water to flow into the riser from the downcomer

B. rise in response to a higher steam flow as sensed from a lower steam pressure

C. lower to follow the new programmed level for the lower value of turbine impulse chamber pressure

D. rise due to an increased steam flow to compensate for a lower enthalpy rise across the U-tubes

RO Question # 17

Which one of the following would result in a loss of manual operation of the pressurizer spray valve controllers?

A. "A" auto-static transfer switch swapped to the alternate supply and a subsequent loss of MCC-C

B. "A" auto-static transfer switch swapped to the alternate supply and a subsequent loss of MCC-D

C. "B" auto-static transfer switch swapped to the alternate supply and a subsequent loss of MCC-C

D. "B" auto-static transfer switch swapped to the alternate supply and a subsequent loss of MCC-D

RO Question # 18

Consider the following conditions:

- A LOCA has occurred
- CNMT pressure is 36 psig and stable
- All Containment Recirc Fans are running at design maximum current load
- The crew is performing E-1, preparing to start the 'A' charging pump (6 amps)
- Offsite power is available
- Bus 14 ammeter reads 268 amps

Which one of the choices below correctly completes the following statements explaining the concern with charging pump starting current under these conditions, and whether or not conditions allow starting the 'A' charging pump.

The bus maximum __(1)__ load rating can be exceeded by loading additional non-safeguards loads, which could result in loss of the bus and its associated safeguards loads. Starting 'A" charging pump __(2)__ cause bus loading limitations to be exceeded.

	(1)	(2)
A.	continuous;	will
B.	continuous;	will not
C.	transient;	will
D.	transient;	will not

RO Question # 19

Given the following:

- The plant was at full power with step counters reading:
  - Shutdown Bank: 223 steps
  - Control Bank A: 224 steps
  - Control Bank B: 225 steps
  - Control Bank C: 225 steps
  - Control Bank D: 217 steps
- A reactor trip occurred.
- Following the trip rod C-7 in Control Bank D indicated 212 steps on MRPI.
- All other rods indicated 0 steps on MRPI.

Which one of the following alarms will be present <u>due to rod C-7</u> immediately after reactor trip?

A. MCB alarm C-5, PPCS ROD SEQUENCE OR ROD DEVIATION

B. MCB alarm C-14, ROD BOTTOM

C. MRPI alarm Rod Deviation

D. MRPI alarm Rod Off Top

RO Question # 20

Assume the following plant conditions following a transient from 100% power:

- 90% power
- Tavg = 569ºF
- Group counter Bank D = 205 steps
- MRPI Rod C7 Bank D = 188 steps
- MRPI Rod K7 Bank D = 176 steps
- MRPI Rods G3 and G11 Bank D = 200 steps
- C-5, PPCS ROD SEQUENCE OR ROD DEVIATION, alarm lit
- F-29, PPCS AXIAL OR QUADRANT POWER TILT, alarm lit
- Rods are believed to be trippable
- The crew has entered AP-RCC.2, RCC/RPI Malfunction

Which one of the following describes the required action per AP-RCC.2?

A. Perform applicable portions of STP-O-1, ROD CONTROL SYSTEM

B. Insert Bank D to 200 steps and then realign rod K7

C. Shutdown per O-2.1, PLANT SHUTDOWN TO HOT SHUTDOWN

D. Withdraw control rods to restore Tavg to program

RO Question # 21

Given the following conditions:

- Unit is at 100% power
- PR Channel N-44 indication began oscillating and was removed from service IAW ER-NIS.3, PR Malfunction
- I&C installed the P-10 jumper IAW ER-NIS.3
- PR Channel N-43 subsequently fails high

Which one of the following describes (1) plant response and (2) how this subsequent failure impacts plant operation?

A. (1) The reactor remains at power, and (2) Rod Control must be placed in MANUAL to stop rod motion.

B. (1) The reactor remains at power, and (2) Rod Control motion is blocked by an Auto Rod stop.

C. (1) The reactor will trip, and (2) SR N31 and N32 must be manually reinstated.

D. (1) The reactor will trip, and (2) SR N31 and N32 will reinstate automatically when appropriate power level is reached.

RO Question # 22

- The plant is in Mode 5
- The RCS is at 0 psig and 115°F
- RCS loop level is at 35 inches when level begins rapidly lowering
- The crew enters the appropriate loss of RHR procedure as the running RHR pump begins to cavitate and is stopped
- The RO announces that level is 4 inches and is continuing to lower

Which one of the choices below identifies the RCS refill method that should be attempted first, in accordance with the preferred order of RCS refill methods provided in the AP?

A. SI Pumps to Hot Legs

B. Gravity Feed from the RWST

C. SI Pumps to Cold Legs

D. Charging to B Loop Cold Leg

RO Question # 23

Given the following:

- The plant is operating at 35% power.
- All systems are in their normal alignment.
- Pressurizer pressure transmitter, PT-429 failed high.
- Before PRZR pressure channel 429 could be defeated, Instrument Bus 'D' failed (de-energized).

Immediately in response to the instrument bus failure, an automatic reactor trip __(1)__ actuate, and automatic Safety Injection __(2)__ actuate.

	(1)	(2)
A.	will	will
B.	will	will not
C.	will not	will
D.	will not	will not

RO Question # 24

As a qualified licensed operator, you have been directed to verify a tagout development as the second verifier.

Which one of the following is correct regarding the Tagout Development verification process?

Per CNG-OP-1.01-1007, Clearance and Safety Tagging, the second verifier is permitted to -

A. perform a walkdown of the work area with the Tagout First Verifier to determine the hazards involved

B. discuss the tagout with the Tagout First Verifier to better understand the tagout boundary

C. consult with technical experts to ensure the adequacy of the isolation boundary

D. assess the tagout boundary using marked-up prints attached to the tagout request

RO Question # 25

The plant was stable at full power when an electrical short resulted in the "A" train SI block switch failing to the "block" position (electronics failure such that the block switch appears to be held in the "block" position).

Which one of the following states the effect this will have on SI actuation signals?

A. All "A" train SI signals are immediately blocked.

B. A" train S/G and PRZR auto SI signals will remain fully functional. The remaining "A" train SI signals are immediately blocked.

C. "A" train Manual and high containment pressure SI signals will remain fully functional. The remaining "A" train SI signals are immediately blocked.

D. "A" train manual and high containment pressure SI signals will remain fully functional. "A" train S/G and PRZR auto SI signals will be blocked when PRZR pressure lowers to block setpoint.

RO Question # 26

The crew has placed the Containment Mini-Purge system in service and notes that Containment Pressure is 0.4 psig and rising slowly.

If pressure continues to rise, the crew will be required to enter a Tech Spec Action statement at __(1)__ psig, which is the initial pressure used in the analysis for determining the peak pressure limit. The design basis accident for the peak pressure limit in Containment is __(2)__ .

A. (1) 0.5 psig; (2) Steamline break inside CNMT

B. (1) 1.0 psig; (2) Steamline break inside CNMT

C. (1) 0.5 psig; (2) LOCA

D. (1) 1.0 psig; (2) LOCA

RO Question # 27

Which one of the following correctly identifies an interlock associated with the penetration cooling fans?

A. Only one of the two fans can be run at a time

B. Fire protection switches trip the associated fan

C. High vibration trips the associated fan

D. High alarm on R-13, Plant Vent Particulate, trips the running fan and prevents start of the standby fan

RO Question # 28

- RCS cooldown from 350F is in progress per O-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD SHUTDOWN CONDITIONS
- 'A' RHR pump is running
- A 50 gpm CCW leak developed at a weld in the header downstream of FI-619, CCW HX OUTLET

Which of the following identifies the applicable flow limit that the CCW system will be operating closer to, as compared to system flow conditions prior to the leak?

A. 1000 gpm

B. 1800 gpm

C. 2400 gpm

D. 4900 gpm

RO Question # 29

Given the following:

- A loss of all AC power occurred 25 minutes ago.
- The crew is performing actions of ECA-0.0, Loss of All AC Power.
- 125 VDC power switches in REACTOR PROTECTION racks RLTR-1 and RLTR-2 have been turned OFF.
- AC Power has NOT been restored.

Which ONE of the following describes which Source Range (N-31, N-32) and Intermediate Range (N-35, N-36) NIS instruments are still available?

A. N-35 ONLY

B. N-31 and N-35 ONLY

C. N-32 and N-36 ONLY

D. N-31, N-32, N-35 ONLY

RO Question # 30

During movement of an irradiated fuel assembly from the core to the upender (not indexed over the core), the following events occur:

- Annunciator K-29, SFP HI TEMP 115ºF HI-LO LEVEL 20" 12", alarms
- Soon after the K-29 alarm, a report from the manipulator crane operator informs you in the control room that refueling cavity level is rapidly dropping
- Manipulator crane radiation monitor is in alarm
- Containment sump 'A' level is rising on LI-2039/2044 control room indication

Which ONE of the choices correctly completes the following statement per RF-601, Fuel Handling Accident Instructions, regarding required actions with respect to the fuel assembly being moved?

Position the fuel assembly over the designated ___(1)___, lower the assembly to the bottom position and __(2)___.

A. (1) core location, (2) leave the assembly latched

B. (1) core location, (2) unlatch the assembly

C. (1) location in the transfer slot, (2) leave the assembly latched

D. (1) location in the transfer slot, (2) unlatch the assembly

RO Question # 31

Given the following:

- The plant is at full power.
- Annunciator C-10, CONTAINMENT RECIRC CLRS WATER OUTLET LO FLOW, is lit.
- One SW pump is running.

Per the alarm response, annunciator C-10 alarms when Service Water flow from any CNMT Recirc Fan is less than __(1)__ gpm and either CNMT Recirc Fan(s) service water outlet (FCV-4561/FCV-4562) is full open; and, with only a single service water pump operating, refer to __(2)__ .

	(1)	(2)
A.	1100	AP-SW.1, Service Water Leak
B.	1100	AP-SW.2, Loss of Service Water
C.	1050	AP-SW.1, Service Water Leak
D.	1050	AP-SW.2, Loss of Service Water

RO Question # 32

Which one of the following describes the expected plant response to a controlling pressurizer pressure channel failure high while operating at 100% power?

Assume no operator action:

A. Actual pressure will lower until low pressure reactor trip and SI and then stabilize

B. Actual pressure will lower until low pressure reactor trip and then slowly rise back to program

C. Actual pressure will lower until the other control channel actuates heaters and then stabilize below program but above the trip setpoint

D. Plant will trip on high pressure trip but actual pressure will lower until low pressure SI and then stabilize

RO Question # 33

Given the following initial plant conditions:

- "A" CCW pump is out of service
- A simultaneous LOCA and loss of offsite power occurred.
- "B" DG failed to start.

A transition to FR-C.2, Response To Degraded Core Cooling, has just occurred with the following conditions:

- "A" RHR pump has been running for 30 minutes
- "A" and "D" SW pumps are running

Which one of the following describes operating limitations, if any, on "A" RHR pump?

A. No limitations. SW cools the pump mechanical seal cooler.

B. No limitations. An RHR pump recirculation flow path is available.

C. It can be run for a maximum of 30 minutes longer. Beyond that, pump failure can occur.

D. It can be run for a maximum of 60 minutes longer. Beyond that, motor failure can occur.

RO Question # 34

Given the following conditions:

- The RCS is at 350°F, going solid IAW O-2.2, Plant Shutdown from Hot Shutdown to Cold Conditions.
- The operators become distracted by reports of a welding gas bottle explosion in the turbine building.
- As a result of the passive failure of several overpressure protection components coupled with the distraction, RCS pressure rises and stabilizes at 2800 psig before operators respond.

Select the choice which correctly completes the following statement:

In accordance with the most time-limiting applicable Technical Specification, pressure must be reduced to restore compliance _________.

A. immediately

B. within 5 minutes

C. within 30 minutes

D. within 1 hour

RO Question # 35

The plant has experienced a LOCA, followed by an automatic SI initiation and containment spray actuation. The following conditions exist:

- 'D' CRFC out of service for maintenance
- Containment pressure = 40 psig and rising
- RHR pumps are in standby
- L-5, SAFEGUARD BUS MAIN BREAKER OVERCURRENT TRIP, is lit
- The normal supply breaker to Bus 16 opened and Bus 16 is de-energized

Which ONE of the following correctly describes plant conditions and/or operator actions with regard to containment peak design pressure and temperature limits?

A. There is adequate equipment available, per design, to maintain within limits

B. Limits, per design, will not be exceeded if 'D' CRFC is restored

C. Start an additional Service Water pump to maintain within limits

D. Limits, per design, will not be exceeded if 'B' EDG is manually started

RO Question # 36

Given the following:

- The plant is operating at 90% power
- A primary-to-secondary S/G tube leak is indicated by R-47 (Air Ejector Noble Gas Radiation Monitor)
- Per the procedure in effect, the AO closes V-996A, Inlet block valve to FI-2027 (S/G Blowdown HX 'A' outlet flow), and the R-19 (Steam Generator Blowdown) counts rise

(1) What specific indication is provided by this rise in counts, and (2) what would be the effect if counts continued to rise to the Alarm setpoint?

A. (1) Primary leakage is indicated on 'A' S/G;
(2) V-5737/5738, S/G Blowdown AOVs will close

B. (1) Primary leakage is indicated on 'B' S/G;
(2) V-5737/5738, S/G Blowdown AOVs will close

C. (1) Primary leakage is indicated on 'A' S/G;
(2) V-5709/5710, S/G 'A' and 'B' blowdown isolation AOVs to Blowdown Flash Tank will close

D. (1) Primary leakage is indicated on 'B' S/G;
(2) V-5709/5710, S/G 'A' and 'B' blowdown isolation AOVs to Blowdown Flash Tank will close

RO Question # 37

The plant is operating at full power with the following conditions:

- Steam Dump Mode Selector Switch and controller in "AUTO"
- Control rods in "MANUAL"
- Main turbine control valve 3464 failed closed
- Generator output reduced to 515 MW

Which one of the below statements describes the operation of the condenser steam dump valves?

A. Steam dump valves will not open because the arming signal will not actuate

B. Steam dump valves will open when the temperature error exceeds 4ºF and some valves will remain open

C. All steam dump valves will snap open initially, but then modulate closed to match Tavg with Tref

D. All steam dump valves will go full open and will remain full open until control rods are driven in to match Tavg with Tref

RO Question # 38

The plant has been tripped from 100% power due to a SGTR in SG 'A', concurrent with a loss of offsite power. The crew is responding to the event in E-3, SGTR.

Current conditions are:

- RCS pressure – 1600 psig
- SG 'A' – 950 psig
- SG 'B' – 800 psig

In preparation for the cooldown step, and using steam tables, which of the following is the approximate CET temperature associated with 20°F subcooling after the cooldown in response to the SG tube rupture in E-3?

A. 500 degrees

B. 520 degrees

C. 540 degrees

D. 560 degrees

RO Question # 39

Which one of the following conditions would prohibit full core offload to the SFP during refueling outage?

A. SFP temperature 49 degrees F

B. "B" Aux Bldg Exhaust fan is out of service for repairs

C. Aux Bldg crane interlock is by-passed to allow access to the Decon Pit

D. Fuel Transfer System Valve (Canal/Tube Isolation) light de-energized

RO Question # 40

Which one of the following explains why charging pump control is transferred to local during the performance of ER-FIRE.1, Alternate Shutdown For Control Complex Fire?

Local control -

A. prevents spurious operation of the “A” charging pump due to wire short or open during the fire

B. provides uninterrupted Instrument Air supply for speed control of “A” charging pump

C. allows for adjustment of “A” charging pump minimum speed by the I&C Tech to support RCS cooldown with loss of Instrument Air

D. allows the “A” charging pump to continue to run in case a spurious UV is initiated by the fire

RO Question # 41

- The plant is operating at 100% power when a Reactor Trip occurs.
- 5 seconds later, Tavg is 560°F and lowering.
- 15 seconds later (20 seconds after reactor trip) Tavg is 552 °F and lowering.

At 5 seconds after the reactor trip the Feed Regulating Valves (FRVs) will __(1)__; at 20 seconds after the reactor trip the FRVs will __(2)__ .

	(1)	(2)
A.	have a full closed signal	have a full closed signal
B.	have a full closed signal	be modulating to restore SG level
C.	be modulating to restore SG level	have a full closed signal
D.	be modulating to restore SG level	be modulating to restore SG level

RO Question # 42

Given the following MCB indications immediately after a large steam break:

- "A" SG pressure PI-468, 469, 482A: 200 psig and lowering
- "B" SG pressure PI-478, 479, 483A: 1050 psig and lowering
- Steam Header pressure PI-484: 100 psig and lowering
- "A" SG steam flow FI-464, 465, 498: 4.6×10^6 lbm/hr
- "B" SG steam flow FI-474, 475, 499: 0.1×10^6 lbm/hr
- Turbine 1st STG pressure PI-485, 486: 75 psig and lowering

All systems functioned as designed.
Which one of the following is the location of the steam break?

A. Between "A" SG and "A" SG flow element

B. Between the "A" SG flow element and "A" MSIV

C. Between the MSIVs and PI-484

D. Between the turbine stop valves and the HP turbine

RO Question # 43

Given the following:

- The crew is responding to a steam break.
- 'A' MDAFW pump is feeding 'A' SG at 200 gpm.
- The CRS has directed you to secure feed to the "A" SG.

As "A" MDAFW pump discharge valve closes, the recirc valve will open at __(1)__ discharge flow, so that the pump head stabilizes at __(2)__ the 200 gpm value.

A. (1) 100 gpm
(2) the same as

B. (1) 100 gpm
(2) a higher value than

C. (1) 80 gpm
(2) the same as

D. (1) 80 gpm
(2) a higher value than

RO Question # 44

Plant conditions are as follows:

- The reactor is critical and at 2% power.
- A containment entry is underway to look for a leak identified during the startup.
- The operator and RP tech who are looking for the leak have called the control room and informed you they have discovered a Boric Acid leak coming from the reactor cavity area and going into the 'A' sump.
- They have requested permission to enter the reactor cavity area and 'A' sump to determine the extent of the Boric Acid leak.
- The RP tech has the proper radiological and safety instrumentation necessary, and both individuals are wearing the proper dosimetry.

Which of the following is the correct personnel action regarding entry into the areas, in accordance with A-3, Containment Vessel Access Requirements? They may:

A. not enter either of the areas

B. enter the 'A' sump, but NOT the reactor cavity area

C. enter the reactor cavity area, but NOT the 'A' sump

D. enter BOTH areas provided that the RP tech remains with the operator at all times

RO Question # 45

Given the following plant conditions:

- The plant was at full power.
- Offsite power is in the 50/50 ALTERNATE alignment.
- Circuit 7T tripped.
- The associated DG started and achieved 8 psig jacket water pressure.

Which one of the following describes the status of the safeguard busses?

	(14/18 busses)	(16/17 busses)
A.	Powered by the DG	Powered by offsite power
B.	De-energized	Powered by offsite power
C.	Powered by offsite power	De-energized
D.	Powered by offsite power	Powered by the DG

RO Question # 46

The plant was at full power when Avg Tavg failed HIGH. The crew responded per the appropriate alarm response. Later a turbine trip occurred.

Which one of the following identifies how the steam dump system responds to this situation?

Steam dump valves will -

A. Snap open at 1060 psig

B. Initially snap open, and then modulate based on Avg Tavg signal and a fixed value of 547 degrees F

C. Modulate open to control steam header pressure at 1050 psig

D. Modulate open based on an error signal between steam header pressure and the controller setpoint

RO Question # 47

Given the following:

- The plant is at full power.
- Output voltage from Main DC Distribution Panel A failed (breaker failure)

Which one of the following describes: (1) The MCB annunciator response and (2) The operation of Static transfer switch A?

A. (1) E-3, INVERTER TROUBLE is received
(2) Must be manually transferred to the alternate supply transformer

B. (1) E-6, LOSS A INSTR BUS is received
(2) Must be manually transferred to the alternate supply transformer

C. (1) E-3, INVERTER TROUBLE is received.
(2) Automatically transfers to the alternate supply transformer

D. (1) E-6, LOSS A INSTR BUS is received
(2) Automatically transfers to the alternate supply transformer

RO Question # 48

Given the following plant conditions:

- The plant was at full power.
- A loss of all AC power has occurred.
- The crew is implementing the actions of ECA-0.0, Loss of All AC Power.
- The crew is concerned about the TDAFW pump oil cooler.

Per ATT-5.2, ATTACHMENT ALTERNATE COOLING TO TDAFW PUMP: (1) What are the two alternate methods of providing TDAFW pump oil cooler cooling, in the order established by the attachment, and (2) what is the basis for the established order of preference?

A. (1) Feed flow from the TDAFW pump's 1st stage, Fire Water
(2) the secondary alternate method depletes cooling source inventory

B. (1) Fire Water, Feed flow from the TDAFW pump's 1st stage
(2) the secondary alternate method depletes cooling source inventory

C. (1) Feed flow from the TDAFW pump's 1st stage, Fire Water
(2) the secondary alternate method reduces TDAFW pump capacity

D. (1) Fire Water, Feed flow from the TDAFW pump's 1st stage
(2) the secondary alternate method reduces TDAFW pump capacity

RO Question # 49

Given the following conditions:

- The plant is at 100% power.
- PT-429 is selected as the input to the Master Pressurizer Pressure controller.
- The Master Pressurizer Pressure controller develops a ground in its control circuitry.

Which one of the following identifies circuits that may be affected by this ground?

A. PRZR Proportional heaters operation and PRESSURIZER HI PRESSURE reactor trip logic

B. PRZR Pressure PI-429 indication and PRESSURIZER LO PRESS SI logic

C. PRZR Proportional heaters operation and PRZR Pressure PI-429 indication

D. PRESSURIZER HI PRESSURE reactor trip logic and PRESSURIZER LO PRESS SI logic

RO Question # 50

From which of the following conditions may the operator enter ES-0.0, Rediagnosis, based on operator judgment?

A. After the immediate operator actions of E-0, Reactor Trip or Safety Injection, have been completed

B. From ES-0.2, Natural Circulation Cooldown, procedure

C. From FR-P.1, Imminent PTS Condition, procedure

D. From E-2, Faulted SG Isolation, procedure

RO Question # 51

A loss of all AC power is in progress.

Which one of the following identifies (1) The proper order of expected MCB alarms as battery capacity is reduced, and (2) How a faster battery discharge rate is indicated on the 'A' and 'B' Battery Amps digital displays on the Control Room Isolation panel?

(J-21, 1A or 1B BATTERY UNDERVOLTAGE)
(J-31, VITAL BATTERY MONITORING SYSTEM)

A. (1) J-21 and then J-31;
(2) A larger positive (+) number

B. (1) J-31 and then J-21;
(2) A larger positive (+) number

C. (1) J-21 and then J-31;
(2) A larger negative (-) number

D. (1) J-31 and then J-21;
(2) A larger negative (-) number

RO Question # 52

Given that the plant is in Cold Shutdown, Mode 5, Loops Not Filled.

Which one of the following describes the intent of ER-RHR.1, RCDT Pump Operation For Core Cooling?

ER-RHR.1 provides guidance to align the RCDT pumps for core cooling in the event -

A. RCS pressure stabilizes above RHR pump shutoff head during a small break LOCA

B. RHR pumps are lost when operating at RCS reduced inventory conditions

C. a secondary heat sink cannot be established following the loss of all AFW

D. CNMT sump B level is not adequate to provide NPSH for RHR pumps

RO Question # 53

While operating at power, bus 14 tripped on overcurrent, resulting in A EDG running unloaded. Subsequently, a loss of offsite power occurred and the B EDG started.

Which one of the following is correct regarding the DGs and their fuel oil transfer pumps (FOTP) for these conditions?

__(1)__ fuel oil transfer pump has power available. With an AO stationed locally, this FOTP can supply __(2)__ EDG(s).

	(1)	(2)
A.	A	BOTH
B.	A	ONLY A
C.	B	BOTH
D.	B	ONLY B

RO Question # 54

Given the following plant conditions:

- There is a tube rupture in the 'B' S/G
- The crew is performing actions to isolate the ruptured steam generator per E-3, STEAM GENERATOR TUBE RUPTURE
- 'A' S/G MSIV is closed

Which one of the following actions should be performed to stop/reduce the radioactive release in progress, per the Major Action Category isolation steps of E-3?

A. Manually open the 'A' S/G ARV to maintain RCS temperature

B. Adjust 'B' S/G ARV controller to 1050 psig in auto

C. Shut the manual isolation valve for 'B' S/G ARV

D. Place the 'B' S/G ARV controller in manual at 0% demand

RO Question # 55

The plant is at 100% power with the following conditions:

- RMS channel R-17, Component Cooling Water, drawer display initially read 2.1E03 cpm, then rose rapidly to >1E06, and now reads "EEEEE"
- R-17 drawer WARN and HIGH lights are lit
- 40 gpm letdown orifice valve AOV-200B is in service
- PCV-135, letdown pressure control valve, is 40% open
- Both RCP labyrinth seal D/Ps are 40"

Which of the following (1) indicates the reason for these indications and (2) what procedure(s) would be entered in response to these indications?

A. (1) Detector failure
(2) STP-O-17.2, RAD MONITORS R-11 thru R-18 SOURCE CHECK, ALARM SETPOINT VERIFICATION, AND FUNCTIONAL TEST

B. (1) Detector failure
(2) E-16, RMS PROCESS MONITOR HIGH ACTIVITY

C. (1) RCS in-leakage to CCW system
(2) E-16, RMS PROCESS MONITOR HIGH ACTIVITY

D. (1) RCS in-leakage to CCW system
(2) AP-CCW.1, Leakage Into the CCW Loop

RO Question # 56

The crew is restoring power to Instrument Bus D while implementing FR-S.1, Response To Reactor Restart/ATWS.

Which one of the following identifies: (1) Where Instrument Bus D will be powered from, and (2) What the basis is for restoring Instrument Bus D?

A. (1) MCC A or MCC B;
   (2) Power the Intermediate Range SUR instrumentation

B. (1) MCC A or MCC B;
   (2) Power the Radiation Monitoring instrumentation

C. (1) MCC A or MCC C;
   (2) Power the Intermediate Range SUR instrumentation

D. (1) MCC A or MCC C;
   (2) Power the Radiation Monitoring instrumentation

RO Question # 57

Given the following:

- The plant is operating at full power, MOL
- There's a Service Water leak on the weld for TE-6875, Containment Recirc Fan 'A' Motor Cooler Outlet temperature.

Which one of the following accident scenarios could result in a radiation alarm on R-16, CNMT Service Water Radiation Monitor? Assume the CNMT pressure values are not related to the existing SW leak.

A. LOCA with RCS I-131 activity 30μCi/gm and resultant CNMT pressure stable at 58 psig

B. LOCA with RCS I-131 activity 80μCi/gm and resultant CNMT pressure stable at 6 psig

C. MSLB inside CNMT on 'B' S/G with SGTR on 'A' S/G; RCS activity 80μCi/gm and resultant CNMT pressure stable at 6 psig

D. MSLB inside CNMT on 'B' S/G with SGTR on 'A' S/G; RCS activity 30μCi/gm and resultant CNMT pressure stable at 58 psig

RO Question # 58

Given the following conditions:

- Offsite power has been lost
- Both D/Gs started and re-energized the emergency busses
- Service water pumps A, B, and C are NOT running.
- Attempts to start service water pumps A, B, and C were unsuccessful
- Service water pump D is running

Which of the following describes the action(s) required per AP-SW.2, Loss of Service Water?

A. Pull-stop ED/G 'A' and immediately depress the voltage shutdown pushbutton. Do not stop ED/G 'B.'

B. Pull-stop ED/G 'B' and immediately depress the voltage shutdown pushbutton. Do not stop ED/G 'A.'

C. Pull-stop both ED/Gs, immediately depress their voltage shutdown pushbuttons, and go to ECA-0.0. Loss of All AC Power.

D. Trip the reactor, perform the immediate actions of E-0, Reactor Trip or Safety Injection, then trip all RCPs.

RO Question # 59

Given the following:

- The plant was initially at full power.
- A turbine load reduction equivalent to 50% of rated thermal power at a rate 200% per minute occurred.
- Condenser steam dumps operated properly.
- Automatic rod control was available.

Which one of the following identifies the pressurizer design basis associated with this transient?

A. If PRZR level is 56% at the start of the transient, the RCS pressure rise will be controlled by the PRZR Safeties

B. If PRZR level is 56% at the start of the transient, the PRZR vapor space will remain large enough to maintain pressure throughout the transient

C. The PRESSURIZER HI PRESSURE reactor trip ensures the RCS pressure rise will be controlled by the PRZR Safeties

D. The PRESSURIZER HI PRESSURE reactor trip ensures the PRZR vapor space will remain large enough to maintain pressure throughout the transient

RO Question # 60

Following a large break LOCA, the operators are in E-1, Loss of Reactor or Secondary Coolant. The HCO notes that CNMT sump B level indication for 180 inches is illuminated for both trains.

Which one of the following statements is correct regarding the sump level?

A. This indicates the swapover to cold leg recirculation has not occurred. The operators should transition to ES-1.3, Cold Leg Recirculation, and initiate recirculation.

B. This indicates service water leakage into CNMT. The operators will take action per AP-SW.1, Service Water Leak.

C. This indicates unexpected water entering into CNMT. The operators will take action per FR-Z.2, Response to Containment Flooding.

D. This indicates unexpected water entering into CNMT. The operators will monitor level, but take no action until level > 214 inches in sump B.

RO Question # 61

The unit is at cold shutdown. The following conditions exist:

- The 'C' Instrument Air Compressor and Service Air Compressor are OOS.
- 'A' and 'B' Instrument Air Compressors are running with local control in 'Constant Speed'
- The Diesel Air Compressor is aligned to service air per T-2F, "Backup Air Supply"

Subsequently the following occurs:

- 'B' Instrument Air Compressor trips
- Instrument air header pressure is 105 psig and slowly lowering.

Assuming no operator action, which one of the following describes the Instrument and Service Air system response?

A. The 'A' instrument air compressor will load at 90 psig and control instrument air header pressure between load and unload setpoints

B. The 'A' instrument air compressor will load at 100 psig and control instrument air header pressure between load and unload setpoints

C. AOV-5251, Service Air Crosstie Valve will open at 90 psig and supply the instrument air header with backup air

D. AOV-5251, Service Air Crosstie Valve will open at 100 psig and supply the instrument air header with backup air

RO Question # 62

Given the following conditions:

- A small break LOCA has occurred outside containment
- Actions of ECA-1.2, LOCA Outside Containment, have failed to isolate the break
- RCS pressure is 1440 psig and continues to lower
- PRZR level is 0%
- RWST level is 84% and slowly lowering

Which one of the following identifies: (1) The procedure that will be used upon transition from ECA-1.2, and (2) The basis for the transition?

A. (1) FR-I.2, Response to Low Pressurizer Level
(2) To raise SI flow and RCS inventory

B. (1) E-1, Loss of Reactor Or Secondary Coolant
(2) To continue actions to address the LOCA

C. (1) ES-1.2, Post LOCA Cooldown And Depressurization
(2) To reduce SI flow and conserve makeup inventory

D. (1) ECA-1.1, Loss of Emergency Coolant Recirculation
(2) To address the loss of inventory available for core cooling

RO Question # 63

Given the following:

- A plant startup is in progress with power at 5%
- Operators are NOT aware that the UV trip coil for RTB "A" is jammed in its current position and will not function if called upon

If an automatic zirconium guide tube trip signal occurs, then in order to open <u>BOTH</u> RTBs, the operator __(1)__, because __(2)__ .

A. (1) Must depress either the manual reactor trip pushbutton or the local 'A' RTB trip button
   (2) "A" RTB will still be closed

B. (1) Must depress the manual reactor trip pushbutton; local RTB trip button will not function
   (2) "A" RTB will still be closed

C. (1) Will not have to take any further actions
   (2) <u>only</u> the shunt coil opened "A" RTB and <u>only</u> the UV coil opened "B" RTB

D. (1) Will not have to take any further actions
   (2) <u>only</u> the shunt coil opened "A" RTB and <u>both</u> the shunt and UV coils opened "B" RTB

RO Question # 64

Given the following conditions:

- The plant is at 100% power
- A Containment entry is in progress

Which one of the conditions listed below requires the containment to be evacuated?

A. Unexpected R-11, CNMT Vent Particulate, alarm

B. Radio communications with the Control Room becomes unavailable.

C. Swapping Containment Recirc Fans is required

D. Upon entry, it is discovered that area lighting is OFF in the intermediate and basement levels

RO Question # 65

Given the following:

- The plant is in mode 6 with fuel movement in progress
- The CNMT Purge System is in service.
- Annunciator L-4, Safeguard DC Failure CI and CVI Logic, alarmed
- The secondary AO reports the "Safeguards DC Failure CI and CVI Logic" lights on SIA1 and SIB1 racks are de-energized

Which ONE of the following explains: (1) The effect this will have on CI and CVI, and (2) Any applicable ITS action?

A. (1) "A" and "B" train Auto and Manual CI and CVI are disabled.
   (2) Per LCO 3.6.3, Containment Isolation Boundaries, immediately isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve or closed manual valve

B. (1) "A" and "B" train Auto and Manual CI and CVI are disabled.
   (2) Per LCO 3.9.3, Containment Penetration, immediately suspend core alterations and movement of irradiated fuel assemblies within containment

C. (1) "A" and "B" train Auto CI and CVI are disabled. Manual CI and CVI remain available.
   (2) Per LCO 3.6.3, Containment Isolation Boundaries, immediately isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve or closed manual valve

D. (1) "A" and "B" train Auto CI and CVI are disabled. Manual CI and CVI remain available.
   (2) Per LCO 3.9.3, Containment Penetration, immediately suspend core alterations and movement of irradiated fuel assemblies within containment

RO Question # 66

The plant was operating at power, when a valid SI signal was received. SI pumps have been secured per the EOP guidance in effect.

Which one of the following describes the proper operation of the secured SI Pumps, if an FR procedure is in progress when the SI Reinitiation criteria of the EOP procedure FOLDOUT page are met?

A. Manually operate SI pumps as necessary if in a yellow, orange, or red path FR.

B. Do not operate the SI pumps, continuous actions on FOLDOUT pages do not apply when in FR procedures.

C. Manually operate SI pumps as necessary if in a yellow or orange FR, but only as directed if in a red path FR.

D. Manually operate SI pumps as necessary if in a yellow path FR, but only as directed if in a red or orange path FR.

RO Question # 67

During performance of ATT-27.0, Attachment Automatic Action Verification, it was recognized that the CHRC FLTR 1A DAMPERS CLOSED status light was lit, and the CHRC FLTR 1C DAMPERS CLOSED status light was extinguished.

The __(1)__ charcoal filter damper is improperly aligned, and this will be corrected by pushing in trip relay plungers in the Relay Room __(2)__ Rack.

	(1)	(2)
A.	1A	RLTR-1
B.	1A	RA-2
C.	1C	RLTR-2
D.	1C	RA-3

RO Question # 68

A NOTE prior to the second SG depressurization step (36) in ECA-1.1, Loss of Emergency Coolant Recirculation, states "The intent of the next step is to depressurize the SGs more slowly, but at a rate that will maintain required RVLIS level."

Which one of the following statements gives the reason for slowly depressurizing the SGs?

A. To prevent accumulator nitrogen from entering the RCS and causing gas binding

B. To avoid exceeding the Tech Spec cooldown or depressurization limit

C. To allow time for the vessel head to cool by ambient losses to minimize the potential for void formation

D. To minimize the rate of accumulator water injection, extending the time for depletion of the accumulator inventory

RO Question # 69

Given the following conditions:

- The plant is in Mode 5
- Containment Purge is in progress with Train 'B' in service
- Containment personnel are ready to install the equipment hatch

Subsequently, the Control Room has been directed to swap the running Containment Purge trains (Secure 'B' Train and start 'A' Train).

Which one of the following describes: (1) IF the Containment Purge System may remain in-service during the equipment hatch installation; and (2) per the applicable procedure, the action taken prior to starting the 'A' Train of Containment Purge to ensure that 'A' exhaust fan starts, but 'A' supply fan remains secured?

A. (1) Yes
(2) Ensure the 'A' Containment Purge Supply Fan breaker on MCC-A is open

B. (1) Yes
(2) Place the control switch at the 'A' Purge Supply Fan breaker in the SECURE position

C. (1) No
(2) Ensure the 'A' Containment Purge Supply Fan breaker on MCC-A is open

D. (1) No
(2) Place the control switch at the 'A' Purge Supply Fan breaker in the SECURE position

RO Question # 70

Which one of the following is true regarding ADVERSE containment values relating to radiation?

A. Adverse values should not be used until either R-29 or R-30 exceeds 10^6 R/hr

B. Adverse values should not be used until both R-29 and R-30 exceed 10^6 R/hr

C. Return to NORMAL values should be used when CNMT pressure is <4 psig and the integrated radiation dose is verified to be less than 10^6 R/hr

D. Return to NORMAL values should be used when CNMT pressure is <4 psig or the integrated radiation dose is verified to be less than 10^6 R/hr

RO Question # 71

While performing Step 2 of ECA-0.0, "Loss of All AC Power", the STA informs you that he has received an orange path on core cooling, and a red path on integrity.

Which one of the following states the correct action to take?

A. Continue with ECA-0.0 while monitoring CSFSTs

B. Continue with ECA-0.0 but do not monitor CSFSTs until directed later in ECA-0.0

C. Immediately transition to FR-C.1, "Response to Inadequate Core Cooling"

D. Immediately transition to FR-P.1 "Response to Imminent Pressurized Thermal Shock"

RO Question # 72

Step 2 of FR-H.1, Response to Loss of Secondary Heat Sink, checks both S/G wide range levels less than 120 inches [160 inches adverse CNMT]. If the S/G wide range levels are less than the stated levels, the step directs stopping both RCPs and going to step 13, which initiates RCS bleed and feed.

Which one of the following is the reason an immediate bleed and feed is initiated under these conditions?

A. If bleed and feed is delayed, higher CET temperatures will increase the likelihood of core damage when SI flow is initiated

B. If bleed and feed is delayed PORV's may not remove enough energy to depressurize RCS to less than SI pump shutoff head

C. This ensures sufficient mass exists in the S/Gs to ensure complete dryout of the S/G does not occur during the design basis event duration

D. This ensures sufficient mass exists in the S/Gs to ensure that thermal stress is reduced on the subsequent reinitiation of feed

RO Question # 73

Given the following conditions during the performance of ES-0.3, Natural Circulation Cooldown with Steam Void in Vessel:

- There is a steam void in the reactor vessel head
- RCS cooldown and depressurization is in progress
- RVLIS level is currently 83% and slowly lowering as the depressurization progresses

Which one of the following explains (1) the concern for the procedural limit of 81% RVLIS level and (2) how will RVLIS level be raised?

A. (1) RVLIS level and Subcooling are used for SI reinitiation criteria
(2) Energize PRZR heaters

B. (1) RVLIS level and Subcooling are used for SI reinitiation criteria
(2) Raise Letdown flow to lower PRZR level and shift more water inventory into the reactor vessel

C. (1) RVLIS level is used to ensure continuation of natural circulation flow
(2) Energize PRZR heaters

D. (1) RVLIS level is used to ensure continuation of natural circulation flow
(2) Raise Letdown flow to lower PRZR level and shift more water inventory into the reactor vessel

RO Question # 74

V-5106, Service Air Pressure Control Valve to Fire Water Storage Tank, was inadvertently isolated.

Which one of the following: 1) Explains why annunciator AR-K-31, Fire System Alarm Panel, will energize, and 2) Identifies the first automatic pump start that will occur as Fire Storage Tank pressure lowers?

A. 1) Fire Booster Pump start
2) At 105 psig the Fire Water Booster Pump will start

B. 1) Fire Booster Pump start
2) At 100 psig the Fire Water Booster Pump will start

C. 1) Motor Fire Pump start
2) At 95 psig the Motor Driven Fire Pump will start

D. 1) Motor Fire Pump start
2) At 85 psig the Motor Driven Fire Pump will start

RO Question # 75

The unit is operating at 18% power when the following event occurs:

Frequency on Bus 11A and 11B lowers to 55 HZ.

Which of the following would be the expected positions for the RCP breakers and the Reactor trip breakers?

	RCP Breakers	Reactor Trip Breakers
A.	Open	Open
B.	Open	Shut
C.	Shut	Shut
D.	Shut	Open

SRO Question # 76

Given the following:

- A small break LOCA is in progress.
- Upon initiation of the SI, only the "C" SIP started ("A" and "B" SIPs could not be started manually).
- The team is performing ES-1.2, Post LOCA Cooldown and Depressurization.
- The team has just initiated an RCS cooldown per step 8.
- Current plant conditions include:
  - FI-177, HI RNG RCP A SEAL LEAKOFF: 9.2 gpm
  - TI-132, RCP 1A SEAL WTR INLET TEMP: 105^{O}F and rising
  - TI-181, RCP 1A SEAL WTR OUTLET TEMP: 180^{O}F and rising

Which one of the following is correct regarding continued operation of "A" RCP?

A. Immediately trip the "A" RCP per AP-RCP.1 criteria.

B. Secure the "A" RCP within 8 hours per AP-RCP.1 criteria.

C. Continue to ES-1.2 step 12 which applies EOP guidance to stop all but one RCP. Trip the "A" RCP.

D. RCP trip criteria do not apply following initiation of an operator controlled RCS cooldown. Do NOT trip "A" RCP.

SRO Question # 77

Given the following:

- The plant was operating at full power when PORV-431C failed open and could not be isolated.
- Upon reactor trip, a loss of offsite power occurred.
- The team is performing ES-1.2, Post LOCA Cooldown and Depressurization.
- As CRS, you have read the caution regarding subcooling and transition to FR-P Integrity procedures.
- The team has just established an RCS cooldown at a rate of 90°F/HR per step 8
- Current plant conditions include:

    - RCS pressure: 800 psig
    - Core Exit T/C 499 °F
    - CNMT pressure 14 psig

- The STA has just announced that Safety Parameter Display System (SPDS) indicates an orange path on INTEGRITY.

The STA must verify the condition of all CSFSTs using __(1)__ . The correct procedural use in this situation is to __(2)__ .

A. (1) Control Room Panel indications
(2) Continue in ES-1.2 until RHR injection and then transition to FR-P.1

B. (1) Control Room Panel indications
(2) Immediately transition to FR-P.1

C. (1) Plant Process Computer System indications
(2) Continue in ES-1.2 until RHR injection and then transition to FR-P.1

D. (1) Plant Process Computer System indications
(2) Immediately transition to FR-P.1

SRO Question # 78

Given the following plant conditions:

- The plant is at full power.
- Pressurizer spray valve, PCV-431A, drifted partially open and then became mechanically stuck.
- All available pressurizer heaters are energized, but RCS pressure continues to lower.
- Lowering pressure results in an automatic reactor trip.

Which one of the following (1) identifies the proper procedure used to mitigate the consequences of this malfunction and (2) predicts whether or not the failure will result in SI flow if NO operator actions are taken.

A. (1) A-503.1, Emergency and Abnormal Procedures Users Guide
(2) SI will NOT flow

B. (1) E-0, Reactor Trip or Safety Injection
(2) SI will NOT flow

C. (1) A-503.1, Emergency and Abnormal Procedures Users Guide
(2) SI will flow

D. (1) E-0, Reactor Trip or Safety Injection
(2) SI will flow

SRO Question # 79

During the performance of an EOP, the Shift Manager in the control room thinks that a procedural deviation is required. Per A-503.1, Emergency and Abnormal Operating Procedures Users Guide, a procedure deviation should only be considered when three conditions are met.

Which one of the following is one of the three required conditions per A-503.1?

A. A second licensed SRO has approved the deviation

B. Insufficient time exists to implement the normal procedure change policy

C. The Manager – Operations or General Supervisor – Shift Operations is notified prior to initiating the deviation

D. The proposed alternative course of action will allow operation within the license condition or applicable Technical Specification

SRO Question # 80

During 100% power operations a small fire occurs in the Control Room kitchen. Large quantities of smoke fill the Control Room forcing the operating crew to evacuate.

Assuming the fire is controlled and extinguished in the kitchen area, 1) Which one of the following procedures will the operating crew utilize to establish the proper RCS boron concentration, and 2) What mode will the plant be in at endpoint of this procedure?

A. 1) ER-FIRE.1, Alternate Shutdown for Control Complex Fire;
2) MODE 5

B. 1) ER-FIRE.1, Alternate Shutdown for Control Complex Fire;
2) MODE 3

C. 1) AP-CR.1, Control Room Evacuation;
2) MODE 5

D. 1) AP-CR.1, Control Room Evacuation;
2) MODE 3

SRO Question # 81

The plant was at 100% power when the following conditions occurred:

- 'A' and 'C' charging pumps are running
- 'B' charging pump is out of service for maintenance
- A-4, REGEN HX LETDOWN OUT HI TEMP 395ºF, is received
- The crew initially entered AP-CVCS.1, CVCS Leak
- AO reports the relief valves on the running charging pumps are lifting
- Charging flow indicator FI-128 has been steadily lowering and now reads 0 gpm
- F-4, PRESSURIZER LEVEL DEVIATION -5 NORMAL +5, is received
- PRZR level is slowly lowering

Which one of the following will (1) provide the procedure used to provide mitigating actions and (2) describes the final reactor shutdown, RCS temperature and pressure conditions (disregard any long-term recovery actions)?

A. (1) AP-CVCS.3, Loss of All Charging Flow
(2) Tavg ~547ºF, RCS pressure ~2235 psig

B. (1) AP-CVCS.3, Loss of All Charging Flow
(2) Tcold ~535ºF, RCS pressure ~1400 psig

C. (1) AP-RCS.1, Reactor Coolant Leak
(2) Tavg ~547ºF, RCS pressure ~2235 psig

D. (1) AP-RCS.1, Reactor Coolant Leak
(2) Tcold ~455ºF, RCS pressure ~1400 psig

SRO Question # 82

Given the following:

- The unit is at 100% power
- A temporary sump pump is being installed in the Screenhouse in direct support of normally scheduled maintenance replacement of the Screenhouse Circ Water Bay sump pumps
- The replacement will be performed under a Work Order and a Temporary Change Package (TCP), and is expected to take less than 60 days.

For the given situation:
(1) Whose approval is required for this temporary change installation in the plant, and
(2) Will a 10CFR50.59 screening be required for this activity?

A. (1) Shift Manager (SM);
(2) 10CFR50.59 screening is NOT required

B. (1) Shift Manager (SM);
(2) 10CFR50.59 screening IS required

C. (1) Installation group supervisor;
(2) 10CFR50.59 screening is NOT required

D. (1) Installation group supervisor;
(2) 10CFR50.59 screening IS required

SRO Question # 83

Given the following conditions:

- A valid reactor trip signal occurred with the plant at full power.
- The reactor would not trip and the team transitioned to the appropriate emergency procedure.
- Emergency boration was initiated without an SI signal present.
- Subsequently, an automatic SI signal was received and the reactor is still not tripped.

Which one of the following explains (1) the status of emergency boration and (2) what actions are required?

A. (1) Boration flow is unaffected
(2) In FR-S.1, Response to Reactor Restart/ATWS, boration should continue to obtain adequate shutdown margin

B. (1) Boration flow is unaffected
(2) E-0, Reactor Trip or Safety Injection, requires a manual SI and manual CI; receipt of a subsequent auto SI signal will have no effect

C. (1) Boration flow is affected
(2) Initiate emergency boration flow per E-0, Reactor Trip or Safety Injection

D. (1) Boration flow is affected
(2) If SI flow is not indicated, the emergency boration step must be re-performed per FR-S.1

SRO Question # 84

At 0800, the plant is at 100% power generating 582 net MW.
Manual EHC control is not available.

At 0830, the RG&E Energy Control Center (ECC) notifies the control room:

- Station 13A Transmission Circuits have tripped
- Grid conditions require a net electric generating restriction of 256 MW within 14 minutes and 145 MW within 29 minutes

The crew begins a power reduction at 4% per minute.
At 0844, the net generation is at 270 MWe net.

Which one of the following describes the required action?

A. Trip the reactor and go to E-0, Reactor Trip or Safety Injection

B. Maintain the current load reduction rate to ensure the 29 minute limit is met

C. Lower VARs to lower generator output current and allow continued operation

D. Trip the turbine and go to AP-TURB.1, Turbine Trip Without Reactor Trip Required

SRO Question # 85

Given the following plant conditions:

- The plant was in MODE 5 with containment doors open to allow workers to move scaffolding.
- SG nozzle dam installation was in progress in preparation for SG inspection, when the running RHR pump tripped.
- The standby RHR pump would not start.

From the procedures below, which one of the following identifies the procedure(s) to use to respond to the situation?

- AP-RHR.1, Loss Of RHR
- AP-RHR.2, Loss Of RHR While Operating At Reduced Inventory Conditions
- O-1.1B, Establishing Containment Integrity
- O-2.3.1A, Containment Closure Capability Within Two Hours During Reduced Inventory Operation

A. AP-RHR.1 ONLY

B. AP-RHR.1, and O-1.1B

C. AP-RHR.2 ONLY

D. AP-RHR.2, and O-2.3.1A

SRO Question # 86

Given the following conditions:

- The plant is in a 100/0 electrical lineup on Circuit 767.
- The RG&E Energy Control Center has informed Ginna that the Post-Contingency Low Voltage Alarm (PCLVA) is INOPERABLE.
- The crew is monitoring Attachments 2 thru 6 of O-6.9, Ginna Station Operating Limits for Station 13A Transmission.
- The Operability limits of the attachments CANNOT be maintained

Which one of the following describes the consequences of this condition on the 480V Safeguards busses? Bus voltage will __(1)__ and the crew should __(2)__.

A. (1) remain above the undervoltage setpoint on a contingent loss of offsite power
(2) enter AP-ELEC.2, Safeguard Busses Low Voltage or System Abnormal Frequency and monitor voltage

B. (1) remain above the undervoltage setpoint on a contingent loss of offsite power
(2) per O-6.9, declare offsite power inoperable

C. (1) experience undervoltage condition on a contingent main generator trip
(2) enter AP-ELEC.2, Safeguard Busses Low Voltage or System Abnormal Frequency and monitor voltage

D. (1) experience undervoltage condition on a contingent main generator trip
(2) per O-6.9, declare offsite power inoperable

SRO Question # 87

Under what conditions would transition to E-2, Faulted Steam Generator Isolation, be made from procedure ECA-2.1, Uncontrolled Depressurization Of Both Steam Generators?

A. If an uncontrolled level rise in any S/G occurs

B. If any steam generator pressure rises at any time

C. If any steam generator pressure rises at any time (except while performing SI termination in steps 17 and 18)

D. If RCS pressure is NOT greater than 300 psig [350 psig adverse CNMT]

SRO Question # 88

Given the following conditions:

- The plant was in mode 5
- Workers are bringing outage equipment into containment through the equipment hatch
- The portable CAM outside the equipment hatch alarmed
- The RP Tech reported that there was *outward* air flow through the equipment hatch

Which one of the following identifies: (1) Guidance which provides the combinations of Purge fans used to establish a negative pressure in containment, and (2) Per that guidance, which acceptable fan combination will result in INWARD air flow through the equipment hatch?

A. (1) S-23.2.2, Containment Purge Procedure;
   (2) 2 Purge Exhaust Fans and 1 Purge Supply Fan running

B. (1) S-23.2.2, Containment Purge Procedure;
   (2) 2 Purge Exhaust Fans and no Purge Supply Fan running

C. (1) AR-C-17, CNMT VENT SYSTEM;
   (2) 2 Purge Exhaust Fans and 1 Purge Supply Fan running

D. (1) AR-C-17, CNMT VENT SYSTEM;
   (2) 2 Purge Exhaust Fans and no Purge Supply Fan running

SRO Question # 89

Given the following conditions:

- A Site Area Emergency is in progress
- An operator has been determined to be missing, and his last known location was the Auxiliary Building Sub-basement
- The radiation levels in the Auxiliary Building Sub-basement are expected to be very high
- It's assumed that the operator is injured

(1) What is the radiation exposure limit for the search and removal of the operator, and
(2) What procedure provides the limit for this situation?

A. (1) 10 Rem;
(2) EPIP-2.8, Voluntary Acceptance Of Emergency Radiation Exposure

B. (1) 10 Rem;
(2) A-1, Radiation Control Manual

C. (1) 25 Rem;
(2) EPIP-2.8, Voluntary Acceptance Of Emergency Radiation Exposure

D. (1) 25 Rem;
(2) A-1, Radiation Control Manual

SRO Question # 90

A LOCA was in progress with the following plant conditions:

• CNMT pressure	16 psig and rising
• Average CETs	1214 °F
• RCS pressure	1000 psig
• RWST level	74%
• RVLIS	60%
• S/G narrow range levels	30%

The CRS entered the appropriate procedure. During the performance of that procedure he reaches the step that requires the S/Gs to be depressurized from 160 psig to atmospheric pressure.

Which one of the following identifies the procedure the CRS entered, and an action that must be performed immediately before the subsequent S/G depressurization?

A. FR-C.2, Response To Degraded Core Cooling; Stop the RCPs

B. FR-C.1, Response To Inadequate Core Cooling; Stop the RCPs

C. FR-C.2, Response To Degraded Core Cooling; Check SI accumulator discharge valves open

D. FR-C.1, Response To Inadequate Core Cooling; Check SI accumulator discharge valves open

SRO Question # 91

The plant is cooling down per O-2.2, Plant Shutdown From Hot Shutdown To Cold Conditions, with the following conditions:

- RCS temperature is 295 ºF and lowering
- 'A' CNMT Recirc Fan trips on an apparent overcurrent condition
- Shortly thereafter, a loss of all offsite power occurs
- 'A' D/G trips upon start
- 'B' RHR pump will not start
- An AO is directed to perform ER-DG.1, Restoring D/Gs, for 'A' DG
- The AO reports that he is unable to start 'A' D/G. The next step in his procedure directs the performance of Control Room actions prior to contacting Mechanics and Electricians.

Which one of the following choices describes actions (1) that would be taken per ER-D/G.1; and (2) that will be performed to cool the RCS if current conditions cannot be mitigated.

A. (1) Do NOT initiate SI. Depress the Overcurrent RESET pushbutton (inside MCB).
(2) Use C SBAFW pump to feed 'A' S/G per Attachment C, SBAFW PUMP RESTORATION, and dump steam.

B. (1) Do NOT initiate SI. Depress the Overcurrent RESET pushbutton (inside MCB).
(2) Verify natural circulation. If natural circulation not verified, raise dumping steam.

C. (1) Initiate SI and depress 'A' D/G RESET pushbutton;
(2) Use C SBAFW pump to feed 'A' S/G per Attachment C, SBAFW PUMP RESTORATION, and dump steam.

D. (1) Initiate SI and depress 'A' D/G RESET pushbutton;
(2) Verify natural circulation. If natural circulation not verified, raise dumping steam.

SRO Question # 92

The “A” Monitor Tank was sampled at 1700 on Monday and the analysis was completed for subsequent release. An event occurred that is delaying the initiation of the release.

Considering the four times listed below, which of the choices identifies ALL of the times at which the release could be initiated with no restrictions?

1) 1900 Monday

2) 2300 Monday

3) 0400 Tuesday

4) 1700 Tuesday

A. 1 ONLY

B. 1, 2 ONLY

C. 1, 2, 3 ONLY

D. 1, 2, 3, 4

SRO Question # 93

Following a loss of all AC power, the following conditions exist:

- S/G A pressure - 615 psig and steady
- S/G B pressure - 623 psig and steady
- RCS Loop A Cold Leg – 491 °F
- RCS Loop B Cold Leg – 493 °F
- RCS Loop A Hot Leg – 510 °F and steady
- RCS Loop B Hot Leg – 511 °F and steady
- Core exit TCs – 515 °F and steady
- RCS pressure - 1200 psig
- PRZR level – 14%
- Containment pressure - 1.0 psig
- Containment radiation - 3.61 mR/hr

The crew is preparing to implement the actions of Step 20 of ECA-0.0, to depressurize SGs, when power is restored to a safeguard bus. Which one of the following states (1) the next recovery procedure you transition to, and (2) why natural circulation is/is not indicated?

A. (1) ECA-0.1, Loss Of All AC Power Recovery Without SI Required;
(2) Natural circulation is indicated. RCS cold leg temperature is at SG saturation temperature for observed SG pressure.

B. (1) ECA-0.1, Loss Of All AC Power Recovery Without SI Required;
(2) Natural circulation is not indicated. The RCS is not subcooled.

C. (1) ECA-0.2, Loss Of All AC Power Recovery With SI Required;
(2) Natural circulation is indicated. RCS cold leg temperature is at SG saturation temperature for observed SG pressure.

D. (1) ECA-0.2, Loss Of All AC Power Recovery With SI Required;
(2) Natural circulation is not indicated. The RCS is not subcooled.

SRO Question # 94

Given the following plant conditions:

- A SGTR is in progress
- The cooldown to establish subcooling has been completed
- PORV-430 was opened to minimize break flow and refill the PRZR
- When the criteria to close PORV-430 was met, both PORV-430 and MOV-516 would not close

Following the required procedure transition, the CRS eventually reached the following CAUTION:

FEED FLOW SHOULD NOT BE ESTABLISHED TO ANY RUPTURED S/G WHICH IS ALSO FAULTED UNLESS IT IS NEEDED FOR RCS COOLDOWN.

Which one of the following identifies:
(1) The procedure that the CRS transitioned to, and
(2) The basis for the caution?

A. (1) ECA-3.1, SGTR With Loss Of Reactor Coolant – Subcooled Recovery Desired
(2) Prevent exacerbating the RCS cooldown by feeding a faulted steam generator

B. (1) ECA-3.1, SGTR With Loss Of Reactor Coolant – Subcooled Recovery Desired
(2) Minimize the potential for thermal shock of the S/G tubes

C. (1) ECA-3.3, SGTR Without Pressurizer Pressure Control
(2) Prevent exacerbating the RCS cooldown by feeding a faulted steam generator

D. (1) ECA-3.3, SGTR Without Pressurizer Pressure Control
(2) Minimize the potential for thermal shock of the S/G tubes

SRO Question # 95

Technical Specification 3.4.16 places a limit on maximum RCS gross specific activity. If this limit is exceeded, RCS Tavg must be reduced to less than __(1)__ °F within 8 hours. The basis of the temperature reduction is to __(2)__ .

	(1)	(2)
A.	540	Protect the public against the potential radioactive release from a steam generator tube rupture
B.	540	Limit the radiological consequences of a DBA LOCA
C.	500	Protect the public against the potential radioactive release from a steam generator tube rupture
D.	500	Limit the radiological consequences of a DBA LOCA

SRO Question # 96

Which one of the following identifies:
(1) A possible result of calibration drift of R-47, Air Ejector Monitor, and
(2) The appropriate procedure(s) from those listed below to address this condition?

(NOTE:
- STP-O-17.5M, Source Check of High Range Effluent Monitors RM-12A, RM14A, R-31, R-32, R-47, R-48;
- ITS 3.4.15, RCS Leakage Detection Instrumentation)

A. (1) High Voltage reading being outside its limit compared to the Tape Value posted on the drawer;
(2) STP-O-17.5M, and ITS 3.4.15

B. (1) High Voltage reading being outside its limit compared to the Tape Value posted on the drawer;
(2) STP-O-17.5M

C. (1) Warning Alarm and High Alarm setpoints below their required values;
(2) STP-O-17.5M, and ITS 3.4.15

D. (1) Warning Alarm and High Alarm setpoints below their required values;
(2) STP-O-17.5M

SRO Question # 97

The plant has experienced a loss of vital DC Bus A.

Bus 11A control power __(1)__ automatically transfer to DC Bus B; and __(2)__ will identify the equipment affected when specific DC breakers are de-energized.

(P-11, Electrical Distribution Panel Reference Manual Main Control Board DC,
P-12, Electrical Systems Precautions, Limitations, And Setpoints)

	(1)	(2)
A.	will	P-11
B.	will	P-12
C.	will not	P-11
D.	will not	P-12

SRO Question # 98

The plant was at full power. The crew implemented AP-RCS.1, Reactor Coolant Leak, to respond to an RCS leak. The time is 1200 when Plant Management directs that the plant be taken off-line by 1630.

Per the applicable load reduction procedure, there is a caution regarding running two condensate pumps at less than 30% power.

(1) Which one of the following identifies the procedure that will be used for the load reduction, and (2) what is the basis for the caution?

A. (1) O-2.1, Normal Shutdown To Hot Shutdown;
(2) Running two condensate pumps at < 30% power has caused the reject valve to open in automatic, resulting in a significant reduction in condensate pressure and NPSH concerns for the running MFP.

B. (1) O-2.1, Normal Shutdown To Hot Shutdown;
(2) Running two condensate pumps at < 30% power has caused dead-heading of one condensate pump with subsequent overheating and cavitation.

C. (1) AP-TURB.5, Rapid Load Reduction;
(2) Running two condensate pumps at < 30% power has caused the reject valve to open in automatic, resulting in a significant reduction in condensate pressure and NPSH concerns for the running MFP.

D. (1) AP-TURB.5, Rapid Load Reduction;
(2) Running two condensate pumps at < 30% power has caused deadheading of one condensate pump with subsequent overheating and cavitation.

SRO Question # 99

The TSC is being manned during a Site Emergency condition when the control room receives word that radiation levels in the TSC are approximately 75 mrem per hour.

Which one of the following identifies (1) the applicable procedure, and (2) the action the acting Emergency Coordinator (Shift Manager) should take?

(NOTE: "Appropriate TSC personnel' includes: Operations Assessment Manager, Chemistry Manager, TSC Director/Emergency Coordinator, Technical Assessment Manager, and Nuclear Assessment.)

A. (1) EPIP 1-9, Technical Support Center Activation;
(2) Have appropriate TSC personnel report to the Shift Manager's office and all other TSC personnel report to the Emergency Offsite Facility (EOF)

B. (1) EPIP 1-9, Technical Support Center Activation;
(2) Have appropriate TSC personnel report to the Shift Manager's office and all other TSC personnel report to the Training Center

C. (1) EPIP 2-10, In-plant Radiation Surveys;
(2) Have appropriate TSC personnel report to the Shift Manager's office and all other TSC personnel report to the Emergency Offsite Facility (EOF)

D. (1) EPIP 2-10, In-plant Radiation Surveys;
(2) Have appropriate TSC personnel report to the Shift Manager's office and all other TSC personnel report to the Training Center

SRO Question # 100

Given the following:

- The team is responding to a SGTR.
- Upon transition from E-0, Reactor Trip or Safety Injection, to E-3, Steam Generator Tube Rupture, a loss of offsite power occurred.
- RCS cooldown has been completed with the following plant conditions:

  - Containment pressure: 1.2 psig
  - PRZR level: Below narrow range indication
  - Ruptured SG pressure: 1030 psig
  - RCS pressure: 1400 psig

Which one of the following identifies how the subsequent RCS depressurization will be performed?

A. Using instrument air, open one PORV until RCS pressure is less than ruptured SG pressure and PRZR level is greater than 10%

B. Using instrument air, open one PORV until RCS pressure is less than ruptured SG pressure and PRZR level is greater than 30%

C. Align nitrogen to one PORV per ATT-12.0, ATTACHMENT N2 PORVS, and open that PORV until RCS pressure is less than ruptured SG pressure and PRZR level is greater than 10%

D. Align nitrogen to one PORV per ATT-12.0, ATTACHMENT N2 PORVS, and open that PORV until RCS pressure is less than ruptured SG pressure and PRZR level is greater than 30%

R. E. Ginna 2012 NRC Examination
RO/SRO Answer Key

1.	D	26.	B	51.	D	76.	A
2.	C	27.	A	52.	B	77.	A
3.	A	28.	D	53.	C	78.	D
4.	A	29.	D	54.	B	79.	B
5.	A	30.	C	55. Accept A &	B 11/9/12	80.	D
6.	A	31.	D	56.	A	81.	B
7.	A	32.	A	57.	A	82.	A
8.	D	33.	C	58.	A	83.	D
9.	C	34.	B	59.	B	84.	D
10.	B	35.	B	60.	C	85.	D
11.	B	36.	B	61.	C	86.	D
12.	D	37.	B	62.	D	87.	C
13.	D	38.	B	63.	A	88.	A
14.	C	39.	A	64.	A	89.	C
15.	B	40.	A	65.	B	90.	B
16.	A	41.	C	66.	D	91.	D
17.	D	42.	B	67.	B	92.	C
18.	B	43.	D	68.	D	93.	A
19.	C	44.	A	69.	D	94.	A
20.	C	45.	C	70.	C	95.	C
21.	D	46.	D	71.	A	96.	B
22.	B	47.	C	72.	B	97.	C
23.	D	48.	B	73.	C	98.	D
24.	C	49.	C	74.	C	99.	B
25.	D	50.	D	75.	A	100.	C

Answer Distribution: RO	Answer Distribution: SRO	Answer Distribution: Overall
Number of A's = 18	Number of A's = 6	Number of A's = 24
B's = 20	B's = 5	B's = 25
C's = 18	C's = 6	C's = 24
D's = 19	D's = 8	D's = 27

2012 Ginna Initial License NRC Examination

SRO Written Examination

Applicant Information			
Name:			
Date:	October 18, 2012	Facility/Unit:	R.E. Ginna
Region:	I	Reactor Type:	Westinghouse
Start Time:		Finish Time:	

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination, you must achieve a final grade of at least 80.00 percent overall, with 70.00 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require a final grade of 80.00 percent to pass. You have 8 hours to complete the combined examination, and 3 hours if you are only taking the SRO portion.

Applicant Certification

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

____

Applicant's Signature

Results		
RO/SRO-Only/Total Examination Values	____ / ____ / ____	Points
Applicant's Score	____ / ____ / ____	Points
Applicant's Grade	____ / ____ / ____	Percent

Master Copy

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	003	K6.14	
	Importance Rating	2.6		

Knowledge of the effect of a loss or malfunction on the following will have on the RCPS: Starting requirements.

RO Question # 1

Prior to starting the 'A' RCP to initiate a plant heatup, the following conditions exist:

- RHR system in service
- RCS filled and vented
- VCT pressure = 17 psig
- RCS pressure = 327 psig
- PRZR level = 50%
- 'A' Loop Cold Leg Temperature TI-409B = 170°F
- 'B' Loop Cold Leg Temperature TI-410B = 157°F
- 'A' S/G Handhold Temperature = 172°F
- 'B' S/G Handhold Temperature = 160°F
- 'A' RCP No.1 Seal D/P = 310 psid

For the given conditions, which of the following identifies a RCP starting requirement that is NOT satisfied?

A. VCT pressure

B. RCS pressure

C. No.1 Seal D/P

D. RCS to S/G ΔT

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because S-2.1 requires a minimum VCT pressure in order to start an RCP. Incorrect because the minimum pressure is > 15 psig. In this case the VCT pressure is satisfactory.

B. Incorrect. Plausible because there is an RCS pressure requirement per S-2.1. Incorrect because the requirement is approximately 325 psig.

C. Incorrect. Plausible because there is a No. 1 seal dp requirement. Incorrect because the requirement is greater than 220 psid.

D. Correct. Per S-2.1 S/G secondary water temperature must be < or equal to RCS cold leg temperature OR PRZR level must be <38%. Given that PRZR level >38%, this is too high, but is not one of the choices. The S/G temperatures are > cold leg temperature, which means the starting requirement is not met.

Technical Reference(s): S-2.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R1301C, 1.09 (As available)

Question Source: Bank # B003.0003

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	1		
	K/A #	007	EK1.02	
	Importance Rating	3.4		

Knowledge of the operational implications of the following concepts as they apply to the reactor trip: Shutdown Margin.

RO Question # 2

O-3.2, Shutdown Margin for an Operating Reactor, states that Tavg must be at program Tavg.

If O-3.2 is performed at 100% power with actual Tavg = 577ºF (and control rods in Manual), the Shutdown Margin (SDM) on a subsequent reactor trip would be:

_(1)_ than the calculated SDM because the power defect would add _(2)_ positive reactivity on the reactor trip.

	(1)	(2)
A.	higher	more
B.	higher	less
C.	lower	more
D.	lower	less

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because the second part is true and the examinee mistake the more positive reactivity as greater SDM. Incorrect because more positive reactivity means less SDM.

B. Incorrect. Plausible because the examinee could mistakenly take the negative sign from the power defect curve and forget to multiple it by the negative power change, resulting in adding negative reactivity instead of positive reactivity. This would result in greater SDM.

C. Correct. Higher Tavg would result in more positive reactivity inserted upon reactor trip and less SDM.

D. Incorrect. Plausible because the examinee could mistakenly take the negative sign from the power defect curve and forget to multiple it by the negative power change, resulting in adding negative reactivity instead of positive reactivity

Technical Reference(s): O-3.2

Proposed References to be provided to applicants during examination: None

Learning Objective: RRT05C 5.05
RRT08C 2.05

Question Source: Bank # B194.0005

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 1

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	004	K1.07	
	Importance Rating	2.6		

Knowledge of the physical connections and/or cause-effect relationships between the CVCS and the following systems: NIS.

RO Question # 3

The following conditions exist:

- MODE 3 at Normal Operating Temperature and Pressure, preparing for a normal Reactor Startup
- The RCS Boron level has been established at the value which the ECP was calculated
- Letdown Temperature Control valve controller, TCV-130 is in MANUAL
- All other controls are in AUTOMATIC and functioning normally

If the Letdown Relief Valve (RV-203) begins leaking to the PRT at a rate of 20 gpm and NO operator actions are taken, then Source Range counts will:

A. RISE due to cooler water exiting the Non-Regen letdown heat exchanger

B. RISE due to warmer water exiting the Non-Regen letdown heat exchanger

C. LOWER due to cooler water exiting the Non-Regen letdown heat exchanger

D. LOWER due to warmer water exiting the Non-Regen letdown heat exchanger

Proposed Answer: A

Explanation (Optional):

A. Correct. Opening RV-203 reduces letdown flow through the NRHX and lowers outlet temperature, resulting in a rise in SR counts.

B. Incorrect. Plausible if candidate incorrectly assumes the lower density of the warmer letdown water will cause the SRNIS to indicate higher.

C. Incorrect. Plausible if candidate incorrectly assumes the higher density of the cooler letdown water will cause the SRNIS to indicate lower.

D. Incorrect. Higher letdown flow with no increase in CCW cooling water flow will cause a letdown temperature rise. With higher temperature, the Letdown DI will release boron and add negative reactivity, which will cause SRNI counts to lower.

Technical Reference(s): P-3
R1601C

Proposed References to be provided to applicants during examination: None

Learning Objective: R1601C 2.05

Question Source:	Bank #	B010.0030	
	Modified Bank #		(Note changes or attach parent)
	New		

Question History: Last NRC Exam:

Question Cognitive Level:	Memory or Fundamental Knowledge	
	Comprehension or Analysis	X

10 CFR Part 55 Content: 55.41 5
55.43

Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	3		
	Group #	1		
	K/A #	G1	2.1.32	
	Importance Rating	3.8		

Conduct of Operations - Ability to explain and apply system limits and precautions.

RO Question # 4

Which one of the following statements describes a basis, as explained in P-12, ELECTRICAL SYSTEMS PRECAUTIONS, LIMITATIONS, AND SETPOINTS, for why the generator trip circuit is designed to be time-delayed, such that the generator trip occurs later than the turbine trip on most turbine trips?

A. On a Large Break LOCA the RCP can overspeed causing the motor flywheel to become a missile hazard which could damage the containment liner or ECCS components in containment.

B. On a Large Break LOCA the RCP can overspeed causing the RCP impeller to become a missile hazard which could damage the containment liner or ECCS components in containment.

C. On a Turbine Trip causing a Reactor Trip the RCP is locked at 60 HZ for 60 seconds to prevent a power-to-flow concern upon reactor trip.

D. On a Turbine Trip causing a Reactor Trip the RCP is locked at 60 HZ for 60 seconds to prevent an RCS pressure transient upon reactor trip.

Proposed Answer: A

Explanation (Optional):

A. Correct. Per P-12, on a major loss of coolant accident, the RCP impeller, shaft, flywheel, etc., can overspeed. RCP overspeed could cause catastrophic failure of the flywheel resulting in missiles which could damage the containment liner or ECCS components within containment.

B. Incorrect. Plausible because it is very similar to the correct answer. Incorrect because it identifies the RCP impeller as the missile hazard.

C. Incorrect. Plausible because it is very similar to the other basis for this time delay. Incorrect because the reactor trip involved has to be a reactor trip that provides DNB protection. The reactor trip from turbine trip does not provide DNB protection.

D. Incorrect. Plausible because it is very similar to the other basis for this time delay. Incorrect because the reactor trip involved has to be a reactor trip that provides DNB protection. The reactor trip from turbine trip does not provide DNB protection.

Technical Reference(s): P-12
P-1

(Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R0501C, 1.13

Question Source: Bank # C062.0053

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	005	K4.03
	Importance Rating	2.9	

Knowledge of RHRS design feature(s) and/or interlock(s) which provide or the following: RHR heat exchanger bypass flow control.

RO Question # 5

Which one of the following correctly identifies the valve position for RHR HX Bypass Flow Control Valve HCV-626: (1) on loss of Instrument Air and (2) on the failure of HCV-626 controller output to 100%?

	(1)	(2)
A.	Closed	Open
B.	Closed	Closed
C.	Open	Open
D.	Open	Closed

Proposed Answer: A

Explanation (Optional):

A. Correct. Bypass valve fails CLOSED on loss of air (624 & 626 fail OPEN), but the controller output to 100% results in valve going full OPEN

B. Incorrect. Plausible because the first half is correct and candidate might believe the controller is a reverse-acting (to closed) controller

C. Incorrect. Valve fails CLOSED on loss of IA (624 and 625 fail open) and the second half is correct

D. Incorrect. Valve fails CLOSED on loss of IA and the second half is plausible because the controllers for 624 and 625 fail in the opposite direction)

Technical Reference(s): P&ID: 33013-1247, Rev 44, ATT-11.0, IA Concerns (Attach if not previously provided)

Proposed References to be provided to applicants during examination:			None
Learning Objective:	R2501C 4.06		
Question Source:	Bank #		
	Modified Bank #		(Note changes or attach parent)
	New	X	
Question History:		Last NRC Exam:	
Question Cognitive Level:	Memory or Fundamental Knowledge		
	Comprehension or Analysis	X	
10 CFR Part 55 Content:	55.41	8	
	55.43		

Components, capacity, and functions of emergency systems.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	001 A2.14	
	Importance Rating	3.7	

Ability to (a) predict the impacts of the following malfunction or operations on the CRDS- and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Urgent failure alarm, including rod-out-of-sequence and motion-inhibit alarms.

RO Question # 6

During a plant load increase, with reactor power at 48%, the following occur:

- Control Bank C group 1 rod G-7 dropped
- Rod recovery is underway per ER-RCC.1, Retrieval of a Dropped RCC
- C-30, ROD CONTROL URGENT FAILURE ROD STOP, is received

Which one of the following explains (1) why the alarm actuated and (2) what action is required?

A. (1) All bank C group 2 rods lift coils are deenergized;
(2) Continue with ER-RCC.1

B. (1) All other bank C group 1 rods lift coils are deenergized;
(2) Continue with ER-RCC.1

C. (1) Group C rod moving with group D rods withdrawn;
(2) Respond per AR-C-30

D. (1) The step counter of the pulse to analog (P/A) converter was not reset to 0;
(2) Respond per AR-C-30

Proposed Answer: A

Explanation (Optional):

A. Correct. The Regulation Failure circuit senses no current in the Group 2 rods associated with Control Bank C. Part 2 is correct because this is an expected alarm.

B. Incorrect. Plausible because candidate may not know the regulator failure sensing circuit needs to sense current from only one rod (G-7).

C. Incorrect. Plausible because this involves something that is outside the normal sequence of rod motion. Part 2 is incorrect because this is an expected alarm and there is no need to determine the cause per AR-C-30.

D. Incorrect. Plausible because the pulse to analog (P/A) converter must be reset to 0 per the procedure, but this is not the cause of the expected alarm. Part 2 is incorrect because this is an expected alarm and there is no need to determine the cause per AR-C-30.

Technical Reference(s): ER-RCC.1
R3001C

Proposed References to be provided to applicants during examination: None

Learning Objective: R3001C 2.18

Question Source: Bank # B001.0044

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments: Ginna B Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	006	A2.04
	Importance Rating	3.4	

Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Improper discharge pressure.

RO Question # 7

The plant experienced a spurious SI. While performing E-0, the following plant conditions develop:

- RCS pressure lowers from 2000 psig and stabilizes at 900 psig
- Containment pressure, sump levels, and radiation levels are normal
- Auxiliary Building radiation levels are rising
- R-13, Plant Vent Particulate Monitor, is in alarm
- L-10, Aux Bldg Sump Auto Start annunciator has been received
- SI indications:

SI Pump "A" to RCS Loop "B"	
FI-924	0 gpm
PI-922	700 psig

SI Pump "B" to RCS Loop "A"	
FI-925	700 gpm
PI-923	1000 psig

Based upon these conditions and indications: (1) Identify the leak location and (2) What procedure will be used to mitigate this event?

A. (1) SI pump 'A' line to RCS loop 'B';
(2) ECA-1.2, LOCA Outside Containment

B. (1) SI pump 'A' line to RCS loop 'B';
(2) E-1, Loss of Reactor or Secondary Coolant

C. (1) SI pump 'B' line to RCS loop 'A';
(2) ECA-1.2, LOCA Outside Containment

D. (1) SI pump 'B' line to RCS loop 'A';
(2) E-1, Loss of Reactor or Secondary Coolant

Proposed Answer: A

Explanation (Optional):

A. Correct. SI flow should be evident to both RCS loops. The absence of flow to RCS loop B indicates a problem with this loop flow, and the additional AB indications support an RCS leak in the AB. Absent the CNMT indications, the transition to E-1 at Step 17 of E-0 should not occur and the crew should transition to ECA-1.2 at Step 27 based upon AB indications.

B. Incorrect. Plausible because the first part is correct, and E-1 is the procedure to respond to a LOCA. Part 2 is incorrect because ECA-1.2 is the correct procedure for the event.

C. Incorrect. Plausible because the second part is correct, and one might associate the higher flow and lower pressure with a leak downstream of the flow detector. Incorrect because downstream of the flow detector is inside CNMT.

D. Incorrect. Plausible because one might associate the higher flow and lower pressure with a leak downstream of the flow detector. Incorrect because downstream of the flow detector is inside CNMT. Part 2 is incorrect because ECA-1.2 is the correct procedure for the event.

Technical Reference(s): E-0, Steps 17 and 26 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RIE12C

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	009 EK2.03	
	Importance Rating	3.0	

Knowledge of the interrelations between the small break LOCA and the following: S/Gs.

RO Question # 8

The crew transitions to FR-H.1, Response to Loss of Secondary Heat Sink, 15 minutes after a reactor trip. Step 1 of FR-H.1 reads:

1 **Check If Secondary Heat Sink Is Required:**	
a. RCS pressure - GREATER THAN ANY NON-FAULTED S/G PRESSURE	a. IF RWST level greater than 28%, THEN return to procedure and step in effect. IF RWST level less than 28%, THEN go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

Which of the following explains the basis for transitioning from the FR-H.1 procedure in the RNO column?

A. Cold leg recirculation has not occurred. Must return to the procedure and step in effect and monitor RWST level

B. The intact SG is not functioning as a heat sink. Core decay heat can be removed by the faulted SG

C. Cold leg recirculation has not occurred. Must immediately transfer to cold leg recirculation

D. The intact SG is not functioning as a heat sink. Core decay heat can be removed by the RCS break flow

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because the examinee may miss the significance of RCS pressure and S/G pressure relationship and focus on whether or not cold leg recirculation was required based upon RWST level.

B. Incorrect. Plausible because while core heat removal may have been sufficient to remove decay heat until the faulted S/G dries out, long term decay heat removal is dependent on the availability of the intact S/G as a heat sink.

C. Incorrect. Plausible because the examinee may miss the significance of RCS pressure and S/G pressure relationship and determine that decay heat removal will depend upon the establishment of cold leg recirculation flowpath.

D. Correct . With the loss of heat sink condition which warranted entry into FR-H.1, the check of RCS pressure less than S/G pressure determines whether break size is large enough to remove decay heat without reliance upon intact S/G.

Technical Reference(s): FR-H.1 Background (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RFRH1C 2.01

Question Source: Bank # C000.0831

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments: This question satisfies the K/A because the interrelation between the small break LOCA and S/Gs is that the SGs serve as a secondary heat sink or a secondary heat source depending on their comparative pressures. If RCS pressure is greater than intact SG pressure the SG is required as a heat sink. If RCS pressure is less than intact SG pressure core decay heat can be removed by the RCS break flow, and the SG is a heat source rather than a heat sink. This question tests understanding of this knowledge

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	2		
	K/A #	011	K6.05	
	Importance Rating	3.1		

Knowledge of the effect of a loss or malfunction on the following will have on the PZR LCS: Function of PZR level gauges as post-accident monitors.

RO Question # 9

Given the following plant conditions:

- The plant has experienced an accident involving a significant and rapid reduction in RCS pressure
- Containment pressure is 35 psig and stable

For these types of accidents, indicated PRZR level will be __(1)__ than actual level and (2) Why?

A. (1) HIGHER
(2) These types of accidents will result in bubble formation in the reactor vessel and core uncovery

B. (1) LOWER
(2) These types of accidents will result in the inability to terminate SI when criteria are satisfied

C. (1) HIGHER
(2) These types of accidents result in large level-measurement errors due to hydrogen coming out of solution in the PRZR reference legs

D. (1) LOWER
(2) These types of accidents will result in the inability to regain normal PRZR pressure control

Proposed Answer: C

Explanation (Optional):

A. Incorrect. (1) Part 1 is correct for the reason given in C. Part (2) is plausible because while bubble formation is a possibility in some depressurization accidents, formation of a bubble in the vessel is not a given, and core uncovery is not an inevitable result.

B. Incorrect. P(1) Part 1 is plausible if the candidate doesn't know which high or low pressure side the reference legs are connected to, and therefore the impact of lower density due to the removal of H2 will be reversed. (2) is plausible if the candidate assumes that this lower level will prevent achieving the minimum PRZR level setpoint associate with SI termination.

C. Correct. (1) Indicated level is higher (a positive error bias) due to the lower density of the reference leg when H2 escapes from solution (effect is similar to reference leg heating)(2) is correct because this H2-coming-out-of-solution positive level measurement error was not considered when the EOP level setpoint values were established. This creates a situation where the heaters can be energized when actually uncovered, which could overheat the PRZR and lead to creep-rupture failure of the PRZR heater pressure boundary.

D. Incorrect. (1) is plausible if the candidate doesn't know which high or low pressure side the reference legs are connected to, and reverses the level bias. (2) is plausible because operation of the PZR heaters actually uncovered could lead to heater failure and loss of PZR pressure control.

Technical Reference(s): EOP-Directed-TSC-Actions document (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RMC07C, 1.01

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7, 10

55.43

- Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
- Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	2		
	K/A #	003	AK2.05	
	Importance Rating	2.5		

Knowledge of the interrelations between the Dropped Control Rod and the following: Control rod drive power supplies and logic circuits.

RO Question # 10

While operating at 100% power, a control bank 'D' rod dropped. The crew has entered ER-RCC.1, Retrieval of a Dropped RCC, and is ready to withdraw the dropped rod.

Per ER-RCC.1, Retrieval of a Dropped RCC, which of the following describes why the affected group step counter needed to be reset to zero?

A. This ensures that the P/A converter will send the proper rod height data to the RIL circuitry

B. This ensures that the rod is withdrawn to the proper height with a proper group step counter indication

C. This prevents a ROD CONTROL URGENT FAILURE annunciator from alarming during the rod recovery

D. This prevents a BANK D FULL ROD WITHDRAWAL annunciator from alarming during the rod recovery

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because the same signal that is sent to the step counters is also sent to the P/A converter (which, in turn, feeds the RIL computer). Incorrect because resetting the group step counter has nothing to do with the RIL circuitry.

B. Correct. Outward rod motion during the retrieval causes the associated group step counter to count up, requiring that the counter be zeroed prior to rod motion beginning.

C. Incorrect. Plausible because ROD CONTROL URGENT FAILURE is a concern during the dropped rod recovery. Incorrect because this has nothing to do with the ROD CONTROL URGENT FAILURE.

D. Incorrect. Plausible because it is correct, but is not the basis for resetting to zero. Incorrect because the step counter is reset to zero to ensures that the rod is withdrawn to the proper height with a proper group step counter indication.

Technical Reference(s): ER-RCC.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R3001C, 6.04

Question Source: Bank # C001.0140

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 6

55.43

Design, components, and functions of reactivity control mechanisms and instrumentation.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	026	2.1.27	
	Importance Rating	3.9		

Knowledge of system purpose and/or function. (Regarding the CS system)

RO Question # 11

Per UFSAR 6.2.2.2, in addition to heat removal, which one of the following is part of the design basis of the Containment Spray System for LOCA accidents?

A. Removes Hydrogen from the containment atmosphere

B. Removes Iodine from the containment atmosphere

C. Provides charcoal filter dousing

D. Lowers the pH of containment sump recirc water

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because while hydrogen generation is a concern during a LOCA, it is incorrect because CNMT Spray does not remove hydrogen from the containment atmosphere.

B. Correct. Per UFSAR 6.2.2.2.1.2, during a LOCA containment spray removes heat and iodine from the containment atmosphere

C. Incorrect. Plausible because CNMT spray can be aligned to provide charcoal filter dousing. Incorrect because, per UFSAR 6.5.1.2.2.5, even though charcoal filter dousing can be manually aligned for this function, this beyond the design basis requirements.

D. Incorrect. Plausible because while the addition of NaOH is added to maintain sump pH, it will RAISE the pH of the CNMT sump to offset the increased boron effects on sump pH.

Technical Reference(s):	R2401C UFSAR 6.2.2.2.1.2 UFSAR 6.5.1.2.2.5

Proposed References to be provided to applicants during examination: None

Learning Objective: R2401C, 1.01 (As available)

Question Source:	Bank #	C026.0031	
	Modified Bank #		(Note changes or attach parent)
	New		

Question History: Last NRC Exam:

Question Cognitive Level:	Memory or Fundamental Knowledge	X
	Comprehension or Analysis	

10 CFR Part 55 Content:	55.41	9
	55.43	

Shielding, isolation, and containment design features, including access limitations.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	1		
	K/A #	011	EK3.13	
	Importance Rating	3.8		

Knowledge of the reasons for the following responses as they apply to the Large Break LOCA: Hot-leg injection/recirculation.

RO Question # 12

A LOCA occurred approximately 5 hours ago.

Which one of the following states why simultaneous reactor vessel deluge and cold leg injection recirculation are initiated?

A. To reduce reactor vessel head temperature

B. To collapse steam voids in the upper reactor vessel region

C. To remove non-condensable gases from the reactor vessel

D. To flush concentrated boric acid from the core

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because reactor vessel head temperature may be elevated. Incorrect because the primary concern is that of [B] coming out of solution and plating out on vessel components.

B. Incorrect. Plausible because steam voiding at this point in the procedure the reactor vessel is expected to be covered, but the upper region of the head may have a steam void. Incorrect because this is not the primary purpose for realignment.

C. Incorrect. Plausible because non-condensable gases may accumulate in the vessel head region during this time period. Incorrect because the head region is not a concern at this time.

D. Correct. For the LBLOCA the boric acid solution will approach the solubility limit after 5 hours 49 minutes.

.

Technical Reference(s): ES-1.3 Background (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RES13C, 2.01

Question Source:	Bank #	C000.1104	
	Modified Bank #		(Note changes or attach parent)
	New		

Question History: Last NRC Exam:

Question Cognitive Level:	Memory or Fundamental Knowledge	x
	Comprehension or Analysis	

10 CFR Part 55 Content:	55.41	10
	55.43	

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	064	A1.03	
	Importance Rating	3.2		

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ED/G system controls including: Operating voltages, currents, and temperatures

RO Question # 13

Given the following conditions:

- The plant has experienced a large break LOCA with Loss of Offsite Power
- Neither EDG started automatically
- 'A' EDG was started from the main control board and Bus 14 and Bus 18 were manually loaded per ATT-8.5, ATTACHMENT LOSS OF OFFSITE POWER
- 'A' EDG load is currently 2155 KW

Which one of the following is (1) the LONGEST amount of time the diesel generator can be allowed to operate under these conditions, and (2) what action would be required to restore loading within limits.

	(1)	(2)
A.	0.5 hrs	reduce load by stopping redundant safeguards equipment
B.	0.5 hrs	no action required, loading will be reduced as the LOCA progresses
C.	2.0 hrs	reduce load by stopping redundant safeguards equipment
D.	2.0 hrs	no action required, loading will be reduced as the LOCA progresses

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Between the 1950 continuous and 2250 KW 2-hr limit, the D/G can be run for 2 hours. Part 1 is plausible if the examinee does not recall the limits and believes he is above the maximum load rating. Part 2 is plausible (but incorrect) because there is redundancy in safeguards equipment, but loading is managed by Att-8.5, Loss of Offsite Power, and RNO actions in E-1 to check D/G loading prior to starting equipment.

B. Incorrect. . Between the 1950 continuous and 2250 KW 2-hr limit, the D/G can be run for 2 hours. Part 1 is plausible if the examinee does not recall the limits and believes he is above the maximum load rating. Part 2 is correct (see D below)

C. Incorrect. Part 1 is correct: Between the 1950 continuous and 2250 KW 2-hr limit, the D/G can be run for 2 hours. Part 2 is plausible (but incorrect) because there is redundancy in safeguards equipment, but loading is managed by Att-8.5, Loss of Offsite Power, and RNO actions in E-1 to check D/G loading prior to starting equipment.

D. Correct. Each D/G is rated at: 1950 KW continuous operation, 2250 KW for 2 hours and 2300 KW for ½ hour. This load rating could be allowed for up to 2 hours. As indicated in the UFSAR loading ratings, current on the CNMT Recirc Fans will decrease as CNMT pressure/moisture is reduced without operator actions.

Technical Reference(s): (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective:

Question Source: Bank # C000.1273

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 8

55.43

Components, capacity, and functions of emergency systems

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	3		
	Group #	1		
	K/A #	G1	2.1.20	
	Importance Rating	4.6		

Conduct of Operations - Ability to interpret and execute procedure steps.

RO Question # 14

Given the following plant conditions:

- A large break LOCA has occurred
- Offsite power is available
- CNMT pressure is 22 psig and stable
- Both MSIVs are open
- SW pumps 'A' and 'D' were selected for auto start
- 'B' and 'C' SW pumps are running

For these conditions, per A-503.1, EMERGENCY AND ABNORMAL OPERATING PROCEDURES USERS GUIDE, which one of the following would require Manual Backup?

The failure of:

A. Automatic actuation of Containment Spray

B. Failure of 'A' and 'D' SW pumps to start

C. Automatic actuation of Main Steam Isolation

D. Automatic start of 'C' Safety Injection Pump

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because CS is one the examples of Manual Backup listed in A-503.1, and the examinee could believe that backup of failed manual CS initiation is appropriate. Incorrect because CNMT pressure has not reached the 28 psig setpoint for auto CS actuation.

B. Incorrect. Plausible because the selected SW pumps should have auto started, but these SI sequencer-related actions are not performed until directed by Att-27.0.

C. Correct. Per A-503.1, step 5.3.D, Manual Backup is the insertion of a manual trip, actuation, or control signal after a given parameter has reached or exceeded the setpoint for the corresponding automatic signal. Failure of MS Isolation at CNMT pressure > 18 psig is an example of an automatic actuation signal requiring Manual Backup.

D. Incorrect. Plausible because SI is one of the examples of Manual Backup listed in A-503.1. Incorrect because manual backup of automatic pump starts during SI is not an example of manual backup.

Technical Reference(s): A-503.1

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	008 K4.01	
	Importance Rating	3.1	

Knowledge of CCWS design feature(s) and/or interlock(s) which provide for the following: Automatic start of standby pump.

RO Question # 15

Given the following initial plant conditions:

- Plant at 100%, with a 50/50 normal electrical alignment.
- "B" CCW pump is in service.

Subsequently the following occurs:

- Offsite power circuit 767 trips
- The associated Emergency Diesel Generator fails to start

With no operator action, __(1)__ CCW pump will be running with __(2)__ CCW pump breaker red indicating light(s) lit on the MCB.

	(1)	(2)
A.	only A	only A
B.	only A	both
C.	only B	only B
D.	only B	both

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because the first part is correct, and the examinee may believe that the red lights would accurately reflect the status of the running CCW pump. Incorrect because both CCW pump red lights will be lit.

B. Correct. In the 50/50 electrical alignment, the loss of ckt 767 and "B" DG failure to start will result in no power to the "B" CCW pump. The "A" CCW pump still has offsite power available, and will start automatically as soon as CCW system pressure lowers to 50 psig. When the "A" CCW pump starts its associated breaker red indicating light will light. Although the "B" CCW pump has no power, its breaker is still closed, and therefore its red light is still lit. There is no UV trip for the CCW pumps. They will trip on SI + UV (27 relays) or SI + associated DG output breaker closed.

C. Incorrect.. Plausible because the examinee may confuse the 50/50 normal electrical alignment and the 50/50 alternate electrical alignment, in which case, only B CCW pump would be running. Also, the examinee may believe that the red lights would accurately reflect the status of the running CCW pump. Incorrect because the electrical alignment will result in only A CCW pump running with both red lights lit.

D. Incorrect. Plausible because the examinee may confuse the 50/50 normal electrical alignment and the 50/50 alternate electrical alignment, in which case, only B CCW pump would be running, and the second part is correct. Incorrect because the electrical alignment will result in only A CCW pump running with both red lights lit.

Technical Reference(s): P-12
10905-72A & B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R2801C 1.05 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	015/17 AA1.08	
	Importance Rating	3.0*	

Ability to operate and/or monitor the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): S/G LCS.

RO Question # 16

For a trip of "A" Reactor Coolant Pump below P-8, which of the following correctly describes the effect on the "A" SG level IMMEDIATELY after the RCP trip, and WHY?

'A' S/G level will:

A. lower due to the decreased amount of steam in the riser allowing more water to flow into the riser from the downcomer

B. rise in response to a higher steam flow as sensed from a lower steam pressure

C. lower to follow the new programmed level for the lower value of turbine impulse chamber pressure

D. rise due to an increased steam flow to compensate for a lower enthalpy rise across the U-tubes

Proposed Answer: A

Explanation (Optional):

A. Correct. The loss of RCP flow through the 'A' S/G results in a loss of heat input to the S/G and a rapid reduction in the steaming rate: i.e., the same effect as a rapid downpower. The S/G pressure rises, the number and size of bubbles in the boiling region to decrease, causing the water/steam mixture in the tube bundle region to occupy less volume, and the level in the S/G to drop (shrink).

B. Incorrect. Plausible because one may mistakenly think that steam pressure initially lowers. With pressure compensation this would affect steam flow. Incorrect because steam pressure will not lower.

C. Incorrect. Plausible because turbine impulse pressure does feed the SG level program, and the program level used to vary. Incorrect because the current program level is fixed at 52%.

D. Incorrect. Plausible if one is confused about the SG level response to reduced steam flow. Incorrect because the SG will experience shrink.

Technical Reference(s): R4401C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R4401C, 1.03

Question Source: Bank # C331.0217

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 14

55.43

Principles of heat transfer thermodynamics and fluid mechanics.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	010	K2.02	
	Importance Rating	2.5		

Knowledge of bus power supplies to the following: Controller for PZR spray valve.

RO Question # 17

Which one of the following would result in a loss of manual operation of the pressurizer spray valve controllers?

A. "A" auto-static transfer switch swapped to the alternate supply and a subsequent loss of MCC-C

B. "A" auto-static transfer switch swapped to the alternate supply and a subsequent loss of MCC-D

C. "B" auto-static transfer switch swapped to the alternate supply and a subsequent loss of MCC-C

D. "B" auto-static transfer switch swapped to the alternate supply and a subsequent loss of MCC-D

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because one might think manual operation of the MCB Controllers is powered from Inst Bus A. Incorrect because the MCB Controllers is powered from Inst Bus C.

B. Incorrect. Plausible because the examinee may confuse which MCC is the backup for the "A" inverter. Incorrect because manual operation of the MCB Controllers is powered from Inst Bus C.

C. Incorrect. Plausible because the examinee may confuse which MCC is the backup for the "B" inverter. Incorrect because MCC D is the backup for the "B" inverter.

D. Correct. Manual operation of the MCB Controllers is powered from Inst Bus C. Instr Bus C would be de-energized if "B" auto-static transfer switch swapped to the alternate supply and a subsequent loss of MCC-D.

Technical Reference(s): P-10, P-12 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RIC12C 1.04 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	1		
	K/A #	022	AA1.06	
	Importance Rating	2.9		

Ability to operate and / or monitor the following as they apply to the Loss of Reactor Coolant Makeup: CVCS charging pump ammeters and running indicators.

RO Question # 18

Consider the following conditions:

- A LOCA has occurred
- CNMT pressure is 36 psig and stable
- All Containment Recirc Fans are running at design maximum current load
- The crew is performing E-1, preparing to start the 'A' charging pump (6 amps)
- Offsite power is available
- Bus 14 ammeter reads 268 amps

Which one of the choices below correctly completes the following statements explaining the concern with charging pump starting current under these conditions, and whether or not conditions allow starting the 'A' charging pump.

The bus maximum __(1)__ load rating can be exceeded by loading additional non-safeguards loads, which could result in loss of the bus and its associated safeguards loads. Starting 'A" charging pump __(2)__ cause bus loading limitations to be exceeded.

	(1)	(2)
A.	continuous;	will
B.	continuous;	will not
C.	transient;	will
D.	transient;	will not

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because Part 1 is true, but the total Bus 14 current will not exceed 278 amps based on the given conditions.

B. Correct. The NOTE preceding the charging pump steps in the EOPs states that "If starting non-safeguards equipment will result in exceeding 278 amps on Buses 14 or 16, THEN DO NOT start non-safeguards equipment. Conditions in the root indicate Bus 14 amps would be 274 amps after charging pump start. The basis for this limit is that under certain conditions (High CNMT pressure), the limits on Bus or EDG continuous loading will be approached or exceeded by safeguards equipment alone.

C. Incorrect. Plausible because overcurrent concern is often based upon higher currents associated with equipment starting currents and because Part 2 is plausible if the candidate does not recall the 278 amp setpoint associated with the NOTE contained in the EOPs.

D. Incorrect. Plausible because overcurrent concern is often based upon higher currents associated with equipment starting currents. Part 2 is correct.

Technical Reference(s): E-1; E-1 Background (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: REP00C, 1.05
REP01C, 1.03

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency procedures for the facility.

Comments: SROs *and* ROs are trained on and expected to know the basis for cautions, notes, and major action categories for all EOPs and APs. Two sample lesson learning objectives are included above.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	014 K1.01	
	Importance Rating	3.2*	

Knowledge of the physical connections and/or cause effect relationships between the RPIS and the following systems: CRDS.

RO Question # 19

Given the following:

- The plant was at full power with step counters reading:
  - Shutdown Bank: 223 steps
  - Control Bank A: 224 steps
  - Control Bank B: 225 steps
  - Control Bank C: 225 steps
  - Control Bank D: 217 steps
- A reactor trip occurred.
- Following the trip rod C-7 in Control Bank D indicated 212 steps on MRPI.
- All other rods indicated 0 steps on MRPI.

Which one of the following alarms will be present due to rod C-7 immediately after reactor trip?

A. MCB alarm C-5, PPCS ROD SEQUENCE OR ROD DEVIATION

B. MCB alarm C-14, ROD BOTTOM

C. MRPI alarm Rod Deviation

D. MRPI alarm Rod Off Top

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because all other rods will exceed 12 steps from their bank position. Incorrect because rod C-7 is within 12 steps of its bank.

B. Incorrect. Plausible because C-14 will be in alarm from all other rods due to those rods being < 8 steps with the control bank > 32 steps. Incorrect for rod C-7 because it is NOT < 8 steps.

C. Correct. The MRPI rod deviation alarms when any two rods within a bank differ by 24 steps or more. All other Bank D rods are on bottom. Rod C7 being at 212 steps will result in this MRPI alarm.

D. Incorrect. Plausible because rod C-7 is < 224 steps. Incorrect because this alarm is only for shutdown banks, not control banks.

Technical Reference(s): AR-C-5
AR-C-14
R3101C
STP-O-1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R3101C 1.04

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 6

55.43

Design, components, and functions of reactivity control mechanisms and instrumentation.

Comments:

This question satisfies the K/A because it tests understanding of how RPIS responds to the CRDS when there is a stuck rod and the reactor trips.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	005	AA2.03
	Importance Rating	3.5	

Ability to determine and interpret the following as they apply to the Inoperable / Stuck Control Rod: Required actions if more than one rod is stuck or inoperable.

RO Question # 20

Assume the following plant conditions following a transient from 100% power:

- 90% power
- Tavg = 569ºF
- Group counter Bank D = 205 steps
- MRPI Rod C7 Bank D = 188 steps
- MRPI Rod K7 Bank D = 176 steps
- MRPI Rods G3 and G11 Bank D = 200 steps
- C-5, PPCS ROD SEQUENCE OR ROD DEVIATION, alarm lit
- F-29, PPCS AXIAL OR QUADRANT POWER TILT, alarm lit
- Rods are believed to be trippable
- The crew has entered AP-RCC.2, RCC/RPI Malfunction

Which one of the following describes the required action per AP-RCC.2?

A. Perform applicable portions of STP-O-1, ROD CONTROL SYSTEM

B. Insert Bank D to 200 steps and then realign rod K7

C. Shutdown per O-2.1, PLANT SHUTDOWN TO HOT SHUTDOWN

D. Withdraw control rods to restore Tavg to program

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because AP-RCC.2 directs verification of control rod operability per STP-O-1 during post rod recovery. Incorrect because this action would be valid only for a single misaligned rod. With 2 misaligned rods, a shutdown per O-2.1 is required.

B. Incorrect. Plausible if the examinee is not familiar enough with rod alignment indications and AP-RCC.2, and believes rod K7 meets alignment requirements (within

12 steps of G3 and G11) and there is a single misaligned rod. Incorrect because alignment is MRPI compared to the associated step counter.

C. Correct. AP-RCC.2 requires a load reduction for a single misaligned rod and a plant shutdown for >1 rod misaligned.

D. Incorrect. Plausible because control rod *insertion* is allowed for temperature control, but withdrawal is NOT allowed. Incorrect because with Tavg low, turbine load would be adjusted (lowered) to raise Tavg back to Tref value.

Technical Reference(s): AP-RCC.2 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R3001C 2.18

Question Source: Bank #

Modified Bank # B000.0877 (Note changes or attach parent)

New

Question History: Last NRC Exam: 2006

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments: Per ITS 3.1.4, Shutdown and control rods are OPERABLE if the rod is within alignment and trippable. They are INOPERABLE because they don't meet the surveillance requirement for alignment.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	012 K6.02	
	Importance Rating	2.9	

Knowledge of the effect of a loss or malfunction of the following will have on the RPS: Redundant channels.

RO Question # 21

Given the following conditions:

- Unit is at 100% power
- PR Channel N-44 indication began oscillating and was removed from service IAW ER-NIS.3, PR Malfunction
- I&C installed the P-10 jumper IAW ER-NIS.3
- PR Channel N-43 subsequently fails high

Which one of the following describes (1) plant response and (2) how this subsequent failure impacts plant operation?

A. (1) The reactor remains at power, and (2) Rod Control must be placed in MANUAL to stop rod motion.

B. (1) The reactor remains at power, and (2) Rod Control motion is blocked by an Auto Rod stop.

C. (1) The reactor will trip, and (2) SR N31 and N32 must be manually reinstated.

D. (1) The reactor will trip, and (2) SR N31 and N32 will reinstate automatically when appropriate power level is reached.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. The Rx will trip on 2/4 PRNIS Hi Flux 108%. Plausible if examinee incorrectly thinks trip logic is 2/3 on the remaining channels after the instrument defeat. This would be true for OTDT and OPDT runback and rod stop, not high flux trip.

B. Incorrect. The Rx will trip on 2/4 PRNIS Hi Flux 108%. Plausible if examinee incorrectly thinks trip logic is 2/3 on the remaining channels after the instrument defeat. This would be true for OTDT and OPDT runback and rod stop, not high flux trip.

C. Incorrect. First part is correct. Second part is incorrect. SRNIS will automatically reinstate due to the installation of the P-10 jumper during the defeat of N-44. Plausible if there is confusion on the purpose of the jumper.

D. Correct. The reactor will trip on 2/4 PR NIS Hi Flux 108% or 2/4 OTΔT due to N44 bistables defeated and the N43 failure high incurring a penalty on OTΔT setpoint. SRNIS will automatically reinstate due to the installation of the P-10 jumper during the defeat of N-44.

Technical Reference(s): ER-NIS.3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R3301C 3.06

Question Source: Bank # C015.0150

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	1		
	K/A #	025	2.4.11	
	Importance Rating	4.0		

Knowledge of abnormal condition procedures (regarding Loss of RHR).

RO Question # 22

- The plant is in Mode 5
- The RCS is at 0 psig and 115°F
- RCS loop level is at 35 inches when level begins rapidly lowering
- The crew enters the appropriate loss of RHR procedure as the running RHR pump begins to cavitate and is stopped
- The RO announces that level is 4 inches and is continuing to lower

Which one of the choices below identifies the RCS refill method that should be attempted first, in accordance with the preferred order of RCS refill methods provided in the AP?

A. SI Pumps to Hot Legs

B. Gravity Feed from the RWST

C. SI Pumps to Cold Legs

D. Charging to B Loop Cold Leg

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because four methods are presented in the preferred order of RCS refill methods. SI Pumps to Hot Legs is one of those methods. Incorrect because the first method presented, and the preferred method, is Gravity Feed from the RWST

B. Correct. Per note prior to AP-RHR.2 step 10, the steps are sequenced to indicate the preferred order of RCS refill methods. Step 10, the first of the four methods, is Gravity Feed from the RWST.

C. Incorrect. Plausible because four methods are presented in the preferred order of RCS refill methods. SI Pumps to Cold Legs is one of those methods. Incorrect because the first method presented, and the preferred method, is Gravity Feed from the RWST

D. Incorrect. Plausible because four methods are presented in the preferred order of RCS refill methods. Charging to B Loop Cold Leg is one of those methods. Incorrect because the first method presented, and the preferred method, is Gravity Feed from the RWST

Technical Reference(s): • AP-RHR.2

Proposed References to be provided to applicants during examination: None

Learning Objective: RAP25C, 1.04 RTA08C, 4.00 (As available)

Question Source: Bank #

Modified Bank # C000.0215 (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	013	A2.04	
	Importance Rating	3.6		

Ability to (a) predict the impacts of the following malfunctions or operations on the ESFAS; and (b) based Ability on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations; Loss of Instrument bus.

RO Question # 23

Given the following:

- The plant is operating at 35% power.
- All systems are in their normal alignment.
- Pressurizer pressure transmitter, PT-429 failed high.
- Before PRZR pressure channel 429 could be defeated, Instrument Bus 'D' failed (de-energized).

Immediately in response to the instrument bus failure, an automatic reactor trip _(1)__ actuate, and automatic Safety Injection __(2)__ actuate.

	(1)	(2)
A.	will	will
B.	will	will not
C.	will not	will
D.	will not	will not

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because the examinee may mistakenly believe that with PT-429 failed high, coupled with the loss of power to PT-449 channel and the tripping of its bistables on the loss of power, the 2/3 high pressure reactor trip logic is completed. Incorrect because PT-449 feeds only the low pressure reactor trip logic. The second part is plausible because the examinee might believe the loss of power to PT-449, as the controlling PRZR pressure channel, could cause the spray valves to open fully and eventually result in an actual low pressure SI condition. Incorrect because PT-449 failure will be LOW, and the pressurizer heaters will energize. The stem asks what the *immediate* response to the instrument bus failure is .

B. Incorrect. Plausible because the examinee may mistakenly believe that with PT-429 failed high, coupled with the loss of power to PT-449 channel and the tripping of its bistables on the loss of power, the 2/3 high pressure reactor trip logic is completed. Incorrect because PT-449 feeds only the low pressure reactor trip logic. The second part is correct, since the required 2/3 low pressure SI logic is not satisfied (PT-449 does not provide input into the low pressure SI logic).

C. Incorrect. Plausible because the first part is correct (see D below. If he also mistakenly assumes that PT-449 circuit is an input to the low pressure SI logic, the failure of instrument bus 'D' would result in the second signal required for the low pressure SI actuation. Incorrect because until the defeat of PT-429 is complete, no inputs to the low pressure SI logic have occurred and the loss of power to PT-449 has no further effect on SI, since PT-449 is not part of the low pressure SI logic circuit.

D. Correct. PT-429, 430, and 431 provide inputs to the low pressure trip, high pressure trip, AND low pressure SI logic. PT-449, powered from Instrument Bus 'D', provides input ONLY to the low pressure reactor trip logic. The PT-429 failure HI will provide one input into the high pressure reactor trip (2/3) logic, and no input into the low pressure trip and SI logics until the channel is defeated and its bistables are tripped. Since PT-449 *only* feeds the low pressure trip logic, and that bistable is tripped on the loss of power to Instrument Bus 'D', only a single low pressure trip signal exists from PT-449 until PT-429 bistables are defeated. With only 1/3 inputs to only the low pressure reactor trip (2/4) logic, no reactor trip and no low pressure SI actuation will occur.

Technical Reference(s): P10

Proposed References to be provided to applicants during examination: None

Learning Objective: R3501C, 1.07
RIC12C, 1.06

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:	Last NRC Exam:	
Question Cognitive Level:	Memory or Fundamental Knowledge	
	Comprehension or Analysis	X
10 CFR Part 55 Content:	55.41	7
	55.43	

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments: Since this is an RO question, part (b) of the K/A was not addressed, since part (a) has more relevance to the RO license position.

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	3		
	Group #	2		
	K/A #	G2	2.2.14	
	Importance Rating	3.9		

Equipment Control - Knowledge of the process for controlling equipment configuration or status.

RO Question # 24

As a qualified licensed operator, you have been directed to verify a tagout development as the second verifier.

Which one of the following is correct regarding the Tagout Development verification process?

Per CNG-OP-1.01-1007, Clearance and Safety Tagging, the second verifier is permitted to -

A. perform a walkdown of the work area with the Tagout First Verifier to determine the hazards involved

B. discuss the tagout with the Tagout First Verifier to better understand the tagout boundary

C. consult with technical experts to ensure the adequacy of the isolation boundary

D. assess the tagout boundary using marked-up prints attached to the tagout request

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because a walkdown of the work area and assessment /understanding of the hazards must be performed. Incorrect because these must be done independently.

B. Incorrect. Plausible because the Second Verifier must assess the tagout boundary independently. Incorrect because the assessment/understanding must be independent.

C. Correct. Per CNG-OP-1.01-1007 step 5.8B.7: "The Tagout Second Verifier may consult with technical experts in maintenance, work control, system engineering, engineering, radwaste, fire protection, operations or other personnel as necessary to make an informed decision on the adequacy of the isolation

D. Incorrect. Plausible because the tagout request may include attached marked-up prints. Incorrect because the Second Verifier must mark-up prints from a clean copy.

Technical Reference(s): CNG-OP-1.01-1007 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RAD30C 3.03

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	013	K5.02	
	Importance Rating	2.9		

Knowledge of the operational implications of the following concepts as they apply to the ESFAS: Safety System logic and reliability.

RO Question # 25

The plant was stable at full power when an electrical short resulted in the "A" train SI block switch failing to the “block” position (electronics failure such that the block switch appears to be held in the “block” position).

Which one of the following states the effect this will have on SI actuation signals?

A. All "A" train SI signals are immediately blocked.

B. A" train S/G and PRZR auto SI signals will remain fully functional. The remaining "A" train SI signals are immediately blocked.

C. "A" train Manual and high containment pressure SI signals will remain fully functional. The remaining "A" train SI signals are immediately blocked.

D. "A" train manual and high containment pressure SI signals will remain fully functional. “A” train S/G and PRZR auto SI signals will be blocked when PRZR pressure lowers to block setpoint.

Proposed Answer: D

Explanation (Optional):

A. Incorrect . Plausible because one might mistakenly think that “SI block” blocks all SI signals. Incorrect because manual and high containment pressure SI signals are not blocked.

B. Incorrect. Plausible because one might mistakenly think that “SI block” blocks all SI signals *except* S/G and PRZR signals. Incorrect because manual and high containment pressure SI signals are not blocked.

C. Incorrect. Plausible because this correctly identifies which signals are blocked. Incorrect because the block will not function until 2 of 3 PRZR pressures decrease to < 1992 psig (not *immediately* as stated).

D. Correct. With the switch failed in the "block" position, the block of PRZR and S/G SI signals will occur when 2 of 3 PRZR pressures decrease to < 1992 psig. The manual and HI CNMT pressure SI signals will remain fully functional.

Technical Reference(s): 33013-1353 sheet 6 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R3501C 6.08

Question Source: Bank # C012.0110

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	2	
	K/A #	G2 2.2.42	
	Importance Rating	3.9	

Ability to recognize system parameters that are entry-level conditions for Technical Specifications

RO Question # 26

The crew has placed the Containment Mini-Purge system in service and notes that Containment Pressure is 0.4 psig and rising slowly.

If pressure continues to rise, the crew will be required to enter a Tech Spec Action statement at __(1)__ psig, which is the initial pressure used in the analysis for determining the peak pressure limit. The design basis accident for the peak pressure limit in Containment is __(2)__ .

A. (1) 0.5 psig; (2) Steamline break inside CNMT

B. (1) 1.0 psig; (2) Steamline break inside CNMT

C. (1) 0.5 psig; (2) LOCA

D. (1) 1.0 psig; (2) LOCA

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because the value in (1) is the MCB alarm setpoint which would require CNMT depressurization while (2) is the correct accident.

B. Correct. Per ITS 3.6.4 basis, the initial pressure condition used in the containment analysis was 15.7 psia (1.0 psig). The maximum containment pressure resulting from the worst case steamline break, 59.6 psig, does not exceed the containment design pressure of 60 psig.

C. Incorrect. Plausible because the value in (1) is the MCB alarm setpoint which would require CNMT depressurization, while (2) is plausible because peak CNMT pressure following DBA LOCA is a valid concern (but not after EPU).

D. Incorrect. Plausible because (1) is the correct setpoint and (2) is plausible because peak CNMT pressure following DBA LOCA is a valid concern (but not after EPU).

Technical Reference(s):	ITS Basis B3.6.4	(Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R2101C, 1.12 and 1.13

Question Source:	Bank #		
	Modified Bank #		(Note changes or attach parent)
	New	X	

Question History: Last NRC Exam:

Question Cognitive Level:	Memory or Fundamental Knowledge	X
	Comprehension or Analysis	

10 CFR Part 55 Content:	55.41	7
	55.43	

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	022 K4.01	
	Importance Rating	2.5*	

Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following: Cooling of containment penetrations.

RO Question # 27

Which one of the following correctly identifies an interlock associated with the penetration cooling fans?

A. Only one of the two fans can be run at a time

B. Fire protection switches trip the associated fan

C. High vibration trips the associated fan

D. High alarm on R-13, Plant Vent Particulate, trips the running fan and prevents start of the standby fan

Proposed Answer: A

Explanation (Optional):

A. Correct. Electrical drawing confirms that only 1 of 2 fans can be run at a time, and that there are no other interlocks.

B. Incorrect. Plausible because fire protection switches trip the CNMT Purge Supply and Exhaust Fans. Incorrect because these switches are not applicable to the penetration cooling fans.

C. Incorrect. Plausible because high vibration trips the Reactor Compartment Cooling Fans and the CNMT Auxiliary Charcoal Filter Fans. Incorrect because high vibration does not trip the penetration cooling fans.

D. Incorrect. Plausible because R-13 alarm during mini-purge operation isolates the plant vent and requires the operators to secure the mini-purge system. The examinee may confuse this with penetration cooling fan operation. Incorrect because the R-13 alarm is not applicable to the penetration cooling fans.

Technical Reference(s): AR-C-17
10905-0210 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R2201C, 5.01

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 4

55.43

Secondary coolant and auxiliary systems that affect the facility

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	026 AK3.04	
	Importance Rating	3.5	

Knowledge of the reasons for the following responses as they apply to the Loss of Component Cooling Water: Effect on the CCW flow header of a loss of CCW.

RO Question # 28

- RCS cooldown from 350F is in progress per O-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD SHUTDOWN CONDITIONS
- 'A' RHR pump is running
- A 50 gpm CCW leak developed at a weld in the header downstream of FI-619, CCW HX OUTLET

Which of the following identifies the applicable flow limit that the CCW system will be operating closer to, as compared to system flow conditions prior to the leak?

A. 1000 gpm

B. 1800 gpm

C. 2400 gpm

D. 4900 gpm

Proposed Answer: D

Explanation (Optional):

A. Incorrect. 1000 gpm is the CCW SERVICE WATER LO FLOW alarm setpoint. Plausible if the examinee confuses this with the CCW flow limit.

B. Incorrect. 1800 gpm is the CCW SYSTEM LO FLOW alarm setpoint. Plausible if the examinee confuses normal at power CCW flow with plant cooldown, which requires 2 CCW pumps and 2 CCW Heat Exchanger to be in service. Incorrect because this is a low flow alarm and the limit is a high flow limit.

C. Incorrect. 2400 gpm is the maximum CCW flow with 1 CCW pump and 1 CCW HX. Plausible if the examinee is not familiar enough with O-2.2, which requires 2 CCW pumps and 2 CCW Heat Exchangers to be in service for plant cooldown from 350F.

D. Correct. Per P-4, section 6.2.11, 4900 gpm is the maximum CCW flow for 2 CCW pumps and 2 CCW Heat Exchangers in service. Per O-2.2, 2 CCW pumps and 2 CCW Heat Exchangers must be in service during RCS cooldown from 350F.

Technical Reference(s): P-4
O-2.2

Proposed References to be provided to applicants during examination: None

Learning Objective: R2801C 3.04 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	2		
	K/A #	015	K2.01	
	Importance Rating	3.3		

Knowledge of bus power supplies to the following: NIS channels, components, and interconnections.

RO Question # 29

Given the following:

- A loss of all AC power occurred 25 minutes ago.
- The crew is performing actions of ECA-0.0, Loss of All AC Power.
- 125 VDC power switches in REACTOR PROTECTION racks RLTR-1 and RLTR-2 have been turned OFF.
- AC Power has NOT been restored.

Which ONE of the following describes which Source Range (N-31, N-32) and Intermediate Range (N-35, N-36) NIS instruments are still available?

A. N-35 ONLY

B. N-31 and N-35 ONLY

C. N-32 and N-36 ONLY

D. N-31, N-32, N-35 ONLY

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because if the candidate does not understand that P-10 de-energizes both SR instruments until the 125VDC power switches are turned OFF, only N35 would be energized from Instrument Bus 'A'

B. Incorrect. Both channels are powered from Instrument Bus 'A'. Plausible if candidate believes only Instrument Bus 'A' is energized, but Instrument Bus 'C' is also on an inverter.

C. Incorrect. Plausible if candidate believes that N-32 and N-36 are both powered from Instrument Bus 'C'. In reality, while N-32 is powered from instrument bus 'C', N-36 is powered from non-inverter-supplied bus 'B.'

D. Correct. Instrument Busses 'A' and 'C' remain energized because they are powered from inverters.Instrument busses 'B' and 'D' will de-energize because they are powered from MCCs 'B' and 'C', which de-energize and remain de-energized on LOOP. N-31 and N-35 are powered from 'A', only N-32 from 'C'. Until the 125VDC power switches are turned OFF, the P-10 interlock (from N42 and N44 de-energized) has prevented the SR instruments from re-energizing.

Technical Reference(s): P-12, Attachment 4

Proposed References to be provided to applicants during examination: None

Learning Objective: R0901C, 3.01 (As available)

Question Source: Bank #

Modified Bank # C003.0119 (Note changes or attach parent)

New

Question History: Last NRC Exam: 2009

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	2		
	K/A #	036	AK3.03	
	Importance Rating	3.7		

Knowledge of the reasons for the following responses as they apply to the Fuel Handling Incidents: Guidance contained in EOP for fuel handling incident.

RO Question # 30

During movement of an irradiated fuel assembly from the core to the upender (not indexed over the core), the following events occur:

- Annunciator K-29, SFP HI TEMP 115ºF HI-LO LEVEL 20" 12", alarms
- Soon after the K-29 alarm, a report from the manipulator crane operator informs you in the control room that refueling cavity level is rapidly dropping
- Manipulator crane radiation monitor is in alarm
- Containment sump 'A' level is rising on LI-2039/2044 control room indication

Which ONE of the choices correctly completes the following statement per RF-601, Fuel Handling Accident Instructions, regarding required actions with respect to the fuel assembly being moved?

Position the fuel assembly over the designated ___(1)___, lower the assembly to the bottom position and ___(2)___.

A. (1) core location, (2) leave the assembly latched

B. (1) core location, (2) unlatch the assembly

C. (1) location in the transfer slot, (2) leave the assembly latched

D. (1) location in the transfer slot, (2) unlatch the assembly

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because if the fuel assembly was positioned over the core it would be lowered back into the core and unlatched. Incorrect because the fuel assembly is not indexed over the core and it's left latched.

B. Incorrect. Plausible because if the fuel assembly was positioned over the core it would be lowered back into the core and unlatched. Incorrect because the fuel assembly is not indexed over the core.

C. Correct. Per RF-601, if the fuel assembly is in transit between the core and upender, immediately position the fuel assembly over the emergency location in the transfer slot area and lower the assembly until it reaches the bottom of the slot area AND leave the fuel assembly latched with power removed from the crane.

D. Incorrect. Plausible because the location is correct (per C above), but the assembly is incorrectly unlatched.

Technical Reference(s): RF-601

Proposed References to be provided to applicants during examination: None

Learning Objective: RRF01C, 3.00 (As available)

Question Source: Bank # B034.0002

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10

55.43 7

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Fuel handling facilities and procedures.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	022 2.4.31	
	Importance Rating	4.2	

Knowledge of annunciator alarms, indications, or response procedures. (Regarding Containment Cooling)

RO Question # 31

Given the following:

- The plant is at full power.
- Annunciator C-10, CONTAINMENT RECIRC CLRS WATER OUTLET LO FLOW, is lit.
- One SW pump is running.

Per the alarm response, annunciator C-10 alarms when Service Water flow from any CNMT Recirc Fan is less than __(1)__ gpm and either CNMT Recirc Fan(s) service water outlet (FCV-4561/FCV-4562) is full open; and, with only a single service water pump operating, refer to __(2)__ .

	(1)	(2)
A.	1100	AP-SW.1, Service Water Leak
B.	1100	AP-SW.2, Loss of Service Water
C.	1050	AP-SW.1, Service Water Leak
D.	1050	AP-SW.2, Loss of Service Water

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because the examinee can easily confuse alarm C-10, CONTAINMENT RECIRC CLRS WATER OUTLET LO FLOW 1050 GPM with the setpoint of alarm K-21, SFP LOW FLOW , which is 1100 gpm. Part 2 is plausible because license class students are always challenged to differentiate entry to AP-SW.1 versus AP-SW.2. Additionally, both AP-SW.1 and AP-SW.2 verify at least one SW pump running in each loop. Incorrect because C-10 alarms when flow is < 1050 gpm, and the appropriate procedure for a single pump running is AP-SW.2.

B. Incorrect. Plausible because the examinee can easily confuse alarm C-10, CONTAINMENT RECIRC CLRS WATER OUTLET LO FLOW 1050 GPM with the setpoint of alarm K-21, SFP LOW FLOW , which is 1100 gpm, and the second part is correct. Incorrect because C-10 alarms when flow is < 1050 gpm.

C. Incorrect. Plausible because the first part is correct, and license class students are always challenged to differentiate entry to AP-SW.1 versus AP-SW.2. Both AP-SW.1 and AP-SW.2 are referred to in the required actions section. Additionally, both AP-SW.1 and AP-SW.2 verify at least one SW pump running in each loop. Incorrect because the appropriate procedure for a single pump running is AP-SW.2.

D. Correct. Per the Alarm Response, the alarm setpoint is < 1050 gpm, and the correct procedure is AP-SW.2.

Technical Reference(s): AR-C-10

Proposed References to be provided to applicants during examination: None

Learning Objective: R5101C 1.04

Question Source:	Bank #		
	Modified Bank #		(Note changes or attach parent)
	New	X	

Question History: Last NRC Exam:

Question Cognitive Level:	Memory or Fundamental Knowledge	
	Comprehension or Analysis	X

10 CFR Part 55 Content:	55.41	10
	55.43	

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments: Administratively, the plant cannot operate at full power with only a single service water pump running. The question states: “if only a single service water pump is operating”. This infers that one or more service water pumps must have tripped. There is no information suggesting that a service water leak exists. With the lack of specifics, the examinee cannot assume that a leak exists. Therefore, the appropriate procedure must be AP-SW.2. The examinee must use system knowledge to determine what would cause the alarm, and recognize the purpose of the AP-SW procedures to select the appropriate procedure. Just recognizing the purpose makes this an RO question rather than an SRO only question.

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	1		
	K/A #	027	AK2.03	
	Importance Rating	2.6		

Knowledge of the interrelations between the Pressurizer Pressure Control Malfunctions and the following: Controllers and positioners.

RO Question # 32

Which one of the following describes the expected plant response to a controlling pressurizer pressure channel failure high while operating at 100% power?

Assume no operator action:

A. Actual pressure will lower until low pressure reactor trip and SI and then stabilize

B. Actual pressure will lower until low pressure reactor trip and then slowly rise back to program

C. Actual pressure will lower until the other control channel actuates heaters and then stabilize below program but above the trip setpoint

D. Plant will trip on high pressure trip but actual pressure will lower until low pressure SI and then stabilize

Proposed Answer: A

Explanation (Optional):

A. Correct. Controlling channel will drive the output of Master Pressure Controller 431K to maximum, resulting in both spray valves full open and a rapid reduction in actual pressure. Pressure will lower until reactor trip and SI occur, and the CI signal which results from the SI signal will close AOV-5392, the CNMT instrument air supply valve. Since the spray valves are operated by IA and will fail to closed position, isolation of the 5392 valve will close the air supply to the spray valves and terminate the transient.

B. Incorrect. Plausible because after the reactor trip the candidate might believe the transient would be "over" and allow pressure to recover. Spray valves are still open until the SI signal actuates.

C. Incorrect. Plausible because the candidate might not realize that the heaters are tripped off due to the high pressure condition sensed by the controlling channel.

D. Incorrect. Plausible if the candidate believes that the controlling channel failing hi will result not in spray valve actuation, but rather pressurizer heater actuation until the HIGH pressure trip setpoint is reached.

Technical Reference(s): P-10, Instrument Failure Reference Manual

Proposed References to be provided to applicants during examination: None

Learning Objective: R1901C 4.04 RIC02C 1.02 (As available)

Question Source:	Bank #	C010.0037	
	Modified Bank #		(Note changes or attach parent)
	New		

Question History: Last NRC Exam:

Question Cognitive Level:	Memory or Fundamental Knowledge	
	Comprehension or Analysis	X

10 CFR Part 55 Content:	55.41	10
	55.43	

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	008	2.4.21	
	Importance Rating	4.2		

Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc. (Regarding Component Cooling Water)

RO Question # 33

Given the following initial plant conditions:

- "A" CCW pump is out of service
- A simultaneous LOCA and loss of offsite power occurred.
- "B" DG failed to start.

A transition to FR-C.2, Response To Degraded Core Cooling, has just occurred with the following conditions:

- "A" RHR pump has been running for 30 minutes
- "A" and "D" SW pumps are running

Which one of the following describes operating limitations, if any, on "A" RHR pump?

A. No limitations. SW cools the pump mechanical seal cooler.

B. No limitations. An RHR pump recirculation flow path is available.

C. It can be run for a maximum of 30 minutes longer. Beyond that, pump failure can occur.

D. It can be run for a maximum of 60 minutes longer. Beyond that, motor failure can occur.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because the examinee may not recall that the RHR pump seal cooler is CCW cooled. Incorrect because the RHR pump require CCW cooling, and there is a time limitation.

B. Incorrect. Plausible because the RHR pump has a recirculation flow path. Incorrect because the recirc flow path is back to the RHR pump suction, and there is a time limitation.

C. Correct. For the given conditions, the 'A' DG is supplying power to 480V Bus 14 and 'A' CCW pump, but 'A' CCW pump is OOS. With 'B' CCW pump originally supplying CCW, the LOOP and failure of 'B' DG to start results in loss of power to 'B' CCW pump and loss of CCW flow. CCW provides cooling only to the pump mechanical seal cooler, not the motor. The caution prior to step 14 of FR-C.2 states that the RHR pumps should not be run longer than 1 hour without CCW to the RHR heat exchangers. The background explains that this time limit is based on damage to the RHR pumps due to overheating.

D. Incorrect. . Plausible because the time limit is 1 hour, and the examinee may believe that CCW is supplied to a motor cooler. Part 1 is incorrect because the RHR pump has already been running for 30 minutes, and an additional 60 minutes would exceed the permissible run time without cooling. Part 2 is incorrect because CCW does not provide cooling to the motor.

Technical Reference(s): FR-C.2
FR-C.2 background
ITS-B3.7.7

Proposed References to be provided to applicants during examination: None

Learning Objective: RFRC1C 1.03 (As available)

Question Source: Bank #
Modified Bank # C008.0061 (Note changes or attach parent)
New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10
55.43

- Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	3		
	Group #	2		
	K/A #	G2	2.2.38	
	Importance Rating	3.6		

Equipment Control - Knowledge of conditions and limitations in the facility license.

RO Question # 34

Given the following conditions:

- The RCS is at 350°F, going solid IAW O-2.2, Plant Shutdown from Hot Shutdown to Cold Conditions.
- The operators become distracted by reports of a welding gas bottle explosion in the turbine building.
- As a result of the passive failure of several overpressure protection components coupled with the distraction, RCS pressure rises and stabilizes at 2800 psig before operators respond.

Select the choice which correctly completes the following statement:

In accordance with the most time-limiting applicable Technical Specification, pressure must be reduced to restore compliance _________.

A. immediately

B. within 5 minutes

C. within 30 minutes

D. within 1 hour

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because many specs require immediate response.

B. Correct. To comply with RCS Pressure safety limit in Modes 3, 4, and 5 and is the most time-limiting of applicable Tech Specs, requiring compliance within 5 minutes.

C. Incorrect. Plausible because this is the correct time for compliance with TS LCO 3.4.3, RCS P/T Limits

D. Incorrect. Plausible because this is the correct answer for compliance with RCS Pressure SL 2.1.2 when in Modes 1 or 2.

Technical Reference(s): ITS 2.1.2

Proposed References to be provided to applicants during examination: None

Learning Objective: RTS21C, 2.03 (As available)

Question Source: Bank # C000.1060

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 5

55.43

Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	026	K3.01	
	Importance Rating	3.9		

Knowledge of the effect that a loss or malfunction of the CSS will have on the following: CCS.

RO Question # 35

The plant has experienced a LOCA, followed by an automatic SI initiation and containment spray actuation. The following conditions exist:

- 'D' CRFC out of service for maintenance
- Containment pressure = 40 psig and rising
- RHR pumps are in standby
- L-5, SAFEGUARD BUS MAIN BREAKER OVERCURRENT TRIP, is lit
- The normal supply breaker to Bus 16 opened and Bus 16 is de-energized

.

Which ONE of the following correctly describes plant conditions and/or operator actions with regard to containment peak design pressure and temperature limits?

A. There is adequate equipment available, per design, to maintain within limits

B. Limits, per design, will not be exceeded if 'D' CRFC is restored

C. Start an additional Service Water pump to maintain within limits

D. Limits, per design, will not be exceeded if 'B' EDG is manually started

Proposed Answer: B

Explanation (Optional):

A. Incorrect. See below. Plausible because it's essential that the candidate realize that 'B' and 'C' CRFCs are powered from Bus 16, leaving only a single CRFC available.

B. Correct. With 'D' CRFC out for maintenance and Bus 16 de-energized (CRFC 'B' & 'C'), only 1 CRFC is operating along with the single 'A' CS pump. Adequate CNMT cooling requires both CS pumps, or all 4 CRFCs, or 1 CS pump and 2 CRCFs. EDGs can't power up Bus 16 due to the unknown bus fault. Need to restore either Bus 16 or the 'D' CRFC.

C. Incorrect. Plausible because candidate may believe starting additional SW cooling flow will remedy the cooling problem, when in fact the minimum equipment requirements cannot be met.

D. Incorrect. Plausible because although the actions seem conservative, the root information identifies that there is an unknown bus fault on Bus 16 (which would prevent the EDG output breaker for Bus 16 from closing in on the bus).

Technical Reference(s): ITS 3.6.6 Basis

Proposed References to be provided to applicants during examination: None

Learning Objective: R2401C 1.01 (As available)

Question Source: Bank # C024.0001

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	2		
	K/A #	037	2.1.28	
	Importance Rating	3.6		

Knowledge of the purpose and function of major system components and controls. (Regarding SGTL)

RO Question # 36

Given the following:

- The plant is operating at 90% power
- A primary-to-secondary S/G tube leak is indicated by R-47 (Air Ejector Noble Gas Radiation Monitor)
- Per the procedure in effect, the AO closes V-996A, Inlet block valve to FI-2027 (S/G Blowdown HX 'A' outlet flow), and the R-19 (Steam Generator Blowdown) counts rise

(1) What specific indication is provided by this rise in counts, and (2) what would be the effect if counts continued to rise to the Alarm setpoint?

A. (1) Primary leakage is indicated on 'A' S/G;
(2) V-5737/5738, S/G Blowdown AOVs will close

B. (1) Primary leakage is indicated on 'B' S/G;
(2) V-5737/5738, S/G Blowdown AOVs will close

C. (1) Primary leakage is indicated on 'A' S/G;
(2) V-5709/5710, S/G 'A' and 'B' blowdown isolation AOVs to Blowdown Flash Tank will close

D. (1) Primary leakage is indicated on 'B' S/G;
(2) V-5709/5710, S/G 'A' and 'B' blowdown isolation AOVs to Blowdown Flash Tank will close

Proposed Answer: B

Explanation (Optional):

A. Incorrect. S/G leakage indication is wrong; automatic actuation is correct.

B. Correct. Closing V-996A isolates all sample flow from S/G 'A' to R-19. Indication on R-19 would rise if the leak is on S/G 'B' due to less dilution from the S/G 'A' flowpath. R-19 reaching the HI alarm will result in automatic isolation of S/G blowdown and sample line isolation valves (AOV-5735/5736/5737/5738)

C. Incorrect. Incorrect leak location; AOV-5709/5710 close on turbine trip and high level in the blowdown flash tank.

D. Incorrect. Correct leak location, but AOV-5709/5710 close on turbine trip and high level in the blowdown flash tank.

Technical Reference(s): ATT-16.1
P&ID 33013-1278, sheets 1 & 2
AR-K-13

Proposed References to be provided to applicants during examination: None

Learning Objective: R6601C, 1.04
RAP32C, 2.01 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10, 11

55.43

- Administrative, normal, abnormal, and emergency operating procedures for the facility
- Purpose and operation of radiation monitoring systems, including alarms and survey equipment.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	039 K3.06	
	Importance Rating	2.8*	

Knowledge of the effect that a loss or malfunction of the MRSS (Main and Reheat Steam Sys) will have on the following: SDS.

RO Question # 37

The plant is operating at full power with the following conditions:

- Steam Dump Mode Selector Switch and controller in "AUTO"
- Control rods in "MANUAL"
- Main turbine control valve 3464 failed closed
- Generator output reduced to 515 MW

Which one of the below statements describes the operation of the condenser steam dump valves?

A. Steam dump valves will not open because the arming signal will not actuate

B. Steam dump valves will open when the temperature error exceeds 4ºF and some valves will remain open

C. All steam dump valves will snap open initially, but then modulate closed to match Tavg with Tref

D. All steam dump valves will go full open and will remain full open until control rods are driven in to match Tavg with Tref

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because the candidate may believe that a control valve failure will not cause a large enough load reduction to arm the steam dumps.

B. Correct. Steam dumps will arm with >10% load rejection due to the control valve failure. Rod control in Manual will not compensate for the rise in RCS temperature, and thus the steam dumps will modulate open with a 4ºF temperature error between Tavg – Tref.. If control rods are not inserted, some steam dump valves will remain open.

C. Incorrect. Plausible because it may be assumed that a control valve failure with rods in manual may cause a large enough temperature error to cause all steam dump valves to initially snap open. .

D. Incorrect. Plausible because the candidate may assume that all steam dump valves will full open due to the magnitude of the temperature error, but they do not remain full open..

Technical Reference(s): P-10

Proposed References to be provided to applicants during examination: None

Learning Objective: R4501C 2.02 (As available)

Question Source: Bank #
Modified Bank # C041.0048 (Note changes or attach parent)
New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10
55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments: Steam dump arming and described CORRECT response verified on the simulator.

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	1		
	K/A #	038	EK1.01	
	Importance Rating	3.1		

Knowledge of the operational implications of the following concepts as they apply to the SGTR: Use of steam tables.

RO Question # 38

The plant has been tripped from 100% power due to a SGTR in SG 'A', concurrent with a loss of offsite power. The crew is responding to the event in E-3, SGTR.

Current conditions are:

- RCS pressure – 1600 psig
- SG 'A' – 950 psig
- SG 'B' – 800 psig

In preparation for the cooldown step, and using steam tables, which of the following is the approximate CET temperature associated with 20°F subcooling after the cooldown in response to the SG tube rupture in E-3?

A. 500 degrees

B. 520 degrees

C. 540 degrees

D. 560 degrees

Proposed Answer: B

Explanation (Optional):

A. Plausible because 500 is the approximate target CET temperature required by E-3 Step 10 table for a 950 psig SG. The EOP value includes additional margin beyond the 20 degrees subcooling.

B. Correct answer. Applicant must apply understanding of E-3 mitigation strategy to identify that the subcooling is in relation to the pressure of the affected SG, next determine saturation temperature for that SG and then subtract 20 degrees

C. Plausible because 540 is 20 degrees away from the saturation temperature for the unaffected SG. It is also the saturation temperature for the affected SG.

D. Plausible because 560 would be the value obtained if 20 degrees were added to, rather than subtracted from, the saturation temperature of the affected SG.

Technical Reference(s): Steam Tables

Proposed References to be provided to applicants during examination: Steam Tables

Learning Objective: REP03C, 2.01 (As available)

Question Source: Bank #
Modified Bank # (Note changes or attach parent)
New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 14
55.43

Principles of heat transfer thermodynamics and fluid mechanics.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	2		
	K/A #	033	2.2.22	
	Importance Rating	3.6		

Knowledge of limiting conditions for operations and safety limits. (Regarding SFP)

RO Question # 39

Which one of the following conditions would prohibit full core offload to the SFP during refueling outage?

A. SFP temperature 49 degrees F

B. "B" Aux Bldg Exhaust fan is out of service for repairs

C. Aux Bldg crane interlock is by-passed to allow access to the Decon Pit

D. Fuel Transfer System Valve (Canal/Tube Isolation) light de-energized

Proposed Answer: A

Explanation (Optional):

A. Correct. As stated in TR 3.9.4, SFP water temperature shall be $\underline{>}50$°F

B. Incorrect. Plausible because during movement of irradiated fuel assemblies in the Aux Bldg, when one or more fuel assemblies in the AB has decayed < 60 days since being irradiated, the ABVS is required to be operable. The candidate will need to recognize that only one AB Exhaust Fan is required for the ABVS to be operable.

C. Incorrect. Plausible because the AB crane is equipped with two (2) electrical interlocks to prevent movement over the Spent Fuel Racks. The candidate must recognize that no interlocks preclude travel over the Decon Pit.

D. Incorrect. Plausible because the light is on the refueling panel in the SFP area, however it's incorrect because the light is jumpered per the NOTE in RF-301.

Technical Reference(s): TR 3.9.4

Proposed References to be provided to applicants during examination:			None
Learning Objective:	R3601C, 5.02 RRF08C, 4.00		(As available)
Question Source:	Bank #	C300.0252	
	Modified Bank #		(Note changes or attach parent)
	New		
Question History:		Last NRC Exam:	
Question Cognitive Level:	Memory or Fundamental Knowledge	X	
	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41	10	
	55.43		

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	2		
	K/A #	068	AK3.09	
	Importance Rating	3.9		

Knowledge of the reasons for the following responses as they apply to Control Room Evacuation: Transfer the following to local control: charging pumps, charging header flow control valve, PRZR heaters, and boric acid transfer pumps.

RO Question # 40

Which one of the following explains why charging pump control is transferred to local during the performance of ER-FIRE.1, Alternate Shutdown For Control Complex Fire?

Local control -

A. prevents spurious operation of the "A" charging pump due to wire short or open during the fire

B. provides uninterrupted Instrument Air supply for speed control of "A" charging pump

C. allows for adjustment of "A" charging pump minimum speed by the I&C Tech to support RCS cooldown with loss of Instrument Air

D. allows the "A" charging pump to continue to run in case a spurious UV is initiated by the fire

Proposed Answer: A

Explanation (Optional):

A. Correct. Per 10CFR50 Appendix R, "The safe shutdown equipment and systems for each fire area shall be known to be isolated from associated non-safety circuits in the fire area so that hot shorts, open circuits, or shorts to ground in the associated circuits will not prevent operation of the safe shutdown equipment." Per the UFSAR, "In the event of a control room fire that results in evacuation of the control room, safe shutdown capability is provided by a procedure that uses five plant personnel exclusive of the fire brigade and provides for local control of a charging pump..."

B. Incorrect. Plausible because speed control is required during the procedure. Incorrect because Charging Pump Speed Control Backup Air Cylinders provide air for approximately 1 hour.

C. Incorrect. Plausible because the I&/C Tech has actions to perform during ER-FIRE.1 (wire PCV-430 for local operation, wire AOV-296 and AOV-294 for local operation).

Incorrect because this action is not performed.

D. Incorrect. Plausible because when in local the charging pump will not be stripped by an SI signal. The examinee may confuse this with UV trip. Incorrect because the “A” charging pump will still trip on an UV signal and is transferred to local to prevent spurious operation of the pump due to wire short or open during the fire.

Technical Reference(s): AP-CR.1
ER-FIRE.1
UFSAR, Section 9.5.1.4.2,
10CFR50, Appendix R
DA-EE-2000-066

Proposed References to be provided to applicants during examination: None

Learning Objective: RER22C 8.00 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	059 K4.17	
	Importance Rating	2.5*	

Knowledge of MFW design feature(s) and/or interlock(s) which provide for the following: Increased feedwater flow following a reactor trip.

RO Question # 41

- The plant is operating at 100% power when a Reactor Trip occurs.
- 5 seconds later, Tavg is 560ºF and lowering.
- 15 seconds later (20 seconds after reactor trip) Tavg is 552 ºF and lowering.

At 5 seconds after the reactor trip the Feed Regulating Valves (FRVs) will __(1)__; at 20 seconds after the reactor trip the FRVs will __(2)__ .

	(1)	(2)
A.	have a full closed signal	have a full closed signal
B.	have a full closed signal	be modulating to restore SG level
C.	be modulating to restore SG level	have a full closed signal
D.	be modulating to restore SG level	be modulating to restore SG level

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because the FRVs will close on a FWI signal. Incorrect because the applicable FWI signal in this situation is Rx trip with Tavg < 554 ºF, and at the 5 second point, Tavg is still >554 ºF. The second part is correct.

B. Incorrect. Plausible because the examinee may assume steam flow will be significantly reduced and therefore feed flow needs to be significantly reduced. Incorrect because SG shrink requires increased feedwater flow following Rx trip (part 1), and FWI will have occurred at 552ºF in part 2.

C. Correct. Following the reactor trip, feedflow will be at maximum due to S/G level shrink, and open as necessary to restore level. Once Tavg <554°F, FW isolation will occur and the FRVs will close.

D. Incorrect. Plausible because the first part is correct. In the second part, plausible because the examinee may fail to recognize the conditions met for FW isolation. Incorrect because once Tavg <554°F, FW isolation will occur and the FRVs will close.

Technical Reference(s): R4401C

Proposed References to be provided to applicants during examination: None

Learning Objective: R4401C, 3.03 (As available)

Question Source: Bank #
Modified Bank # B035.0009 (Note changes or attach parent)
New

Question History: Last NRC Exam: 2007

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7
55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	040 AK2.02	
	Importance Rating	2.6*	

Knowledge of the interrelations between the Steam Line Rupture and the following: Sensors and detectors.

RO Question # 42

Given the following MCB indications immediately after a large steam break:

- "A" SG pressure PI-468, 469, 482A: 200 psig and lowering
- "B" SG pressure PI-478, 479, 483A: 1050 psig and lowering
- Steam Header pressure PI-484: 100 psig and lowering
- "A" SG steam flow FI-464, 465, 498: 4.6×10^6 lbm/hr
- "B" SG steam flow FI-474, 475, 499: 0.1×10^6 lbm/hr
- Turbine 1st STG pressure PI-485, 486: 75 psig and lowering

All systems functioned as designed.
Which one of the following is the location of the steam break?

A. Between "A" SG and "A" SG flow element

B. Between the "A" SG flow element and "A" MSIV

C. Between the MSIVs and PI-484

D. Between the turbine stop valves and the HP turbine

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because of "A" SG pressure. Incorrect because if the break was located here "A" SG flow would be approximately zero.

B. Correct. “A” SG pressure low with “B” SG pressure high shows separation between SGs, and an auto SI condition on low SG pressure < 514 psig in ‘A’ SG. Since “all systems functioned as designed”, it can be assumed that ‘A’ MSIV is closed due to SI + Hi Steam Flow. With high steam flow indicated and the ‘A’ MSIV closed, the break must be upstream of the ‘A’ MSIV.

C. Incorrect. Plausible because PI-484 indicates a low pressure. Incorrect because if the break was located here the SG pressures would be the same.

D. Incorrect. Plausible because this is the lowest indicated pressure. Incorrect because if the break was located here, both SG pressures would be equal.

Technical Reference(s): REP02C

Proposed References to be provided to applicants during examination: None

Learning Objective: AEP02S, 1.0 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 5

55.43

Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	061 K5.03	
	Importance Rating	2.6	

Knowledge of the operational implications of the following concepts as they apply to the AFW: Pump head effects when control valve is shut.

RO Question # 43

Given the following:

- The crew is responding to a steam break.
- 'A' MDAFW pump is feeding 'A' SG at 200 gpm.
- The CRS has directed you to secure feed to the "A" SG.

As "A" MDAFW pump discharge valve closes, the recirc valve will open at __(1)__ discharge flow, so that the pump head stabilizes at __(2)__ the 200 gpm value.

A. (1) 100 gpm
(2) the same as

B. (1) 100 gpm
(2) a higher value than

C. (1) 80 gpm
(2) the same as

D. (1) 80 gpm
(2) a higher value than

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because the MDAFW recirc valves close at 100 gpm discharge flow, and the TDAFW recirc valve opens at 100 gpm discharge flow. Also, the examinee may believe that the discharge pressure will stabilize at the initial value. Incorrect because the recirc opens at 80 gpm discharge flow, and pump head will stabilize at a higher value when the recirc opens.

B. Incorrect. Plausible because the MDAFW recirc valves close at 100 gpm discharge flow, and the TDAFW recirc valve opens at 100 gpm discharge flow. The second part is correct. Incorrect because the recirc opens at 80 gpm discharge flow.

C. Incorrect. Plausible because the first part is correct. Incorrect because head will not lower to the initial value.

D. Correct. The recirc valve will open at 80 gpm with the pump head at a higher value.

Technical Reference(s): R4201C,
P&ID 33013-1237

Proposed References to be provided to applicants during examination: None

Learning Objective: RSE00S, 3.01 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:
At Ginna, the MDAFW pump discharge valve <u>is</u> the flow control valve.

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	3		
	Group #	3		
	K/A #	G3	2.3.12	
	Importance Rating	3.2		

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.

RO Question # 44

Plant conditions are as follows:

- The reactor is critical and at 2% power.
- A containment entry is underway to look for a leak identified during the startup.
- The operator and RP tech who are looking for the leak have called the control room and informed you they have discovered a Boric Acid leak coming from the reactor cavity area and going into the 'A' sump.
- They have requested permission to enter the reactor cavity area and 'A' sump to determine the extent of the Boric Acid leak.
- The RP tech has the proper radiological and safety instrumentation necessary, and both individuals are wearing the proper dosimetry.

Which of the following is the correct personnel action regarding entry into the areas, in accordance with A-3, Containment Vessel Access Requirements? They may:

A. not enter either of the areas

B. enter the 'A' sump, but NOT the reactor cavity area

C. enter the reactor cavity area, but NOT the 'A' sump

D. enter BOTH areas provided that the RP tech remains with the operator at all times

Proposed Answer: A

Explanation (Optional):

A. Correct. Per A-3, Precaution 3.5, when the reactor is critical, personnel SHALL NOT enter the reactor cavity or 'A' Sump.

B. Incorrect. Plausible if the candidate believes that the excore detector thimbles and radiation doses below the reactor vessel would preclude entry into this area. Incorrect because the procedure prohibits entry into both areas with the reactor at power.

C. Incorrect. Plausible because entry into the reactor cavity might be possible with RP support, but entry into the reactor cavity area is not permitted at power.

D. Incorrect. Plausible because with continuous RP coverage, it lends validity to the possibility of being able to enter either area – but incorrect because this is not procedurally allowed.

Proposed References to be provided to applicants during examination: None

Learning Objective: RAD02C, 1.02

Question Source:	Bank #	X	
	Modified Bank #		(Note changes or attach parent)
	New		

Question History: Last NRC Exam: 2008

Question Cognitive Level:	Memory or Fundamental Knowledge	X
	Comprehension or Analysis	

10 CFR Part 55 Content:	55.41	12
	55.43	

Radiological safety principles and procedures.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	062 K1.04	
	Importance Rating	3.7	

Knowledge of the physical connections and/or cause effect relationships between the ac distribution system and the following systems: Off-site power sources.

RO Question # 45

Given the following plant conditions:

- The plant was at full power.
- Offsite power is in the 50/50 ALTERNATE alignment.
- Circuit 7T tripped.
- The associated DG started and achieved 8 psig jacket water pressure.

Which one of the following describes the status of the safeguard busses?

	(14/18 busses)	(16/17 busses)
A.	Powered by the DG	Powered by offsite power
B.	De-energized	Powered by offsite power
C.	Powered by offsite power	De-energized
D.	Powered by offsite power	Powered by the DG

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because the examinee may confuse 50/50 alternate lineup with 50/50 normal lineup. Also the examinee may not recognize that 8 psig jacket water pressure will prevent the DG from flashing its field. Incorrect because 14/18 will be powered by offsite power and 16/17 will be de-energized.

B. Incorrect. Plausible because the examinee may confuse 50/50 alternate lineup with 50/50 normal lineup. Incorrect because 14/18 will be powered by offsite power and 16/17 will be de-energized.

C. Correct. In the 50/50 alternate alignment offsite power will still be available to busses 14 & 18. Busses 16 &17 will lose offsite power. "B" DG low jacket water pressure (<11 psig) will prevent "B" DG from powering busses 16&17, so they will be de-energized.

D. Incorrect. Plausible because the first part is correct. Incorrect because low jacket water pressure will prevent the DG from flashing its field, and, therefore, it will not power busses 16&17.

Technical Reference(s): P-12

Proposed References to be provided to applicants during examination: None

Learning Objective: R0801C (As available)

Question Source: Bank #

Modified Bank # B062.0008 (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 4

55.43

Secondary coolant and auxiliary systems that affect the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	045 A1.06	
	Importance Rating	3.3	

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MT/G system controls including: Expected response of secondary plant parameters following T/G trip.

RO Question # 46

The plant was at full power when Avg Tavg failed HIGH. The crew responded per the appropriate alarm response. Later a turbine trip occurred.

Which one of the following identifies how the steam dump system responds to this situation?

Steam dump valves will -

A. Snap open at 1060 psig

B. Initially snap open, and then modulate based on Avg Tavg signal and a fixed value of 547 degrees F

C. Modulate open to control steam header pressure at 1050 psig

D. Modulate open based on an error signal between steam header pressure and the controller setpoint

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because this is the snap open setpoint for the ARVs. Incorrect because the Avg Tavg failure required placing steam dump in pressure control mode. Therefore, steam dump valves will modulate open based on an error signal between steam header pressure and the steam dump controller setpoint.

B. Incorrect. Plausible because this is the response if steam dumps were still in temperature control. Incorrect because the Avg Tavg failure required placing steam dump in pressure control mode.

C. Incorrect. Plausible because this is how the ARVs would respond. Incorrect because the Avg Tavg failure required placing steam dump in pressure control mode. Therefore, steam dump valves will modulate open based on an error signal between steam header pressure and the steam dump controller setpoint.

D. Correct. AR-F-15 directs placing steam dump mode selector to manual (pressure control mode). When the turbine trips, this will result in steam dump valves modulating open based on an error signal between steam header pressure and the steam dump controller setpoint.

Technical Reference(s): P-10, AR-F-15

Proposed References to be provided to applicants during examination: None

Learning Objective: R4501C, 2.02 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 4

55.43

Secondary coolant and auxiliary systems that affect the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	063	A3.01	
	Importance Rating	2.7		

Ability to monitor automatic operation of the DC electrical system, including: Meters, annunciators, dials, recorders, and indicating lights.

RO Question # 47

Given the following:

- The plant is at full power.
- Output voltage from Main DC Distribution Panel A failed (breaker failure)

Which one of the following describes: (1) The MCB annunciator response and (2) The operation of Static transfer switch A?

A. (1) E-3, INVERTER TROUBLE is received
(2) Must be manually transferred to the alternate supply transformer

B. (1) E-6, LOSS A INSTR BUS is received
(2) Must be manually transferred to the alternate supply transformer

C. (1) E-3, INVERTER TROUBLE is received.
(2) Automatically transfers to the alternate supply transformer

D. (1) E-6, LOSS A INSTR BUS is received
(2) Automatically transfers to the alternate supply transformer

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because the first part is correct, and the examinee may believe that the static transfer switch must be manually transferred. Incorrect because the static transfer switch will transfer automatically.

B. Incorrect. Plausible because the A inverter supplies the A Instr Bus, and the examinee may believe that the static transfer switch must be manually transferred. Incorrect because the static transfer switch is designed to transfer quickly enough that the Instrument Bus will not be affected, and the static transfer switch will transfer automatically at 108 $\pm$ 2 VDC, prior to the receipt of the E-6 alarm.

C. Correct. E-3 alarms due to various inputs – including low DC input voltage. On the loss of DC supply, the Auto-static transfer switch will transfer to CVT (from MCC-1C) to prevent power loss. Auto transfer setpoint is 108 VDC + 2 VDC, and will transfer without causing the E-6 alarm at 105 VDC.

D. Incorrect. Plausible because the A inverter supplies the A Instr Bus, and the second part is correct. Incorrect because the static transfer switch is designed to transfer quickly enough (within ¼ cycle) that the Instr Bus voltage is not interrupted. Incorrect because the E-6 alarm, with a setpoint of 105 VDC, will not occur.

Technical Reference(s):

- AR-E-3
- R0901C Lesson Plan
- P-12, Electrical System PLS
- CME-38-01-INVTCVTA, Maintenance for INV-CBT-A

Proposed References to be provided to applicants during examination: None

Learning Objective: R0901C, 2.01 (As available)

Question Source: Bank # C063.0067

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:
This satisfies the K/A because the examinee must know the expected response of the DC electrical system in order to monitor that response.

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	1		
	K/A #	054	AA1.03	
	Importance Rating	3.5		

Ability to operate and / or monitor the following as they apply to the Loss of Main Feedwater (MFW): AFW auxiliaries, including oil cooling water supply.

RO Question # 48

Given the following plant conditions:

- The plant was at full power.
- A loss of all AC power has occurred.
- The crew is implementing the actions of ECA-0.0, Loss of All AC Power.
- The crew is concerned about the TDAFW pump oil cooler.

Per ATT-5.2, ATTACHMENT ALTERNATE COOLING TO TDAFW PUMP: (1) What are the two alternate methods of providing TDAFW pump oil cooler cooling, in the order established by the attachment, and (2) what is the basis for the established order of preference?

A. (1) Feed flow from the TDAFW pump's 1st stage, Fire Water
(2) the secondary alternate method depletes cooling source inventory

B. (1) Fire Water, Feed flow from the TDAFW pump's 1st stage
(2) the secondary alternate method depletes cooling source inventory

C. (1) Feed flow from the TDAFW pump's 1st stage, Fire Water
(2) the secondary alternate method reduces TDAFW pump capacity

D. (1) Fire Water, Feed flow from the TDAFW pump's 1st stage
(2) the secondary alternate method reduces TDAFW pump capacity

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because both sources are addressed in the attachment, but because the self-cooling flowpath depletes CST inventory, it is not the preferred method. The second part is incorrect because the Fire Water system represents a very large resource of cooling water for the pump.

B. Correct. Per the attachment, Fire Water is the preferred source since it does not deplete CST inventory. The CAUTION at the beginning of the Self Cooling Alignment portion of the Att.5.2 points out that this method of cooling should be delayed as long as possible to delay the depletion of CST inventory.

C. Incorrect. Plausible because both sources are addressed in the attachment, but because the self-cooling flowpath depletes CST inventory, it is not preferred. The second part is plausible because the examinee might believe that using the Fire Water system as the water source somehow reduces the overall discharge capacity of the TDAFW pump when using this method.

D. Incorrect. The first part is correct - per the attachment, Fire Water is the preferred source since it does not deplete CST inventory. The second part is plausible because while the leakoff flowpath does represent a loss of AFW flow, the amount is negligible compared to the 440 gpm capacity of the TDAFW pump.

Technical Reference(s): ATT-5.2

Proposed References to be provided to applicants during examination: None

Learning Objective: R4201C, 1.10 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 4

55.43

Secondary coolant and auxiliary systems that affect the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	016 K5.01	
	Importance Rating	2.7	

Knowledge of the operational implication of the following concepts as they apply to the NNIS: Separation of control and protection circuits

RO Question # 49

Given the following conditions:

- The plant is at 100% power.
- PT-429 is selected as the input to the Master Pressurizer Pressure controller.
- The Master Pressurizer Pressure controller develops a ground in its control circuitry.

Which one of the following identifies circuits that may be affected by this ground?

A. PRZR Proportional heaters operation and PRESSURIZER HI PRESSURE reactor trip logic

B. PRZR Pressure PI-429 indication and PRESSURIZER LO PRESS SI logic

C. PRZR Proportional heaters operation and PRZR Pressure PI-429 indication

D. PRESSURIZER HI PRESSURE reactor trip logic and PRESSURIZER LO PRESS SI logic

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because the ground may affect heater operation, and the reactor trip is fed from channel 429. Incorrect because electrical isolation will separate the control circuit from the protection circuit, such that protection (Rx trip logic) will not be affected.

B. Incorrect. Plausible because the ground may affect indication, and the SI is fed from channel 429. Incorrect because electrical isolation will separate the control circuit from the protection circuit, such that protection (SI logic) will not be affected.

C. Correct. Electrical isolation prevents feedback effects on protection circuits from control & indication due to grounds, open circuits, short circuits, etc..

D. Incorrect. Plausible because the Rx trip and SI are fed from channel 429. Incorrect because electrical isolation will separate the control circuit from the protection circuit such that protection logic (Rx trip and SI) will not be affected.

Technical Reference(s): R3501C

Proposed References to be provided to applicants during examination: None

Learning Objective: R3501C, 1 09 (As available)

Question Source: Bank #

Modified Bank # C012.0092 (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	E01 EA2.1	
	Importance Rating	3.2	

Ability to determine and interpret the following as they apply to the (Reactor Trip or Safety Injection Rediagnosis): Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

RO Question # 50

From which of the following conditions may the operator enter ES-0.0, Rediagnosis, based on operator judgment?

A. After the immediate operator actions of E-0, Reactor Trip or Safety Injection, have been completed

B. From ES-0.2, Natural Circulation Cooldown, procedure

C. From FR-P.1, Imminent PTS Condition, procedure

D. From E-2, Faulted SG Isolation, procedure

Proposed Answer: D

Explanation (Optional):

A. Incorrect. E-0 must be complete with transition to an optimal recovery procedure to enter ES-0.0. Plausible if examinee confuses completion of immediate actions with completion of the procedure.

B. Incorrect. ES-0.2 is entered with no accident in progress (therefore when SI was not required). Plausible because ES-0.2 is an optimal recovery procedure and SI could be required during its performance. However, one of the requirements for ES-0.0 entry is that an SI is in service or is required.

C. Incorrect. FR-P.1 is a functional restoration procedure, not an optimal recovery procedure. Plausible because SI Pumps would be running upon transition to FR-P.1

D. Correct. From the ES-0.0 Background, rediagnosis only applies to ORGs, not to FRGs. To be in E-2, an SI has occurred and the actions of E-0 have been completed.

Technical Reference(s):	ES-0.0, ES-0.0 Background document, RES00C		

Proposed References to be provided to applicants during examination: None

Learning Objective:	RES00C, 1.02		(As available)
Question Source:	Bank #	B000.0152	
	Modified Bank #		(Note changes or attach parent)
	New		
Question History:		Last NRC Exam:	
Question Cognitive Level:	Memory or Fundamental Knowledge	X	
	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41	10	
	55.43		

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	063	A1.01	
	Importance Rating	2.5		

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

RO Question # 51

A loss of all AC power is in progress.

Which one of the following identifies (1) The proper order of expected MCB alarms as battery capacity is reduced, and (2) How a faster battery discharge rate is indicated on the 'A' and 'B' Battery Amps digital displays on the Control Room Isolation panel?

(J-21, 1A or 1B BATTERY UNDERVOLTAGE)
(J-31, VITAL BATTERY MONITORING SYSTEM)

A. (1) J-21 and then J-31;
(2) A larger positive (+) number

B. (1) J-31 and then J-21;
(2) A larger positive (+) number

C. (1) J-21 and then J-31;
(2) A larger negative (-) number

D. (1) J-31 and then J-21;
(2) A larger negative (-) number

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because the alarms are correct but in the wrong sequence. Incorrect because discharge is indicated by a negative sign.

B. Incorrect. Plausible because the alarm sequence is correct. Incorrect because discharge is indicated by a negative sign.

C. Incorrect. Plausible because one can easily confuse the voltage setpoints for these two alarms and the alarm sequence is incorrect. One can easily confuse if discharge is indicated by a + or – sign, and this indication is correct.

D. Correct. J-31, VITAL BATTERY MONITORING SYSTEM, setpoint for low voltage is 132 VDC; setpoint for J-21, BATTERY UNDERVOLTAGE, is 110 VDC. Battery discharge is indicated by a negative (-) value on the meter, with magnitude proportional to rate.

Technical Reference(s): AR-J-21
AR-J-31
UFSAR 8.3.2.2

Proposed References to be provided to applicants during examination: None

Learning Objective: R0901C, 3.05 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	1		
	K/A #	056	2.4.9	
	Importance Rating	4.2		

Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.

RO Question # 52

Given that the plant is in Cold Shutdown, Mode 5, Loops Not Filled.

Which one of the following describes the intent of ER-RHR.1, RCDT Pump Operation For Core Cooling?

ER-RHR.1 provides guidance to align the RCDT pumps for core cooling in the event -

A. RCS pressure stabilizes above RHR pump shutoff head during a small break LOCA

B. RHR pumps are lost when operating at RCS reduced inventory conditions

C. a secondary heat sink cannot be established following the loss of all AFW

D. CNMT sump B level is not adequate to provide NPSH for RHR pumps

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because, in the case of a SBLOCA, ES-1.3 provides guidance for swapping to cold leg recirc. If that were unsuccessful, the team would go to ECA-1.1. One of the entry conditions for ER-RHR.1 is from ECA-1.1.

B. Correct. Per ER-RHR.1 entry conditions, ER-RHR.1 may be entered from AP-RHR.2, Loss of RHR While Operating at RCS Reduced Inventory Conditions.

C. Incorrect. Plausible because one of the entry conditions is from AP-RHR.1, and one of the last things attempted in AP-RHR.1 is using secondary heat sink to cool the RCS. This involves verifying at least 200 gpm AFW flow available. Incorrect because a loss of all AFW by itself won't result in transition to ER-RHR.1.

D. Incorrect. Plausible because this describes a situation where the team would be going to ECA-1.1 from ES-1.3, and one of the entry conditions for ER-RHR.1 is from ECA-1.1. Incorrect because the procedure does not provide guidance to restore normal lineup.

Technical Reference(s): ER-RHR.1

Proposed References to be provided to applicants during examination: None

Learning Objective: RER13C, 1.01 (As available)

Question Source: Bank # C000.0281

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	064	K2.02	
	Importance Rating	2.8*		

Knowledge of bus power supplies to the following: Fuel oil pumps.

RO Question # 53

While operating at power, bus 14 tripped on overcurrent, resulting in A EDG running unloaded. Subsequently, a loss of offsite power occurred and the B EDG started.

Which one of the following is correct regarding the DGs and their fuel oil transfer pumps (FOTP) for these conditions?

__(1)__ fuel oil transfer pump has power available. With an AO stationed locally, this FOTP can supply __(2)__ EDG(s).

	(1)	(2)
A.	A	BOTH
B.	A	ONLY A
C.	B	BOTH
D.	B	ONLY B

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because Bus 16 will power MCC D which will power MCC J. In general MCC J feeds all of the support equipment for B DG. However, MCC J powers the A diesel start air compressor. One may easily confuse this with the fuel oil transfer pump and think that A fuel oil transfer pump is supplied by MCC J. Incorrect because the A fuel oil transfer pump will not start.

B. Incorrect. Plausible for the same reason as above. Incorrect because both parts are incorrect.

C. Correct. Bus 16 will power MCC D which will power MCC J which will power B fuel oil transfer pump. With an AO stationed locally, B fuel oil transfer pump can be used to supply both DGs.

D. Incorrect. Plausible because the alignment for using B fuel oil transfer pump to fill A day tank doesn't allow filling B day tank simultaneously. The examinee may assume this will require securing one DG. Incorrect because the AO can swap the alignment as necessary to keep both day tanks filled adequately.

Technical Reference(s): P-12, ER-DG.1

Proposed References to be provided to applicants during examination: None

Learning Objective: R0801C, 9.01 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 8

55.43

Components, capacity, and functions of emergency systems.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	3		
	Group #	3		
	K/A #	G3	2.3.11	
	Importance Rating	3.8		

Radiation Control - Ability to control radiation releases.

RO Question # 54

Given the following plant conditions:

- There is a tube rupture in the 'B' S/G
- The crew is performing actions to isolate the ruptured steam generator per E-3, STEAM GENERATOR TUBE RUPTURE
- 'A' S/G MSIV is closed

Which one of the following actions should be performed to stop/reduce the radioactive release in progress, per the Major Action Category isolation steps of E-3?

A. Manually open the 'A' S/G ARV to maintain RCS temperature

B. Adjust 'B' S/G ARV controller to 1050 psig in auto

C. Shut the manual isolation valve for 'B' S/G ARV

D. Place the 'B' S/G ARV controller in manual at 0% demand

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because the candidate might believe he should lower RCS temp (and ruptured S/G pressure) to prevent lifting a ruptured S/G ARV. This action is taken during the Cooldown phase, but is not used to control RCS temperature to prevent lifting the ruptured S/G ARV. With the intact S/G MSIV closed, steam dump is not available and the 'A' ARV should be set to maintain intact S/G pressure in AUTO.

B. Correct. The ruptured S/G ARV is adjusted to its normal setpressure to ensure that the ARV remains operable and opens BEFORE its associated first safety valve opens at 1085 psig.

C. Incorrect. Plausible because candidate might believe it was a conservative action to isolate a ruptured S/G ARV that was lifting normally in response to pressure.

D. Incorrect. Same reasoning as 'C' – the candidate might believe he/she should take action to close a ruptured S/G ARV that was open.

Technical Reference(s): E-3 Background,
EOP Setpoint Document for H.3

Proposed References to be provided to applicants during examination: None

Learning Objective: REP03C 1.02 (As available)

Question Source: Bank # S019.0011

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	073	A2.02
	Importance Rating	2.7	

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

RO Question # 55

The plant is at 100% power with the following conditions:

- RMS channel R-17, Component Cooling Water, drawer display initially read 2.1E03 cpm, then rose rapidly to >1E06, and now reads "EEEEE"
- R-17 drawer WARN and HIGH lights are lit
- 40 gpm letdown orifice valve AOV-200B is in service
- PCV-135, letdown pressure control valve, is 40% open
- Both RCP labyrinth seal D/Ps are 40"

Which of the following (1) indicates the reason for these indications and (2) what procedure(s) would be entered in response to these indications?

A. (1) Detector failure
(2) STP-O-17.2, RAD MONITORS R-11 thru R-18 SOURCE CHECK, ALARM SETPOINT VERIFICATION, AND FUNCTIONAL TEST

B. (1) Detector failure
(2) E-16, RMS PROCESS MONITOR HIGH ACTIVITY

C. (1) RCS in-leakage to CCW system
(2) E-16, RMS PROCESS MONITOR HIGH ACTIVITY

D. (1) RCS in-leakage to CCW system
(2) AP-CCW.1, Leakage Into the CCW Loop

Proposed Answer: B — Accept A & B [initials] 11/9/12

Explanation (Optional):

A. ~~Incorrect. Plausible~~ because the given indications indicate a detector failure high which ~~over-ranged~~ the circuit and activated the WARN and HIGH range alarm circuits in the
Correct [initials] 11/9/12

AF 11/9/12

drawer. Part 2 is plausible because going to the STP-O procedure for checking setpoints and functionality would *eventually* be addressed, but would not be the first procedure entered. Incorrect because the E-16 alarm which accompanies the HIGH alarm is the higher priority procedure which should be entered initially.

B. Correct. The given indications indicate a detector failure high which over-ranged the circuit and activated the WARN and HIGH range alarm circuits in the drawer. The HIGH alarm will close RCV-017, the CCW vent valve (but that information is not provided) and provide an input into the E-16 annunciator. The E-16 Alarm Response procedure will provide further guidance (e.g., verify that automatic actions have occurred).

C. Incorrect. Part 1 is plausible because Warning or High alarm on R-17 is the primary means of detecting in-leakage into the CCW system. Incorrect because the plant parameters provided in the initial conditions indicate that neither the NRHX or thermal barrier HX is leaking. Part 2 is the correct procedure to be entered initially. Incorrect because there is no other information in the stem which indicates that a valid leak into the CCW system is likely.

D. Incorrect. Part 1 is plausible because Warning or High alarm on R-17 is the primary means of detecting in-leakage into the CCW system. Incorrect because the plant parameters provided in the initial conditions indicate that neither the NRHX or thermal barrier HX is leaking. Part 2 is plausible because it's the procedure which E-16 will direct transition to, but given the lack of supporting plant information to confirm a leak into the CCW system, is not the correct procedure to be entered initially.

Technical Reference(s): E-16
STP-O-17.2

Proposed References to be provided to applicants during examination: None

Learning Objective: R3901C, 4.01 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam: 2007

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 11

55.43

Purpose and operation of radiation monitoring systems, including alarms and survey equipment.
Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	1		
	K/A #	057	AK3.01	
	Importance Rating	4.1		

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

RO Question # 56

The crew is restoring power to Instrument Bus D while implementing FR-S.1, Response To Reactor Restart/ATWS.

Which one of the following identifies: (1) Where Instrument Bus D will be powered from, and (2) What the basis is for restoring Instrument Bus D?

A. (1) MCC A or MCC B;
(2) Power the Intermediate Range SUR instrumentation

B. (1) MCC A or MCC B;
(2) Power the Radiation Monitoring instrumentation

C. (1) MCC A or MCC C;
(2) Power the Intermediate Range SUR instrumentation

D. (1) MCC A or MCC C;
(2) Power the Radiation Monitoring instrumentation

Proposed Answer: A

Explanation (Optional):

A. Correct. MCC B is energized to restore IB D to power IR SUR. MCC A is energized because IB D may have been previously aligned to the maintenance supply.

B. Incorrect. Plausible because the first part is correct and the rad monitors are powered from instrument busses. Throughout the EOPs, IBs are re-energized to restore instrumentation. Incorrect because in FR-S.1, we are specifically restoring SUR indication.

C. Incorrect. Plausible because MCC A is correct and MCC C is a power source for both IB A and IB B, which power IR N-35 & N-36. Incorrect because the SUR indication comes from IB D.

D. Incorrect. Plausible because the first part is correct and the rad monitors are powered from instrument busses. Throughout the EOPs, IBs are re-energized to restore instrumentation. Incorrect because in FR-S.1, we are specifically restoring SUR indication.

Technical Reference(s): FR-S.1,
FR-S.1 Background

Proposed References to be provided to applicants during examination: None

Learning Objective: RFRS1C, 1.02 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	076	K1.17	
	Importance Rating	3.6*		

Knowledge of the physical connections and/or cause- effect relationships between the SWS and the following systems: PRMS.

RO Question # 57

Given the following:

- The plant is operating at full power, MOL
- There's a Service Water leak on the weld for TE-6875, Containment Recirc Fan 'A' Motor Cooler Outlet temperature.

Which one of the following accident scenarios could result in a radiation alarm on R-16, CNMT Service Water Radiation Monitor? Assume the CNMT pressure values are not related to the existing SW leak.

A. LOCA with RCS I-131 activity 30μCi/gm and resultant CNMT pressure stable at 58 psig

B. LOCA with RCS I-131 activity 80μCi/gm and resultant CNMT pressure stable at 6 psig

C. MSLB inside CNMT on 'B' S/G with SGTR on 'A' S/G; RCS activity 80μCi/gm and resultant CNMT pressure stable at 6 psig

D. MSLB inside CNMT on 'B' S/G with SGTR on 'A' S/G; RCS activity 30μCi/gm and resultant CNMT pressure stable at 58 psig

Proposed Answer: A

Explanation (Optional):

A. Correct. LOCA which results in 58 psig CNMT pressure will result in in-leakage into the SW system and high rad condition detected by R-16.

B. Incorrect. Plausible because examinee may believe RCS activity value is more significant than the magnitude of the pressure differential between CNMT pressure and SW system pressure. Incorrect because in-leakage cannot occur with only 6 psig in CNMT.

C. Incorrect. Plausible because the MSLB accident is capable of producing sufficient pressure in CNMT for Service Water system in-leakage, but is insufficient in this case. The elevated RCS activity also improves the credibility of the distractor, but the SGTR is on the opposite S/G from the MSLB and little/any CNMT activity will result. Incorrect because in-leakage cannot occur with only 6 psig in CNMT.

D. Incorrect. Plausible because the MSLB accident is capable of producing sufficient pressure in CNMT for Service Water system in-leakage, and is sufficient to do so with 58 psig. The lower value of elevated RCS activity improves the credibility of the distractor, but the SGTR is on the *opposite S/G* from the MSLB and little/any CNMT activity will result. Incorrect because there will be little/any activity from the MSBL to migrate into the SW system.

Technical Reference(s): P-9 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R3901C 1.03 (As available)

Question Source: Bank # C072.0022

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	1		
	K/A #	062	2.4.11	
	Importance Rating	4.0		

Knowledge of abnormal condition procedures, regarding Loss of Service Water.

RO Question # 58

Given the following conditions:

- Offsite power has been lost
- Both D/Gs started and re-energized the emergency busses
- Service water pumps A, B, and C are NOT running.
- Attempts to start service water pumps A, B, and C were unsuccessful
- Service water pump D is running

Which of the following describes the action(s) required per AP-SW.2, Loss of Service Water?

A. Pull-stop ED/G 'A' and immediately depress the voltage shutdown pushbutton. Do not stop ED/G 'B.'

B. Pull-stop ED/G 'B' and immediately depress the voltage shutdown pushbutton. Do not stop ED/G 'A.'

C. Pull-stop both ED/Gs, immediately depress their voltage shutdown pushbuttons, and go to ECA-0.0. Loss of All AC Power.

D. Trip the reactor, perform the immediate actions of E-0, Reactor Trip or Safety Injection, then trip all RCPs.

Proposed Answer: A

Explanation (Optional):

A. Correct. AP-SW.2, Step 2a RNO directs the operator to pull-stop the affected ED/G and immediately depress the voltage shutdown pushbutton if any D/G is running without adequate SW cooling. A & B SW pumps supply the 'A' train components, and C&D SW pumps supply the 'B' train. With only D SW pump running, 'B' train has SW cooling but 'A' does not. Per the AP, the 'A' DG should be secured.

B. Incorrect. Plausible because per the correct explanation above, the D/G in the loop without cooling is 'A' D/G. If the examinee fails to correctly identify which SW pumps feed which cooling trains, the wrong D/G can be secured. Incorrect because 'B' D/G has been secured.

C. Incorrect. Plausible if the examinee believes that one SW pump is inadequate to supply cooling to DGs. Without sufficient cooling, immediately tripping the running DGs and meeting the direct entry conditions for ECA-0.0 (where actions to restore cooling could be contained) is reasonable. Incorrect because a single SW pump can supply cooling to a single DG, and only the 'A' DG should be secured.

D. Incorrect. Plausible if the examinee believes that one SW pump is inadequate to supply cooling to DGs. Without sufficient cooling, immediately tripping the reactor and performing the Immediate Actions of E-0 before securing the RCPs (which have lost the CCW cooling heat sink) is reasonable. Incorrect because a single SW pump can supply cooling to a single DG, and only the 'A' DG should be secured.

Technical Reference(s): AP-SW.2 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank # C000.1344

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	2		
	K/A #	002	K5.08	
	Importance Rating	3.4		

Knowledge of the operational implications of the following concepts as they apply to the RCS: Why PZR level should be kept within the programmed band.

RO Question # 59

Given the following:

- The plant was initially at full power.
- A turbine load reduction equivalent to 50% of rated thermal power at a rate 200% per minute occurred.
- Condenser steam dumps operated properly.
- Automatic rod control was available.

Which one of the following identifies the pressurizer design basis associated with this transient?

A. If PRZR level is 56% at the start of the transient, the RCS pressure rise will be controlled by the PRZR Safeties

B. If PRZR level is 56% at the start of the transient, the PRZR vapor space will remain large enough to maintain pressure throughout the transient

C. The PRESSURIZER HI PRESSURE reactor trip ensures the RCS pressure rise will be controlled by the PRZR Safeties

D. The PRESSURIZER HI PRESSURE reactor trip ensures the PRZR vapor space will remain large enough to maintain pressure throughout the transient

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because 56% is the program PRZR level at full power, and the PRZR Safeties lifting will lower RCS pressure. Incorrect because the system is designed to maintain PRZR pressure and level within the control bands for this transient (opening of the safeties is not part of the control band).

B. Correct. The system is designed to maintain PRZR pressure and level within the control bands for this transient.The upper limit on program level is low enough to ensure there is enough steam volume to provide pressure control.

C. Incorrect. Plausible because RX trip will lower RCS temperature and RCS pressure, and the PRZR Safeties lifting will lower RCS pressure. Incorrect because the system is designed to maintain PRZR pressure and level within the control bands for this transient (Rx trip and opening of the safeties is not part of the control band).

D. Incorrect. Plausible because RX trip will lower RCS temperature and RCS pressure. Incorrect because the system is designed to maintain PRZR pressure and level within the control bands for this transient (Rx trip is not part of the control band).

Technical Reference(s): R1901C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R1901C, 1.04 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 4

55.43

Secondary coolant and auxiliary systems that affect the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	2		
	K/A #	E15	EA1.2	
	Importance Rating	2.7		

Ability to operate and / or monitor the following as they apply to the (Containment Flooding): Operating behavior characteristics of the facility.

RO Question # 60

Following a large break LOCA, the operators are in E-1, Loss of Reactor or Secondary Coolant. The HCO notes that CNMT sump B level indication for 180 inches is illuminated for both trains.

Which one of the following statements is correct regarding the sump level?

A. This indicates the swapover to cold leg recirculation has not occurred. The operators should transition to ES-1.3, Cold Leg Recirculation, and initiate recirculation.

B. This indicates service water leakage into CNMT. The operators will take action per AP-SW.1, Service Water Leak.

C. This indicates unexpected water entering into CNMT. The operators will take action per FR-Z.2, Response to Containment Flooding.

D. This indicates unexpected water entering into CNMT. The operators will monitor level, but take no action until level > 214 inches in sump B.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because a level of 113 inches corresponds to the minimum sump level necessary for recirculation, and that level has been exceeded. Ginna does NOT have automatic cold leg recirculation re-alignment system. Incorrect because the only entry condition for ES-1.3 is based upon RWST level conditions of <28%.

B. Incorrect. Plausible because AP-SW.1 has steps that specifically address the CNMT flooding concern. Incorrect because 180 inches is an entry condition to FR-Z.2.

C. Correct. The basis for 180" in CNMT sump 'B' is based upon the entire contents of the RCS, RWST, CST, and SI accumulators. An indicated level >180" would indicate that water volumes other than those assumed have been introduced into CNMT.

D. Incorrect. Plausible because the first part is correct, and 214 is the highest level indication available from sump B. Incorrect because 180 inches is an entry condition to FR-Z.2.

Technical Reference(s):	FR-Z.2 Background Document, F-0.5	(Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective:	RFRZ2C 2.01	(As available)

Question Source:	Bank #	B000.1057	
	Modified Bank #		(Note changes or attach parent)
	New		

Question History: Last NRC Exam:

Question Cognitive Level:	Memory or Fundamental Knowledge	X
	Comprehension or Analysis	

10 CFR Part 55 Content:	55.41	9
	55.43	

Shielding, isolation, and containment design feature, including access limitations

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	078	A3.01	
	Importance Rating	3.1		

Ability to monitor automatic operation of the IAS, including: Air pressure.

RO Question # 61

The unit is at cold shutdown. The following conditions exist:

- The 'C' Instrument Air Compressor and Service Air Compressor are OOS.
- 'A' and 'B' Instrument Air Compressors are running with local control in 'Constant Speed'
- The Diesel Air Compressor is aligned to service air per T-2F, "Backup Air Supply"

Subsequently the following occurs:

- 'B' Instrument Air Compressor trips
- Instrument air header pressure is 105 psig and slowly lowering.

Assuming no operator action, which one of the following describes the Instrument and Service Air system response?

A. The 'A' instrument air compressor will load at 90 psig and control instrument air header pressure between load and unload setpoints

B. The 'A' instrument air compressor will load at 100 psig and control instrument air header pressure between load and unload setpoints

C. AOV-5251, Service Air Crosstie Valve will open at 90 psig and supply the instrument air header with backup air

D. AOV-5251, Service Air Crosstie Valve will open at 100 psig and supply the instrument air header with backup air

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because crosstie AOV-5251 opens at 90 psig and the examinee may confuse this with the 'A' IAC load setpoint. The 'A' and 'B' compressors in CONSTANT SPEED mode will load at 110 psig and unload at 125 psig. Incorrect because the ‘A’ instrument air compressor by itself will not be able to maintain header pressure >125 psig and will never unload. Constant running will eventually lead to the compressor tripping on high temperature and AOV-5251 opening to supply the IA header with backup air.

B. Incorrect. Plausible because crosstie V-7000A closes at 100 psig and the examinee may confuse this with the ‘A’ IAC load setpoint. Incorrect because the ‘A’ IAC loads at 110 psig.

C. Correct. The single ‘A’ air compressor will not be able to supply instrument air pressure by itself – eventually tripping on high temperature since it’s never able to reach 115 psig to unload. Service Air Crosstie Valve will then open at 90 psig and supply the instrument air header with backup air.

D. Incorrect. Plausible because crosstie V-7000A closes at 100 psig and the examinee may confuse this with crosstie AOV-5251 opening setpoint. Incorrect because AOV-5251 opens at 90 psig.

Technical Reference(s): AP-IA.1 FIG-14.0 R4701C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RAP10C 2.01 R4701C 5.01 (As available)

Question Source: Bank #

Modified Bank # B078.0013 (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	1		
	K/A #	E04	EA2.1	
	Importance Rating	3.4		

Ability to determine and interpret the following as they apply to the (LOCA Outside Containment): Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

RO Question # 62

Given the following conditions:

- A small break LOCA has occurred outside containment
- Actions of ECA-1.2, LOCA Outside Containment, have failed to isolate the break
- RCS pressure is 1440 psig and continues to lower
- PRZR level is 0%
- RWST level is 84% and slowly lowering

Which one of the following identifies: (1) The procedure that will be used upon transition from ECA-1.2, and (2) The basis for the transition?

A. (1) FR-I.2, Response to Low Pressurizer Level
(2) To raise SI flow and RCS inventory

B. (1) E-1, Loss of Reactor Or Secondary Coolant
(2) To continue actions to address the LOCA

C. (1) ES-1.2, Post LOCA Cooldown And Depressurization
(2) To reduce SI flow and conserve makeup inventory

D. (1) ECA-1.1, Loss of Emergency Coolant Recirculation
(2) To address the loss of inventory available for core cooling

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because an offscale low PRZR level causing a Yellow path on FR-I.2 might be seen as a reasonable response, but the caution prior to step 1 in FR-I.2 states "If ECA-1.1, ECA-3.2, or ECA-3.3 is in effect, this procedures should NOT be performed." Incorrect because the RNO actions for step 7 of ECA-1.2 directs that a transition to ECA-1.1 be made.

B. Incorrect. Plausible because E-1 is the alternative procedure that ECA-1.2 uses as a transition at the end of the procedure. Incorrect because RCS pressure continues to lower, which indicates transition to ECA-1.1 is required rather than transition to E-1.

C. Incorrect. Plausible because there is a LOCA in progress and ES-1.2 provides the guidance for dealing with a LOCA. Incorrect because we have a continuing LOCA outside CNMT which means the CNMT sump may not get enough water to support Cold Leg recirc, which requires the transition to ECA-1.1.

D. Correct. With the continuing LOCA outside CNMT, ECA-1.1 will delay depletion of the RWST, and depressurize the RCS to minimize break flow.

Technical Reference(s): ECA-1.2, ECA-1.2 Background (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: REC12C, 1.04 (As available)

Question Source: Bank # C000.1125

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

This is an RO question because lesson plan objective 1.04 requires the student to state the basis for the Major Action Categories. The final Major Action Category for ECA_1.2 is: Check If Break Is Isolated. The basis for this reads; "RCS pressure is monitored to determine if the break has been isolated. A significant increase in RCS pressure indicates the break is isolated and the operator is sent to E-1, LOSS OF REACTOR OR SECONDARY COOLANT. If the break is not isolated, the operator transfers to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, for further recovery actions. Clearly stating the basis includes recognizing the procedure that will be transferred to from ECA-1.2.

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	012	A4.01	
	Importance Rating	4.5		

Ability to manually operate and/or monitor in the control room: Manual trip button. (Regarding Reactor Protection System)

RO Question # 63

Given the following:

- A plant startup is in progress with power at 5%
- Operators are NOT aware that the UV trip coil for RTB "A" is jammed in its current position and will not function if called upon

If an automatic zirconium guide tube trip signal occurs, then in order to open BOTH RTBs, the operator __(1)__, because __(2)__ .

A. (1) Must depress either the manual reactor trip pushbutton or the local 'A' RTB trip button
(2) "A" RTB will still be closed

B. (1) Must depress the manual reactor trip pushbutton; local RTB trip button will not function
(2) "A" RTB will still be closed

C. (1) Will not have to take any further actions
(2) only the shunt coil opened "A" RTB and only the UV coil opened "B" RTB

D. (1) Will not have to take any further actions
(2) only the shunt coil opened "A" RTB and both the shunt and UV coils opened "B" RTB

Proposed Answer: A

Explanation (Optional):

A. Correct. The zirconium guide tube trip is unique in that it utilizes the UV coil trip only. With the "A" RTB mechanically jammed, the UV coil trip from the zirconium guide tube trip signal will not trip the "A" RTB. Depressing the manual reactor trip pushbutton will energize both the "A" and "B" RTB shunt coils, which will open both breakers. The "A" RTB can also be opened by depressing the local trip button at the breaker. The zirconium guide tube trip is enabled only when power is below P-7 setpoint (8%).

B. Incorrect. Plausible because the manual pushbutton will open RTB "A", and the second part is true. Incorrect because the local reactor trip button will also open RTB "A".

C. Incorrect. Plausible because the examinee may believe that the zirconium guide tube trip utilizes both the shunt trip and the UV coil trip. Incorrect because the zirc guide tube trip utilizes UV trip only, therefore RTB "A" would still be closed.

D. Incorrect Plausible because the examinee may believe that the zirconium guide tube trip utilizes the shunt trip only. Incorrect because the zirconium guide tube trip is unique in that it utilizes the UV coil only. Therefore, RTB "A" will not open.

Technical Reference(s): R3501C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R3501C 1.04 (As available)

Question Source: Bank #

Modified Bank # C012.0103 (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	3		
	Group #	3		
	K/A #	G3	2.3.13	
	Importance Rating	3.4		

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

RO Question # 64

Given the following conditions:

- The plant is at 100% power
- A Containment entry is in progress

Which one of the conditions listed below requires the containment to be evacuated?

A. Unexpected R-11, CNMT Vent Particulate, alarm

B. Radio communications with the Control Room becomes unavailable.

C. Swapping Containment Recirc Fans is required

D. Upon entry, it is discovered that area lighting is OFF in the intermediate and basement levels

Proposed Answer: A

Explanation (Optional):

A. Correct. Per A-3, Precautions, Section 3.1: "Control room personnel shall sound the plant evacuation alarm to evacuate containment if degraded conditions are noted such as: increasing RCS leakage, unexpected CNMT radiation monitor alarms, increasing gas/particulate/iodine concentrations, or any other condition which threatens personnel safety."

B. Incorrect. Plausible because one might expect constant communication capability to be a requirement for CNMT entry, but it is not. Loss of radio comms might impact the ability to complete the task, but is not a requirement for containment evacuation.

C. Incorrect. Plausible because one might expect changes in CRFC configurations or other ventilation fan changes to challenge expected airborne activity levels.

D. Incorrect. Plausible because lack of lighting could be a personnel safety concern, but incorrect because this is the expected condition upon entry per A-3.

Technical Reference(s): A-3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RAD02C, 1.01 (As available)

Question Source: Bank #

Modified Bank # B310.0030 (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	103	K3.03	
	Importance Rating	3.7		

Knowledge of the effect that a loss or malfunction of the containment system will have on the following: Loss of containment integrity under refueling operations.

RO Question # 65

Given the following:

- The plant is in mode 6 with fuel movement in progress
- The CNMT Purge System is in service.
- Annunciator L-4, Safeguard DC Failure CI and CVI Logic, alarmed
- The secondary AO reports the "Safeguards DC Failure CI and CVI Logic" lights on SIA1 and SIB1 racks are de-energized

Which ONE of the following explains: (1) The effect this will have on CI and CVI, and (2) Any applicable ITS action?

A. (1) "A" and "B" train Auto and Manual CI and CVI are disabled.
(2) Per LCO 3.6.3, Containment Isolation Boundaries, immediately isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve or closed manual valve

B. (1) "A" and "B" train Auto and Manual CI and CVI are disabled.
(2) Per LCO 3.9.3, Containment Penetration, immediately suspend core alterations and movement of irradiated fuel assemblies within containment

C. (1) "A" and "B" train Auto CI and CVI are disabled. Manual CI and CVI remain available.
(2) Per LCO 3.6.3, Containment Isolation Boundaries, immediately isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve or closed manual valve

D. (1) "A" and "B" train Auto CI and CVI are disabled. Manual CI and CVI remain available.
(2) Per LCO 3.9.3, Containment Penetration, immediately suspend core alterations and movement of irradiated fuel assemblies within containment

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because the first part is correct and the second part is a Mode 1-4 requirement for containment isolation that could easily be interpreted to apply to Mode 6. Incorrect because the second part applies only in Modes 1-4.

B. Correct. Per AR-L-4, this alarm indicates that "A" and "B" train Auto and Manual CI and CVI are disabled. Per ITS 3.9.3 LCO: "Each penetration providing direct access from containment atmosphere to the outside atmosphere shall be either: 1. closed by a manual or automatic isolation valve, blind flange, or equivalent, or 2. capable of being closed by an OPERABLE Containment Ventilation Isolation System." With CVI disabled ITS 3.9.3 actions must be performed: "Immediately suspend core alterations and movement of irradiated fuel assemblies within containment."

C. Incorrect. Plausible because one can easily confuse the Safeguard DC Failure CI and CVI Logic and believe that affects only the auto function. The second part is a Mode1-4 requirement for containment isolation that could easily be interpreted to apply to Mode 6. Incorrect because the second part applies only in Modes 1-4.

D. Incorrect. Plausible because one can easily confuse the Safeguard DC Failure CI and CVI Logic and believe that affects only the auto function. The second part is correct. Incorrect because both auto and manual CI/CVI are affected.

Technical Reference(s): AR-L-4, A-3.3, ITS 3.9.3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R3501C 6.17 RRF02C 5.02 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments: Per O-15.1, Administrative Requirement Checklist For Entry To Mode 6 And Refueling Conditions, CVI instrumentation must be operable (or compensatory actions are taken) per ITS 3.3.5. This includes Annunciator L-4 being extinguished.

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	3		
	Group #	4		
	K/A #	G4	2.4.13	
	Importance Rating	4.0		

Emergency Procedures/Plan - Knowledge of crew roles and responsibilities during EOP usage.

RO Question # 66

The plant was operating at power, when a valid SI signal was received. SI pumps have been secured per the EOP guidance in effect.

Which one of the following describes the proper operation of the secured SI Pumps, if an FR procedure is in progress when the SI Reinitiation criteria of the EOP procedure FOLDOUT page are met?

A. Manually operate SI pumps as necessary if in a yellow, orange, or red path FR.

B. Do not operate the SI pumps, continuous actions on FOLDOUT pages do not apply when in FR procedures.

C. Manually operate SI pumps as necessary if in a yellow or orange FR, but only as directed if in a red path FR.

D. Manually operate SI pumps as necessary if in a yellow path FR, but only as directed if in a red or orange path FR.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible if the candidate believes that FOLDOUT pages are always carried forward. Per A503.1, p24, K.2, foldout pages do not carry forward when a procedure is exited unless preceded by a NOTE stating they are applicable in other procedures.

B. Incorrect. Continuous actions in an EOP still apply if performing the actions of a yellow path FR being performed in parallel with the EOP in effect.

C. Incorrect. As in 'B', continuous actions only apply when implementing yellow path FRs.

D. Correct. Per A503.1, p32, 4.c.(7), "While performing the actions of the yellow path, continuous actions or foldout page items of the EOP in effect are still applicable and shall be monitored by the operator and STA." This is because yellow path procedures can be performed in parallel with the EOP, should the operator decide to implement the yellow path FR.

Technical Reference(s): A-503.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: REP50C 1.14 (As available)

Question Source: Bank # C000.1219

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	103	A4.03	
	Importance Rating	2.7*		

Ability to manually operate and/or monitor in the control room: ESF slave relays. (Regarding CNMT)

RO Question # 67

During performance of ATT-27.0, Attachment Automatic Action Verification, it was recognized that the CHRC FLTR 1A DAMPERS CLOSED status light was lit, and the CHRC FLTR 1C DAMPERS CLOSED status light was extinguished.

The __(1)__ charcoal filter damper is improperly aligned, and this will be corrected by pushing in trip relay plungers in the Relay Room __(2)__ Rack.

	(1)	(2)
A.	1A	RLTR-1
B.	1A	RA-2
C.	1C	RLTR-2
D.	1C	RA-3

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because The first part is correct, and the realignment of the charcoal filters is initiated by the SI signal. Part 2 is plausible because entry into the RLTR-1 and RLTR-2 racks is performed during the ECA-0.0 procedure to re-energize the Source Range detectors. Incorrect because the relay is located in the Aux Relay RA-2.

B. Correct CF1A and CF1C are slave relays that re-align upon an SI signal to place Containment Recirc Fans A and C in recirculation mode, which is the post accident alignment. The examinee must determine the required alignment, and then determine which filter is misaligned. Next the examinee must recall which rack in the Relay Room is the correct rack to perform the manual action.

C. Incorrect. Plausible because the examinee may believe that having the damper closed will achieve the correct alignment, and the realignment of the charcoal filters is initiated by the SI signal. Part 2 is plausible because entry into the RLTR-1 and RLTR-2 racks is performed during the ECA-0.0 procedure to re-energize the Source Range detectors. Incorrect because the A filter is misaligned, and the relay is located in the Aux Relay RA-2.

D. Incorrect. Plausible because the examinee may believe that having the damper closed will achieve the correct alignment, and the second part is the correct cabinet for the 1C damper. Incorrect because the A filter is misaligned.

Technical Reference(s): ATT-27.0 STP-O-2.3.1M (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: REP00C 2.01 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	1		
	K/A #	E11	EA2.2	
	Importance Rating	3.4		

Ability to determine and interpret the following as they apply to the (Loss of Emergency Coolant Recirculation): Adherence to appropriate procedures and operation within the limitations in the facility license and amendments.

RO Question # 68

A NOTE prior to the second SG depressurization step (36) in ECA-1.1, Loss of Emergency Coolant Recirculation, states "The intent of the next step is to depressurize the SGs more slowly, but at a rate that will maintain required RVLIS level."

Which one of the following statements gives the reason for slowly depressurizing the SGs?

A. To prevent accumulator nitrogen from entering the RCS and causing gas binding

B. To avoid exceeding the Tech Spec cooldown or depressurization limit

C. To allow time for the vessel head to cool by ambient losses to minimize the potential for void formation

D. To minimize the rate of accumulator water injection, extending the time for depletion of the accumulator inventory

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because the candidate may believe there will be a certain amount of N2 injection during the depressurization to such a low S/G pressure. The S/G pressure selected (160 psig) is designed to prevent N2 injection.

B. Incorrect. Plausible because the candidate may believe that the primary reason for minimizing the depressurization (and subsequent RCS cooldown) is to prevent challenging the cooldown limit.

C. Incorrect. Plausible because void formation in the vessel head is a concern throughout the EOP network. Incorrect because this is not the basis for the slow depressurization in this procedure.

D. Correct. Slow depressurization minimizes the injection rate of the accumulators, extending the time to their depletion. This prolongs the time that RVLIS level is maintained high enough to keep the core covered.

Technical Reference(s):
- ECA-1.1, Step 36
- ECA-1.1 Background

(Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: REC11C 1.02 (As available)

Question Source: Bank # C000.0785

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41

55.43 10

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	2		
	K/A #	029	A2.01	
	Importance Rating	2.9		

Ability to (a) predict the impacts of the following malfunctions or operations on the Containment Purge System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Maintenance or other activity taking place inside containment.

RO Question # 69

Given the following conditions:

- The plant is in Mode 5
- Containment Purge is in progress with Train 'B' in service
- Containment personnel are ready to install the equipment hatch

Subsequently, the Control Room has been directed to swap the running Containment Purge trains (Secure 'B' Train and start 'A' Train).

Which one of the following describes: (1) IF the Containment Purge System may remain in-service during the equipment hatch installation; and (2) per the applicable procedure, the action taken prior to starting the 'A' Train of Containment Purge to ensure that 'A' exhaust fan starts, but 'A' supply fan remains secured?

A. (1) Yes
(2) Ensure the 'A' Containment Purge Supply Fan breaker on MCC-A is open

B. (1) Yes
(2) Place the control switch at the 'A' Purge Supply Fan breaker in the SECURE position

C. (1) No
(2) Ensure the 'A' Containment Purge Supply Fan breaker on MCC-A is open

D. (1) No
(2) Place the control switch at the 'A' Purge Supply Fan breaker in the SECURE position

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because it is conceivable that all fans (supply and exhaust) trip when the flowpath is isolated. Second part is plausible because this is the method once used to perform this operation before the plant modification for the local switch was made.

B. Incorrect. Plausible because it is conceivable that all fans (supply and exhaust) trip when the flowpath is isolated. Part 2 is correct.

C. Incorrect. Plausible because the first part is correct. Second part is plausible because this is the method once used to perform this operation before the plant modification for the local switch was made.

D. Correct. Since *both* supply and exhaust fans for a given train are operated by a single switch behind the MCB in the control room, in order to operate *only* the exhaust fan, the field breaker on the MCC has to be disabled. In the past, the breaker had to be opened to accomplish this, but to prevent having to open the breaker a local switch was added to the breaker cubicles for the Supply fans. Placing this switch in "SECURE" position prevents the Supply fan breaker from closing when the MCB switch is taken to START. Only a single exhaust fan is operated because this is the minimum configuration to ensure a negative containment pressure with respect to outside pressure.

Technical Reference(s): AR-C-17
S-23.2.2 (Attach if not previously provided)

Proposed References to be provided to applicants during examination:

Learning Objective: RSE00S 3.01
RSE00S 6.06 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.
Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	2		
	K/A #	E16	EA1.1	
	Importance Rating	3.1		

Ability to operate and / or monitor the following as they apply to the (High Containment Radiation): Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

RO Question # 70

Which one of the following is true regarding ADVERSE containment values relating to radiation?

A. Adverse values should not be used until either R-29 or R-30 exceeds 10^6 R/hr

B. Adverse values should not be used until both R-29 and R-30 exceed 10^6 R/hr

C. Return to NORMAL values should be used when CNMT pressure is <4 psig and the integrated radiation dose is verified to be less than 10^6 R/hr

D. Return to NORMAL values should be used when CNMT pressure is <4 psig or the integrated radiation dose is verified to be less than 10^6 R/hr

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because < 10^6 R/hr is the value (in RADS) when integrated dose values less than this will allow a return to normal CNMT parameter values and could be confused with the correct setpoint. Incorrect because the correct setpoint is 10^5 R/hr.

B. Incorrect. Plausible because < 10^6 R/hr is the value (in RADS) when integrated dose values less than this will allow a return to normal CNMT parameter values and could be confused with the correct setpoint. Incorrect also because the logic statement which requires both R-29 and R-30 to read this value is incorrect.

C. Correct. Per A-503.1, if either CNMT pressure exceeds 4 psig or the CNMT radiation exceeds 10^5 R/hr, the operator shall use adverse CNMT values. When CNMT pressure is reduced below 4 psig AND the integrated dose can be verified to be less than 10^6 RADS, the operator may again use normal CNMT values.

D. Incorrect. Plausible because the answer is correct except for the "or" logic stated. Incorrect because BOTH containment pressure and integrated dose requirements must be met before normal containment values can be used again.

Technical Reference(s): A-503.1 (Attach if not previously provided)

Proposed References t be provided to applicants during examination: None

Learning Objective: REP50C 1.01 (As available)

Question Source: Bank # B000.1500

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 11

55.43

Purpose and operation of radiation monitoring systems, including alarms and survey equipment.

Comments:

Correct. Per A-503.1, if either CNMT pressure exceeds 4 psig or the CNMT radiation exceeds 10^5 R/hr, the operator shall use adverse CNMT values. If CNMT radiation exceeded 10^5 R/hr, the integrated dose should be assessed. PPCS data point "RADVCNMT" will start to integrate at 10^5 R/hr on the higher of R-29 or R-30, and will alarm at 10^6 R/hr. If integrated dose can be verified to be less than 10^6 RADS, the operator may again use normal CNMT values.

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	3		
	Group #	4		
	K/A #	G4	2.4.23	
	Importance Rating	3.4		

Emergency Procedures/Plan - Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.

RO Question # 71

While performing Step 2 of ECA-0.0, "Loss of All AC Power", the STA informs you that he has received an orange path on core cooling, and a red path on integrity.

Which one of the following states the correct action to take?

A. Continue with ECA-0.0 while monitoring CSFSTs

B. Continue with ECA-0.0 but do not monitor CSFSTs until directed later in ECA-0.0

C. Immediately transition to FR-C.1, "Response to Inadequate Core Cooling"

D. Immediately transition to FR-P.1 "Response to Imminent Pressurized Thermal Shock"

Proposed Answer: A

Explanation (Optional):

A. Correct. This guideline has priority over all FRGs and is written to implicitly monitor and maintain critical safety functions. This priority is necessary since all FRs assume that at least one AC emergency bus is available.

B. Incorrect. Plausible because candidate might assume that since FRs are not to be initially implemented in ECA-0.0, there might be a point later in the procedure (similar to that in ES-1.3, Transfer to Cold Leg Recirculation, where a NOTE reminds the crew that FR procedures should not be implemented prior to completion of Steps 3-12) where they are directed to resume monitoring.

C. Incorrect. Plausible if the candidate did not recall that FR procedures are NOT to be implemented while in ECA-0.0 unless directed. Since Core Cooling CSF has a higher priority than the Integrity CSF, he might believe transition to FR-C procedure would be appropriate.

D. Incorrect. Plausible if the candidate did not recall that FR procedures are NOT to be implemented while in ECA-0.0 unless directed. Since the Integrity *red* path is a higher priority than the Core Cooling *orange* path, he might believe transition to FR-P procedure would be appropriate.

Technical Reference(s):
- ECA-0.0
- ECA-0.0 Background
- A-503.1

(Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: REC00C 2.01, REC00C 1.05, REP50C 1.29 (As available)

Question Source: Bank # B000.0007

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments: At Ginna, ROs are responsible for knowing the basis of all EOP notes and cautions. In addition, they are expected to know all red path entry conditions from memory

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	E05 EK1.1	
	Importance Rating	3.8	

Knowledge of the operational implications of the following concepts as they apply to the (Loss of Secondary Heat Sink): Components, capacity, and function of emergency systems.

RO Question # 72

Step 2 of FR-H.1, Response to Loss of Secondary Heat Sink, checks both S/G wide range levels less than 120 inches [160 inches adverse CNMT]. If the S/G wide range levels are less than the stated levels, the step directs stopping both RCPs and going to step 13, which initiates RCS bleed and feed.

Which one of the following is the reason an immediate bleed and feed is initiated under these conditions?

A. If bleed and feed is delayed, higher CET temperatures will increase the likelihood of core damage when SI flow is initiated

B. If bleed and feed is delayed PORV's may not remove enough energy to depressurize RCS to less than SI pump shutoff head

C. This ensures sufficient mass exists in the S/Gs to ensure complete dryout of the S/G does not occur during the design basis event duration

D. This ensures sufficient mass exists in the S/Gs to ensure that thermal stress is reduced on the subsequent reinitiation of feed

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because it is reasonable to assume that delay in implementing bleed and feed will result in higher CETs and that cold SI flow could result in thermal shock to the core if uncovered. Incorrect because significant core uncovery is not expected early on in the transient, and the real risk in delaying bleed and feed is a lower initial depressurization when the PORVs are opened, higher RCS pressure, lower SI flow, and higher net inventory losses as a result.

B. Correct. Per the Bleed and Feed analysis in the FR-H.1 background, if action is withheld until the start of period 6(past the bleed & feed criteria), the volumetric generation of steam and the resultant pressurization of the RCS will fully open the

PORVs and will hold them continuously open. The RCS will remain in a high pressure condition until the core uncovers enough to reduce the steam generation rate.

C. Incorrect. There is no "design basis event duration" for this event, and the S/Gs are going to dry out due to the inability to establish feedwater to them. The basis for the setpoint value (13000 lb_m of water) is to provide enough time to successfully initiate bleed and feed.

D. Incorrect. There is no "design basis event duration" for this event, and the S/Gs are going to dry out due to the inability to establish feedwater to them. The basis for the setpoint value (13000 lb_m of water) is to provide enough time to successfully initiate bleed and feed.

Technical Reference(s): FR-H.1 Background, ECP-11-000830, PWROG DW-00-28 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RFRH1C 1.04 (As available)

Question Source: Bank # C000.0597

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	2		
	K/A #	E10	EK1.3	
	Importance Rating	3.3		

Knowledge of the operational implications of the following concepts as they apply to the (Natural Circulation Operations): Annunciators and conditions indicating signals, and remedial actions associated with the Natural Circulation with Steam Void in Vessel with/without RVLIS.

RO Question # 73

Given the following conditions during the performance of ES-0.3, Natural Circulation Cooldown with Steam Void in Vessel:

- There is a steam void in the reactor vessel head
- RCS cooldown and depressurization is in progress
- RVLIS level is currently 83% and slowly lowering as the depressurization progresses

Which one of the following explains (1) the concern for the procedural limit of 81% RVLIS level and (2) how will RVLIS level be raised?

A. (1) RVLIS level and Subcooling are used for SI reinitiation criteria
(2) Energize PRZR heaters

B. (1) RVLIS level and Subcooling are used for SI reinitiation criteria
(2) Raise Letdown flow to lower PRZR level and shift more water inventory into the reactor vessel

C. (1) RVLIS level is used to ensure continuation of natural circulation flow
(2) Energize PRZR heaters

D. (1) RVLIS level is used to ensure continuation of natural circulation flow
(2) Raise Letdown flow to lower PRZR level and shift more water inventory into the reactor vessel

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because RVLIS level is frequently used for SI reinitiation criteria in the EOPs, but Subcooling and PRZR level <5% are used in ES-0.3. Part 2 of the answer is correct.

B. Incorrect. Plausible because RVLIS level is frequently used for SI reinitiation criteria in the EOPs, but Subcooling and PRZR level <5% are used in ES-0.3. The second part is plausible because normally raising letdown flow is how PRZR level is lowered; with a void in the head, raising letdown flow would lower RCS pressure, raise void size, and cause PRZR level to increase.

C. Correct. Per the Background document for Step 9 of ES-0.3, void growth would cause steam to enter the hot legs and reach the top of the U-tubes, disrupting natural circulation. Per Step 8 of ES-0.3, energizing PRZR heaters is the normal method in this procedure for raising pressure.

D. Incorrect. Part 1 is correct per C above, but part 2 is plausible because normally raising letdown flow is how PRZR level is lowered; with a void in the head, raising letdown flow would lower RCS pressure, raise void size, and cause PRZR level to increase.

Technical Reference(s): ES-0.3 Background (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RES03C 2.01 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	2		
	K/A #	086	K4.02	
	Importance Rating	3.0		

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

RO Question # 74

V-5106, Service Air Pressure Control Valve to Fire Water Storage Tank, was inadvertently isolated.

Which one of the following: 1) Explains why annunciator AR-K-31, Fire System Alarm Panel, will energize, and 2) Identifies the first automatic pump start that will occur as Fire Storage Tank pressure lowers?

A. 1) Fire Booster Pump start
2) At 105 psig the Fire Water Booster Pump will start

B. 1) Fire Booster Pump start
2) At 100 psig the Fire Water Booster Pump will start

C. 1) Motor Fire Pump start
2) At 95 psig the Motor Driven Fire Pump will start

D. 1) Motor Fire Pump start
2) At 85 psig the Motor Driven Fire Pump will start

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because one could easily confuse the start of the FBP due to level with starting due to pressure. Incorrect because the FBP starts on low level – not low pressure.

B. Incorrect. Plausible because one could easily confuse the start of the FBP due to level with starting due to pressure. Incorrect because the FBP starts on low level – not low pressure.

C. Correct. The start of the Motor Fire Pump results in annunciator K-31, FIRE SYSTEM ALARM PANEL, when it starts automatically at 95 psig.

D. Incorrect. Plausible because the MFP does start on a lowering pressure, and it will cause K-31 to alarm when it starts. Incorrect because the MFP starts at 95 psig, not 85 psig - 85 psig is the start setpoint for the diesel fire pump.

Technical Reference(s): AR-K-15
AR-K-31 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R5901C 2.07
R5901C 2.09
R5901C 2.13 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	077	AA2.06
	Importance Rating	3.4	

Ability to determine and interpret the following as they apply to Generator Voltage and Electric Grid Disturbances: Generator frequency limitations.

RO Question # 75

The unit is operating at 18% power when the following event occurs:

Frequency on Bus 11A and 11B lowers to 55 HZ.

Which of the following would be the expected positions for the RCP breakers and the Reactor trip breakers?

	RCP Breakers	Reactor Trip Breakers
A.	Open	Open
B.	Open	Shut
C.	Shut	Shut
D.	Shut	Open

Proposed Answer: A

Explanation (Optional):

A. Correct. Per 33013-1353 sheet 4, both the RCPs and the RTBs will get a trip signal when frequency is < 57.7 hz.

B. Incorrect. Both the RCPs and the RTBs will get a trip signal when frequency is < 57.7 hz. Plausible because the examinee must recall that the under-frequency feeds both reactor trip and RCP trip.

C. Incorrect. Both the RCPs and the RTBs will get a trip signal when frequency is < 57.7 hz. Plausible because the examinee must recall that the under-frequency feeds both reactor trip and RCP trip.

D. Incorrect. Both the RCPs and the RTBs will get a trip signal when frequency is < 57.7 hz. Plausible because the examinee must recall that the under-frequency feeds both reactor trip and RCP trip.

Technical Reference(s):	ITS 3.3.1 33013-1353 sheet 4	(Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective:	R3501C, 4.07 R1301C 6.03	(As available)

Question Source:	Bank #	C000.1250	
	Modified Bank #		(Note changes or attach parent)
	New		

Question History: Last NRC Exam:

Question Cognitive Level:	Memory or Fundamental Knowledge	X
	Comprehension or Analysis	

10 CFR Part 55 Content:	55.41	7
	55.43	

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			2
	Group #			1
	K/A #	003	A2.01	
	Importance Rating			3.9

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: Problems with RCP seals, especially rates of seal leak-off.

SRO Question # 76

Given the following:

- A small break LOCA is in progress.
- Upon initiation of the SI, only the "C" SIP started ("A" and "B" SIPs could not be started manually).
- The team is performing ES-1.2, Post LOCA Cooldown and Depressurization.
- The team has just initiated an RCS cooldown per step 8.
- Current plant conditions include:
    - FI-177, HI RNG RCP A SEAL LEAKOFF: 9.2 gpm
    - TI-132, RCP 1A SEAL WTR INLET TEMP: 105^{O}F and rising
    - TI-181, RCP 1A SEAL WTR OUTLET TEMP: 180^{O}F and rising

Which one of the following is correct regarding continued operation of "A" RCP?

A. Immediately trip the "A" RCP per AP-RCP.1 criteria.

B. Secure the "A" RCP within 8 hours per AP-RCP.1 criteria.

C. Continue to ES-1.2 step 12 which applies EOP guidance to stop all but one RCP. Trip the "A" RCP.

D. RCP trip criteria do not apply following initiation of an operator controlled RCS cooldown. Do NOT trip "A" RCP.

Proposed Answer: A

Explanation (Optional):

A. Correct. Annunciator B-17, RCP A No.1 SEAL HI-LO FLOW 5.0 GPM 1.0, will be lit. This is a symptom of AP-RCP.1, RCP Seal Malfunction. AP-RCP.1 actions do not conflict with ES-1.2 actions, so "A" RCP will be stopped per AP-RCP.1 guidance in Step 1.b RNO .

B. Incorrect. Plausible because AP-RCP.1 step 4 secures the RCP within 8 hours if total #1 seal flow is less than 0.8 gpm or greater than 6.0 gpm. Incorrect because step 1 directs tripping the RCP if total #1 seal flow is greater than 8 gpm and seal inlet/outlet temps are rising.

C. Incorrect. Plausible because step 12 does provide this guidance. Incorrect because the RCP should be stopped per the AP guidance as soon as the indications are recognized.

D. Incorrect. Plausible because this is a correct statement regarding EOP RCP trip criteria. This response infers that the examinee will remain in ES-1.2. Incorrect because this is non-EOP RCP trip criteria.

Technical Reference(s): WOG ERG Executive Volume
A-503.1
AP-RCP.1
(Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RES12C, 2.01 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments: SRO must assess plant conditions and then select a procedure or section of a procedure to mitigate, recover, or with which to proceed. Left the step number in the stem of the question to make response C a more attractive response in that it suggests the procedure will address the concern shortly.

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			1
	Group #			1
	K/A #	008	AA2.28	
	Importance Rating			3.9

Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: Safety parameter display system indications.

SRO Question # 77

Given the following:

- The plant was operating at full power when PORV-431C failed open and could not be isolated.
- Upon reactor trip, a loss of offsite power occurred.
- The team is performing ES-1.2, Post LOCA Cooldown and Depressurization.
- As CRS, you have read the caution regarding subcooling and transition to FR-P Integrity procedures.
- The team has just established an RCS cooldown at a rate of 90°F/HR per step 8
- Current plant conditions include:
    - RCS pressure: 800 psig
    - Core Exit T/C 499 °F
    - CNMT pressure 14 psig
- The STA has just announced that Safety Parameter Display System (SPDS) indicates an orange path on INTEGRITY.

The STA must verify the condition of all CSFSTs using __(1)__ . The correct procedural use in this situation is to __(2)__ .

A. (1) Control Room Panel indications
(2) Continue in ES-1.2 until RHR injection and then transition to FR-P.1

B. (1) Control Room Panel indications
(2) Immediately transition to FR-P.1

C. (1) Plant Process Computer System indications
(2) Continue in ES-1.2 until RHR injection and then transition to FR-P.1

D. (1) Plant Process Computer System indications
(2) Immediately transition to FR-P.1

Proposed Answer: A

Explanation (Optional):

A. Correct. Per A-503.1, step 5.3 O, Use of Safety Parameter Display system (SPDS), "The STA will verify the condition of all CSFSTs by use of Control Room Panel indications. Once the condition has been verified, the STA will notify the SM and CRS." Evaluation of the plant conditions using FIG-1.0 indicates that the RCS is at saturation for adverse CNMT conditions. Based on the caution prior to step 8, cooldown to initiate RHR injection should be completed before transition to either FR-P INTEGRITY procedure.

B. Incorrect. Plausible because the first part is correct, and if the examinee fails to recognize adverse CNMT conditions he will determine that the RCS is approximately 5 degrees subcooled. In that case immediate transition to FR-P.1 is required. Incorrect because CNMT adverse conditions exist and the RCS is at saturation. Therefore, the crew must continue in ES-1.2.

C. Incorrect. Plausible because the second part is correct, and CSFST monitoring can be accomplished by a combination of Control Room Panel Indications, SPDS, and PPCS. Incorrect because an orange or red path must be verified using Control Room Panel Indications.

D. Incorrect. Plausible because CSFST monitoring can be accomplished by a combination of Control Room Panel Indications, SPDS, and PPCS, and if the examinee fails to recognize adverse CNMT conditions he will determine that the RCS is approximately 5 degrees subcooled. In that case immediate transition to FR-P.1 is required. Incorrect because an orange or red path must be verified using Control Room Panel Indications, and CNMT adverse conditions exist and the RCS is at saturation. Therefore, the crew must continue in ES-1.2.

Technical Reference(s): A-503.1
ES-1.2
FIG-1.0

(Attach if not previously provided)

Proposed References to be provided to applicants during examination: FIG-1.0, Subcooling

Learning Objective: REP50C, 1.11 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments:
SRO-only due to Clarification Guidance Figure 2, "Knowledge of diagnostic steps and decision points in the EOPs that involve transitions ...", and also "Knowledge of administrative procedures that specify hierarchy, implementation; and/or coordination of plant normal, abnormal, and emergency procedures" Examinee must determine whether to continue in ES-1.2 or immediately transition to FR-P.1. Also, examinee must understand the requirements of the STA identifying and notifying the crew of CSFST results prior to the CRS making a decision based on that notification. Note – Per the EOP background for the caution, the caution addresses the situation where there is no forced or natural circulation, thus the bullet in the stem regarding loss of offsite power.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	002	A2.02
	Importance Rating		4.4

Ability to (a) predict the impacts of the following malfunctions or operations on the RCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of coolant pressure.

SRO Question # 78

Given the following plant conditions:

- The plant is at full power.
- Pressurizer spray valve, PCV-431A, drifted partially open and then became mechanically stuck.
- All available pressurizer heaters are energized, but RCS pressure continues to lower.
- Lowering pressure results in an automatic reactor trip.

Which one of the following (1) identifies the proper procedure used to mitigate the consequences of this malfunction and (2) predicts whether or not the failure will result in SI flow if NO operator actions are taken.

A. (1) A-503.1, Emergency and Abnormal Procedures Users Guide
(2) SI will NOT flow

B. (1) E-0, Reactor Trip or Safety Injection
(2) SI will NOT flow

C. (1) A-503.1, Emergency and Abnormal Procedures Users Guide
(2) SI will flow

D. (1) E-0, Reactor Trip or Safety Injection
(2) SI will flow

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because A-503.1 step 5.3 A 5 states: "Actions are permitted to mitigate or compensate for equipment or controller failures or to isolate leaks. Permitted actions include those actions necessary to take manual control and stabilize the affected parameters, ..." Based on this the HCO is permitted to take manual control of PCV-431A and attempt to stabilize pressure. Incorrect because A-503.1 will not provide guidance that will stop the pressure drop. (The valve is mechanically stuck.). In part 2, the candidate may believe that the SI results in isolation of IA to CNMT and the spray valve going closed. Incorrect because as stated, the spray valve is mechanically stuck open.

B. Incorrect. Plausible because part 1 is the correct procedure (Step 13.d of E-0). In part 2, the candidate may believe that the SI results in isolation of IA to CNMT and the spray valve going closed. Incorrect because as stated, the spray valve is mechanically stuck open.

C. Incorrect. Plausible because A-503.1 step 5.3 A 5 states: "Actions are permitted to mitigate or compensate for equipment or controller failures or to isolate leaks. Permitted actions include those actions necessary to take manual control and stabilize the affected parameters, ..." Based on this the HCO is permitted to take manual control of PCV-431A and attempt to stabilize pressure. Incorrect because A-503.1 will not provide guidance that will stop the pressure drop. (The valve is mechanically stuck.). Part 2 is the correct response (see D).

D. Correct. The first part is correct because Step 13.d of E-0 directs securing the affected RCP if spray valves are not closed. Part 2 is correct because without operator action, continued spray will lower RCS pressure until SI flow occurs.

Technical Reference(s): E-0
A-503.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: REP00C, 2.01 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments:

This question requires the examinee to predict the impacts of a failed open and stuck spray valve on the RCS and based on the prediction, select a section of procedures to mitigate the malfunction. The question requires the examinee to recognize the difference between a failed open spray valve and a stuck spray valve. A-503.1 is a correct answer for a failed open spray valve, but not a stuck spray valve. Also this question requires relatively detailed knowledge of all procedures concerned to be able to determine which ones will provide success and which ones won't.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		1
	K/A #	G1	2.1.39
	Importance Rating		4.3

Conduct of Operations - Knowledge of conservative decision making practices.

SRO Question # 79

During the performance of an EOP, the Shift Manager in the control room thinks that a procedural deviation is required. Per A-503.1, Emergency and Abnormal Operating Procedures Users Guide, a procedure deviation should only be considered when three conditions are met.

Which one of the following is one of the three required conditions per A-503.1?

A. A second licensed SRO has approved the deviation

B. Insufficient time exists to implement the normal procedure change policy

C. The Manager – Operations or General Supervisor – Shift Operations is notified prior to initiating the deviation

D. The proposed alternative course of action will allow operation within the license condition or applicable Technical Specification

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because this is required for actions that depart from the License Condition or a Tech Spec as described in 10CFR50.54(x), which is discussed on the next page of A-503.1. Incorrect because only the SRO with command and control has the authority and responsibility to determine if a procedural deviation is warranted.

B. Correct. Per A-503.1 step 5.3 A.1.b, (the second of the three conditions): "A procedural deviation should only be considered when all 3 of the following conditions are met: as-written procedural guidance is deficient due to current plant or equipment conditions; insufficient time exists to implement the normal procedure change policy; an immediate need exists to prevent or to minimize one or more of the following: injury to personnel, damage to plant equipment, threat to health and safety of the public."

C. Incorrect. Plausible because the Manager – Operations or General Supervisor – Shift Operations is notified of the procedural deviation.(Same page of A-503.1) Incorrect because this notification is performed as soon as possible following the completion of the deviation rather than prior to initiating the deviation.

D. Incorrect. Plausible because this is wording from the requirements for departure from the License Condition or a Tech Spec as described in 10CFR50.54(x) which is discussed on the next page of A-503.1. Incorrect because EOPs in general, and the deviation, may result in actions that are outside Tech Specs.

Technical Reference(s): A-503.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: REP50C 2.02 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41

55.43 3

Facility licensee procedures required to obtain authority for design and operating changes in the facility.

Comments: SRO-only due to knowledge of admin procedures that specify implementation of EOPs.

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			1
	Group #			2
	K/A #	068	2.4.6	
	Importance Rating			4.7

Regarding Control Room Evacuation: Knowledge of EOP mitigation strategies.

SRO Question # 80

During 100% power operations a small fire occurs in the Control Room kitchen. Large quantities of smoke fill the Control Room forcing the operating crew to evacuate.

Assuming the fire is controlled and extinguished in the kitchen area, 1) Which one of the following procedures will the operating crew utilize to establish the proper RCS boron concentration, and 2) What mode will the plant be in at endpoint of this procedure?

A. 1) ER-FIRE.1, Alternate Shutdown for Control Complex Fire;
2) MODE 5

B. 1) ER-FIRE.1, Alternate Shutdown for Control Complex Fire;
2) MODE 3

C. 1) AP-CR.1, Control Room Evacuation;
2) MODE 5

D. 1) AP-CR.1, Control Room Evacuation;
2) MODE 3

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because ER-FIRE.1 would be used if the fire was not controllable, and ends with the plant in mode 5. Incorrect because the fire is controlled and extinguished in the kitchen area. Therefore, AP-CR.1 would be used, and ends in mode 3.

B. Incorrect. Plausible because the correct mode is identified, and ER-FIRE.1 would be used if the fire was not controllable. Incorrect because the fire is controlled and extinguished in the kitchen area. Therefore, AP-CR.1 would be used rather than ER-FIRE.1.

C. Incorrect. Plausible because the correct procedure is identified, and the examinee may mistakenly believe that AP-CR.1 ends with the plant in mode 5. Incorrect because AP-CR.1 ends in mode 3.

D. Correct. The fire is controllable, therefore the team will remain in AP-CR.1, which will end with the plant in mode 3.

Technical Reference(s): AP-CR.1
ER-FIRE.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RAP04C 1.01
RAP04C 2.01
RER22C 2.00
RER22C 10.00 (As available)

Question Source: Bank #

Modified Bank # B000.1068 (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments: SRO-only due to Clarification Guidance Figure 2, "Assessing plant conditions and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed." SRO had to assess that the fire was controllable, therefore the crew remains in AP-CR.1 (vs. ER-FIRE.1) to implement the correct boration method. There are no EOPs which address Control Room Evacuation.

The question asks which procedure will be used to establish proper boron concentration because AP-CR.1 is entered initially regardless of which procedure the examinee ends up in, but the correct procedure must be identified to establish the proper RCS boron concentration.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	004	2.1.23
	Importance Rating		4.4

Regarding CVCS: Ability to perform specific system and integrated plant procedures during all modes of plant operation.

SRO Question # 81

The plant was at 100% power when the following conditions occurred:

- 'A' and 'C' charging pumps are running
- 'B' charging pump is out of service for maintenance
- A-4, REGEN HX LETDOWN OUT HI TEMP 395ºF, is received
- The crew initially entered AP-CVCS.1, CVCS Leak
- AO reports the relief valves on the running charging pumps are lifting
- Charging flow indicator FI-128 has been steadily lowering and now reads 0 gpm
- F-4, PRESSURIZER LEVEL DEVIATION -5 NORMAL +5, is received
- PRZR level is slowly lowering

Which one of the following will (1) provide the procedure used to provide mitigating actions and (2) describes the final reactor shutdown, RCS temperature and pressure conditions (disregard any long-term recovery actions)?

A. (1) AP-CVCS.3, Loss of All Charging Flow
(2) Tavg ~547ºF, RCS pressure ~2235 psig

B. (1) AP-CVCS.3, Loss of All Charging Flow
(2) Tcold ~535ºF, RCS pressure ~1400 psig

C. (1) AP-RCS.1, Reactor Coolant Leak
(2) Tavg ~547ºF, RCS pressure ~2235 psig

D. (1) AP-RCS.1, Reactor Coolant Leak
(2) Tcold ~455ºF, RCS pressure ~1400 psig

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because the first part is correct, and the second part identifies conditions following a plant shutdown. Incorrect because the end-point of AP-CVCS.3

is maintaining Tcold ~535°F and RCS pressure ~1400 psig.

B. Correct. The relief valves on the discharge of the charging pumps are open. As a result, the charging pump discharge pressure is only slightly more than the VCT pressure (i.e., there is no blockage). The charging pumps are recirculating on their relief valves, therefore there is no flow to the RCS. The conditions provided in the question are sufficient for the candidate to recognize that normal charging flow is not available and requires a transition to AP-CVCS.3, Loss of All Charging. The end-point of AP-CVCS.3 is maintaining Tcold ~535°F and RCS pressure ~1400 psig.

C. Incorrect. Plausible because alarm F-4 is one of the symptoms of AP-RCS.1, and AP-RCS.1 directs plant shutdown per O-2.1. This would result in no-load temperature and pressure.

D. Incorrect. Plausible because alarm F-4 is one of the symptoms of AP-RCS.1. The candidate may confuse the cooldown requirement with the one from AP-SG.1, which is Tcold at ~ 455°F. The 1400 psig is the pressure that would be required per AP-CVCS.3. Incorrect because the correct procedure to use is AP-CVCS.3, and the end-point of AP-CVCS.3 is maintaining Tcold ~535°F and RCS pressure ~1400 psig.

Technical Reference(s): AP-CVCS.1 AP-CVCS.3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RAP31C, 2.01 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments: This question requires the examinee to assess plant conditions and select a procedure with which to proceed. AP-CVCS.1 has various transitions and referrals to other procedures. The question also requires the candidate to know the end-point of AP-CVCS.3.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		2
	K/A #	G2	2.2.5
	Importance Rating		3.2

Equipment Control - Knowledge of the process for making design or operating changes to the facility.

SRO Question # 82

Given the following:

- The unit is at 100% power
- A temporary sump pump is being installed in the Screenhouse in direct support of normally scheduled maintenance replacement of the Screenhouse Circ Water Bay sump pumps
- The replacement will be performed under a Work Order and a Temporary Change Package (TCP), and is expected to take less than 60 days.

For the given situation:
(1) Whose approval is required for this temporary change installation in the plant, and
(2) Will a 10CFR50.59 screening be required for this activity?

A. (1) Shift Manager (SM);
(2) 10CFR50.59 screening is NOT required

B. (1) Shift Manager (SM);
(2) 10CFR50.59 screening IS required

C. (1) Installation group supervisor;
(2) 10CFR50.59 screening is NOT required

D. (1) Installation group supervisor;
(2) 10CFR50.59 screening IS required

Proposed Answer: A

Explanation (Optional):

A. Correct. Per CNG-CM-1.01-1004, Section 5.4 (c), the SM will approve the TC. This work activity is not a compensatory measure and is in direct support of a scheduled maintenance activity. Per Step 5.3.F.5, if the TCP is in direct support of maintenance, and in installed for 90 days or less, the 10CFR50.59 screen required by CNG-CM-1.01-1003 may be waived.

B. Incorrect. Plausible because (1) SM approval is correct but (2) the 10CFR50.59 screening can be waived.

C. Incorrect. Plausible because (1) the installation group supervisor is part of the TCP installation process, and (2) the 10CFR50.59 screening is not required.

D. Incorrect. Plausible because (1) the installation group supervisor is part of the TCP installation process, and (2) the screening can be waived.

Technical Reference(s):	CNG-CM-1.01-1004, Temporary Plant Configuration Change Process	(Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source:	Bank #		
	Modified Bank #		(Note changes or attach parent)
	New	X	

Question History: Last NRC Exam: N/A

Question Cognitive Level:	Memory or Fundamental Knowledge	
	Comprehension or Analysis	X

10 CFR Part 55 Content:	55.41	
	55.43	3

Facility licensee procedures required to obtain authority for design and operating changes in the facility

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	029	2.1.20
	Importance Rating		4.6

Regarding ATWS: Ability to interpret and execute procedure steps.

SRO Question # 83

Given the following conditions:

- A valid reactor trip signal occurred with the plant at full power.
- The reactor would not trip and the team transitioned to the appropriate emergency procedure.
- Emergency boration was initiated without an SI signal present.
- Subsequently, an automatic SI signal was received and the reactor is still not tripped.

Which one of the following explains (1) the status of emergency boration and (2) what actions are required?

A. (1) Boration flow is unaffected
(2) In FR-S.1, Response to Reactor Restart/ATWS, boration should continue to obtain adequate shutdown margin

B. (1) Boration flow is unaffected
(2) E-0, Reactor Trip or Safety Injection, requires a manual SI and manual CI; receipt of a subsequent auto SI signal will have no effect

C. (1) Boration flow is affected
(2) Initiate emergency boration flow per E-0, Reactor Trip or Safety Injection

D. (1) Boration flow is affected
(2) If SI flow is not indicated, the emergency boration step must be re-performed per FR-S.1

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because the second part is true. Incorrect because part 1 is incorrect: the SI signal will strip the charging pumps and stop the boration flow.

B. Incorrect. Plausible because subsequent auto SI can be confusing. Incorrect because a manual SI and CI would <u>not</u> have been previously initiated in E-0 prior to transitioning to FR-S.1.

C. Incorrect. Plausible because the first part is correct. Incorrect because E-0 is not the procedure which will re-initiate boration flow: FR-S.1 steps would require to be re-performed.

D. Correct. The SI will strip the charging pumps which will stop the boration flow. Emergency boration flow will be re-established when step 4 of FR-S.1 is performed by a procedural loop.

Technical Reference(s): FR-S.1, FR-S.1 Background (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RFRS1C, 2.01 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments: This question requires the examinee to assess conditions and select an appropriate procedure or section of a procedure with which to proceed. The question goes beyond solely knowing the overall mitigative strategy of FR-S.1 because it requires the examinee to recall where the procedural loops and transitions out of the procedure are located, and what the criteria for those loops/transitions are.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		2
	K/A #	G2	2.2.17
	Importance Rating		3.8

Equipment Control - Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritization, and coordination with the transmission system operator.

SRO Question # 84

At 0800, the plant is at 100% power generating 582 net MW.
Manual EHC control is not available.

At 0830, the RG&E Energy Control Center (ECC) notifies the control room:

- Station 13A Transmission Circuits have tripped
- Grid conditions require a net electric generating restriction of 256 MW within 14 minutes and 145 MW within 29 minutes

The crew begins a power reduction at 4% per minute.
At 0844, the net generation is at 270 MWe net.

Which one of the following describes the required action?

A. Trip the reactor and go to E-0, Reactor Trip or Safety Injection

B. Maintain the current load reduction rate to ensure the 29 minute limit is met

C. Lower VARs to lower generator output current and allow continued operation

D. Trip the turbine and go to AP-TURB.1, Turbine Trip Without Reactor Trip Required

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because at the 14 minute time, 270 MWe net is < the P-9 setpoint of ~279 MW (48% of 582 MW). If examinee incorrectly calculates the MWe value of P-9, O-6.9 directs a reactor trip if >P-9. Incorrect because power is <P-9 and only a turbine trip is required.

B. Incorrect. Plausible because continuing the current 4%/min load reduction rate for another 15 minutes would be more than sufficient to meet the 29 minute restriction. Incorrect because both the 14 minutes AND the 29 minute load restriction values need to be met, and the 14 minutes restriction was not met.

C. Incorrect. Plausible because the O-6.9 procedure directs the lowering of VARs to lower generator output current, but this is not the method used to reduce MW load.

D. Correct. At the 14 minute point, electrical load has NOT been reduced below the requested generation restriction of 256 MWe. Since the reactor is <P-9, O-6.9 directs a turbine trip if <P-9. The MWe equivalent of the 48% P-9 setpoint is 279 MWe. With power <P-9, only a turbine trip is required .

Technical Reference(s): O-6.9
AP-TURB.5 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RSE00S 7.05 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.
Comments: Assess plant conditions and select a procedure

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			1
	Group #			2
	K/A #	E14	EA2.1	
	Importance Rating			3.8

Ability to determine and interpret the following as they apply to (Loss of CTMT Integrity): Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

SRO Question # 85

Given the following plant conditions:

- The plant was in MODE 5 with containment doors open to allow workers to move scaffolding.
- SG nozzle dam installation was in progress in preparation for SG inspection, when the running RHR pump tripped.
- The standby RHR pump would not start.

From the procedures below, which one of the following identifies the procedure(s) to use to respond to the situation?

- AP-RHR.1, Loss Of RHR
- AP-RHR.2, Loss Of RHR While Operating At Reduced Inventory Conditions
- O-1.1B, Establishing Containment Integrity
- O-2.3.1A, Containment Closure Capability Within Two Hours During Reduced Inventory Operation

A. AP-RHR.1 ONLY

B. AP-RHR.1, and O-1.1B

C. AP-RHR.2 ONLY

D. AP-RHR.2, and O-2.3.1A

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because if loop level is > 64 inches AP-RHR.1 would be the correct answer. Incorrect because nozzle dam installation requires the RCS to be at reduced inventory, and, therefore, AP-RHR.2 is the applicable procedure.

B. Incorrect. Plausible because if loop level is > 64 inches AP-RHR.1 would be the correct answer, and O-1.1B is used to establish containment integrity per O-1.1, Plant Heatup From Cold Shutdown To Hot Shutdown (normal operations). Incorrect because nozzle dam installation requires the RCS to be at reduced inventory.O-2.3.1A is the procedure that is used to establish containment closure in this situation.

C. Incorrect. Plausible because the first part is correct, and O-1.1B is used to establish containment integrity per O-1.1, Plant Heatup From Cold Shutdown To Hot Shutdown (normal operations). Incorrect because nozzle dam installation requires the RCS to be at reduced inventory, and, therefore, AP-RHR.2 is the applicable procedure. AP-RHR.2 specifies the use of O-2.3.1A to establish containment closure in this situation.

D. Correct. Nozzle dam installation requires the RCS to be at reduced inventory, and, therefore, AP-RHR.2 is the applicable procedure. AP-RHR.2 specifies the use of O-2.3.1A to establish containment closure in this situation.

Technical Reference(s): AP-RHR.2
O-2.3.1A
O-1.1B
(Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RAP25C 1.02
RAP25C 2.01
(As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments: Assess plant conditions and select a procedure

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			2
	Group #			1
	K/A #	062	A2.08	
	Importance Rating			3.0*

Ability to (a) predict the impacts of the following malfunctions or operations on the ac distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Consequences of exceeding voltage limitations.

SRO Question # 86

Given the following conditions:

- The plant is in a 100/0 electrical lineup on Circuit 767.
- The RG&E Energy Control Center has informed Ginna that the Post-Contingency Low Voltage Alarm (PCLVA) is INOPERABLE.
- The crew is monitoring Attachments 2 thru 6 of O-6.9, Ginna Station Operating Limits for Station 13A Transmission.
- The Operability limits of the attachments CANNOT be maintained

Which one of the following describes the consequences of this condition on the 480V Safeguards busses? Bus voltage will __(1)__ and the crew should __(2)__.

A. (1) remain above the undervoltage setpoint on a contingent loss of offsite power
(2) enter AP-ELEC.2, Safeguard Busses Low Voltage or System Abnormal Frequency and monitor voltage

B. (1) remain above the undervoltage setpoint on a contingent loss of offsite power
(2) per O-6.9, declare offsite power inoperable

C. (1) experience undervoltage condition on a contingent main generator trip
(2) enter AP-ELEC.2, Safeguard Busses Low Voltage or System Abnormal Frequency and monitor voltage

D. (1) experience undervoltage condition on a contingent main generator trip
(2) per O-6.9, declare offsite power inoperable

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Part 1 is plausible if the examinee understands the function of the PCLVA circuit or the required monitoring. It is incorrect because the contingent event is a main generator trip with no loss of offsite power. Part 2 AP-ELEC.2 is a plausible procedure (Safeguards Busses Low Voltage or System Abnormal Frequency) because the low voltage conditions on the busses would meet the entry conditions after a generator trip, but the generator is still connected to the grid.

B. Incorrect. Part 1 is plausible if the examinee mis-understands the function of the PCLVA but incorrect contingent event is a main generator trip with no loss of offsite power. Part 2 is correct as stated in D below..

C. Incorrect. Plausible because if the examinee understands the function of the PCLVA circuit or the required monitoring part bus voltage will be low and this is correct. In part 2 AP-ELECT.2 is a plausible procedure (Safeguards Busses Low Voltage or System Abnormal Frequency) to be used AFTER a generator trip and low voltage condition on the offsite power sources. Incorrect because part 2 is wrong, as explained in D below.

D. Correct. Per O-6.9, the purpose of the Contingency Analysis Low Voltage monitoring and alarm system is to analyze the possible effects of a Ginna main generator trip, concurrent with worst-case accident loading, on a potential under-voltage condition on the 480V safeguards busses IF the main generator should trip. Per O-6.9, with the associated Post-Contingency Low Voltage Alarm (PCLVA) inoperable, offsite power operability must be verified using attachments 2-6 and, if unable to maintain Station 13A voltage above the operability lines in the attachments, to declare offsite power inoperable. AP-ELECT.2 is a plausible procedure (Safeguards Busses Low Voltage or System Abnormal Frequency) to be used AFTER a generator trip and low voltage condition on the offsite power sources.

Technical Reference(s): O-6.9
ER-ELEC.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R0503C 1.06 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments: Knowledge of the basis for the limit (curves) in Attachment 2 is SRO knowledge. Also, assessment of facility conditions and selection of the appropriate procedure is an SRO task.

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			1
	Group #			1
	K/A #	E12	EA2.2	
	Importance Rating			3.9

Ability to determine and interpret the following as they apply to the (Uncontrolled Depressurization of all Steam Generators): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

SRO Question # 87

Under what conditions would transition to E-2, Faulted Steam Generator Isolation, be made from procedure ECA-2.1, Uncontrolled Depressurization Of Both Steam Generators?

A. If an uncontrolled level rise in any S/G occurs

B. If any steam generator pressure rises at any time

C. If any steam generator pressure rises at any time (except while performing SI termination in steps 17 and 18)

D. If RCS pressure is NOT greater than 300 psig [350 psig adverse CNMT]

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because symptoms of a SGTR during performance of ECA-2.1 should prompt a transition to E-3. Incorrect because the transition called for is to E-3 directly and not "via" E-2. Final decision step in E-2 is to determine if a SGTR has occurred and, if so, to transition to E-3.

B. Incorrect. Plausible because this is correct except during the performance of steps 17 and 18.

C. Correct. Per ECA-2.1 foldout page: "IF any S/G pressure rises at any time (except while performing SI termination in Steps 17 and 18), THEN go to E-2, Faulted S/G Isolation, Step 1."

D. Incorrect. Plausible because this is criteria for transition out of ECA-2.1, except that it transitions to E-1, not E-2.

Technical Reference(s): ECA-2.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: REC21C, 1.03 (As available)

Question Source: Bank # B000.0141

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments: Assess plant conditions and select a procedure

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	029	A2.04
	Importance Rating		3.2*

Ability to (a) predict the impacts of the following malfunctions or operations on the Containment Purge System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Health physics sampling of containment atmosphere.

SRO Question # 88

Given the following conditions:

- The plant was in mode 5
- Workers are bringing outage equipment into containment through the equipment hatch
- The portable CAM outside the equipment hatch alarmed
- The RP Tech reported that there was *outward* air flow through the equipment hatch

Which one of the following identifies: (1) Guidance which provides the combinations of Purge fans used to establish a negative pressure in containment, and (2) Per that guidance, which acceptable fan combination will result in INWARD air flow through the equipment hatch?

A. (1) S-23.2.2, Containment Purge Procedure;
(2) 2 Purge Exhaust Fans and 1 Purge Supply Fan running

B. (1) S-23.2.2, Containment Purge Procedure;
(2) 2 Purge Exhaust Fans and no Purge Supply Fan running

C. (1) AR-C-17, CNMT VENT SYSTEM;
(2) 2 Purge Exhaust Fans and 1 Purge Supply Fan running

D. (1) AR-C-17, CNMT VENT SYSTEM;
(2) 2 Purge Exhaust Fans and no Purge Supply Fan running

Proposed Answer: A

Explanation (Optional):

A. Correct. This is one of the two (2) approved fan combinations listed in the S-23.2.2 reference procedure (the other is 1 Purge Exhaust and 0 Purge Supply fans running), and although it is not the one most frequently used in the plant, it is an approved configuration.

B. Incorrect. Plausible because S-23.2.2 contains the acceptable combinations, and the examinee might believe that if 1 Exhaust fan will create a negative pressure, then 2 would be even more effective. Incorrect because while 2 exhaust fans running would create a larger negative pressure, with no supply fan running it could be excessive and this configuration is not one of the two configurations specified in the S-23.2.2 procedure.

C. Incorrect. Plausible because the CNMT Purge Supply and Exhaust fans are part of the equipment addressed by the C-17, Containment Vent System, alarm response, but that 7-page AR does not address equipment configurations. Part 2 is correct. Incorrect because AR-C-17 doesn't provide the acceptable running equipment combinations.

D. Incorrect. Plausible because the CNMT Purge Supply and Exhaust fans are part of the equipment addressed by the C-17, Containment Vent System, alarm response, but that 7-page AR does not address equipment configurations. Part 2 is plausible because while 2 exhaust fans running would create a larger negative pressure, with no supply fan running it could be excessive and this configuration is not one of the two configurations specified in the S-23.2.2 procedure. Incorrect because both parts are wrong.

Technical Reference(s): S-23.2.2
AR-C-17 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R2201C, 5.03 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41

55.43 4

Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.
Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			3
	Group #			3
	K/A #	G3	2.3.4	
	Importance Rating			3.7

Radiation Control - Knowledge of radiation exposure limits under normal or emergency conditions.

SRO Question # 89

Given the following conditions:

- A Site Area Emergency is in progress
- An operator has been determined to be missing, and his last known location was the Auxiliary Building Sub-basement
- The radiation levels in the Auxiliary Building Sub-basement are expected to be very high
- It's assumed that the operator is injured

(1) What is the radiation exposure limit for the search and removal of the operator, and
(2) What procedure provides the limit for this situation?

A. (1) 10 Rem;
(2) EPIP-2.8, Voluntary Acceptance Of Emergency Radiation Exposure

B. (1) 10 Rem;
(2) A-1, Radiation Control Manual

C. (1) 25 Rem;
(2) EPIP-2.8, Voluntary Acceptance Of Emergency Radiation Exposure

D. (1) 25 Rem;
(2) A-1, Radiation Control Manual

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because EPIP-2.8 lists the Facility Protection Limit as 10 Rem and this could easily be confused with the Lifesaving Limit. EPIP-2.8 is the correct procedure.

B. Incorrect. Plausible because EPIP-2.8 lists the Facility Protection Limit as 10 Rem and this could easily be confused with the Lifesaving Limit. A-1 is incorrect. The A-1 procedure provides an overview of the Ginna radiation protection program and provides general guidelines for plant radiation workers, but does not contain emergency exposure limits.

C. Correct. EPIP-2.8, Attachment 3 provides emergency radiation guidance. Per Section B, "For situations requiring personnel to search and remove injured workers or to take action for protection of large populations, dose should be limited to 25 REM."

D. Incorrect. Plausible because 25 Rem is correct, and because the A-1 procedure generally lists all radiation exposure limits. A-1 does discuss a Planned Special Exposure (PSE), but that is different than what is involved in EPIP-2.8.

Technical Reference(s): EPIP-2.8 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RSC02C 1.01 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41

55.43 4

Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	E07	EA2.2
	Importance Rating		3.9

Ability to determine and interpret the following as they apply to (Inadequate Core Cooling): Adherence to appropriate procedures and operation within the limitations in the facilities license and amendments.

SRO Question # 90

A LOCA was in progress with the following plant conditions:

- CNMT pressure 16 psig and rising
- Average CETs 1214 °F
- RCS pressure 1000 psig
- RWST level 74%
- RVLIS 60%
- S/G narrow range levels 30%

The CRS entered the appropriate procedure. During the performance of that procedure he reaches the step that requires the S/Gs to be depressurized from 160 psig to atmospheric pressure.

Which one of the following identifies the procedure the CRS entered, and an action that must be performed immediately before the subsequent S/G depressurization?

A. FR-C.2, Response To Degraded Core Cooling; Stop the RCPs

B. FR-C.1, Response To Inadequate Core Cooling; Stop the RCPs

C. FR-C.2, Response To Degraded Core Cooling; Check SI accumulator discharge valves open

D. FR-C.1, Response To Inadequate Core Cooling; Check SI accumulator discharge valves open

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because the examinee could easily confuse FR-C.1 and FR-C.2

entry criteria. The second part is correct.

B. Correct. Meet FR-C.1 entry criteria. RCPs are stopped immediately before the depressurization to atmospheric pressure.

C. Incorrect. Plausible because the examinee could easily confuse FR-C.1 and FR-C.2 entry criteria. The SI accumulator discharge valves are checked open prior to the first depressurization.

D. Incorrect. Plausible because the correct procedure is identified. Incorrect because the SI accumulator discharge valves are checked open prior to the first depressurization.

Technical Reference(s): FR-C.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: No

Learning Objective: RFRC1C, 1.02
RFRC1C, 2.01 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments: Assess plant conditions and select a procedure

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			2
	Group #			1
	K/A #	064	2.4.9	
	Importance Rating			4.2

Regarding Emergency D/Gs: Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.

SRO Question # 91

The plant is cooling down per O-2.2, Plant Shutdown From Hot Shutdown To Cold Conditions, with the following conditions:

- RCS temperature is 295 °F and lowering
- 'A' CNMT Recirc Fan trips on an apparent overcurrent condition
- Shortly thereafter, a loss of all offsite power occurs
- 'A' D/G trips upon start
- 'B' RHR pump will not start
- An AO is directed to perform ER-DG.1, Restoring D/Gs, for 'A' DG
- The AO reports that he is unable to start 'A' D/G. The next step in his procedure directs the performance of Control Room actions prior to contacting Mechanics and Electricians.

Which one of the following choices describes actions (1) that would be taken per ER-D/G.1; and (2) that will be performed to cool the RCS if current conditions cannot be mitigated.

A. (1) Do NOT initiate SI. Depress the Overcurrent RESET pushbutton (inside MCB).
(2) Use C SBAFW pump to feed 'A' S/G per Attachment C, SBAFW PUMP RESTORATION, and dump steam.

B. (1) Do NOT initiate SI. Depress the Overcurrent RESET pushbutton (inside MCB).
(2) Verify natural circulation. If natural circulation not verified, raise dumping steam.

C. (1) Initiate SI and depress 'A' D/G RESET pushbutton;
(2) Use C SBAFW pump to feed 'A' S/G per Attachment C, SBAFW PUMP RESTORATION, and dump steam.

D. (1) Initiate SI and depress 'A' D/G RESET pushbutton;
(2) Verify natural circulation. If natural circulation not verified, raise dumping steam.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because the Overcurrent RESET pushbutton is depressed in the case on an overcurrent condition on the associated emergency bus. Also, using C SBAFW pump to feed 'A' S/G per Attachment C SBAFW PUMP RESTORATION is an option provided in the ER-FIRE series procedures. Incorrect because if the D/G tripped it will be required to reset it before it will start automatically, and the examinee needs to determine that C SBAFW pump has no power.

B. Incorrect. Plausible because the Overcurrent RESET pushbutton is depressed in the case on an overcurrent condition on the associated emergency bus, and the second part is correct. Incorrect because, per ER-D/G.1, SI is initiated to bypass the diesel electrical interlocks and the D/G RESET pushbutton is depressed.

C. Incorrect. Plausible because the first part is correct, and use of C SBAFW pump to feed 'A' S/G per Attachment C SBAFW PUMP RESTORATION is an option provided in the ER-FIRE series procedures. Incorrect because C SBAFW pump has no power from Bus 14 per the initial conditions.

D. Correct. Per step 6.4.4 of ER-D/G.1, if D/G still cannot be started, then request Control Room to perform the following: 1. Initiate SI to bypass diesel electrical interlocks, 2. Depress D/G A RESET pushbutton, 3. Verify D/G auto start."; and, per AP-RHR.1, two options are provided: 1) Start one RCP and establish condenser steam dump manual control, and 2) Verify natural circulation. If natural circulation not verified raise dumping steam.

Technical Reference(s): ER-DG.1
AP-RHR.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: R0801C 1.06
RAP18C, 2.01 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments: The first part of this two-part question examines the students understanding of a procedure that he has sent the AO to do, and the Control Room actions if the AO is unsuccessful. Those actions are something that will be directed to the board operator by the SRO. This is not an RO task. The second part of the question requires knowledge of the RNO action for steps in the later part of AP-RHR.1. Again this is an SRO task that involves selecting a section of a procedure or an attachment with which to proceed.

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			3
	Group #			3
	K/A #	G3	2.3.6	
	Importance Rating			3.8

Radiation Control - Ability to approve release permits.

SRO Question # 92

The “A” Monitor Tank was sampled at 1700 on Monday and the analysis was completed for subsequent release. An event occurred that is delaying the initiation of the release.

Considering the four times listed below, which of the choices identifies ALL of the times at which the release could be initiated with no restrictions?

1) 1900 Monday
2) 2300 Monday
3) 0400 Tuesday
4) 1700 Tuesday

A. 1 ONLY

B. 1, 2 ONLY

C. 1, 2, 3 ONLY

D. 1, 2, 3, 4

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Although this falls within the 12 hours limit, it does not identify identifies ALL of the times at which the release could be initiated with no restrictions.

B. Incorrect. Although this falls within the 12 hours limit, it does not identify identifies ALL of the times at which the release could be initiated with no restrictions.

C. Correct. Per S-3.4K, the release may be initiated, provided no more than 12 hrs have elapsed since the sample. 1, 2, and 3 are all within 12 hours of the 1700 Monday sample.

D. Incorrect. At time 4 there is a restriction: The release may only be initiated, with chem tech approval, provided the conditions that existed when the permit was made still exist.

Technical Reference(s): CH-700 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RSE00S, 5.04 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41

55.43 4

Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions

Comments: SRO-only justification per Clarification Guidance for SRO-Only Questions, Item II.D, "Process for gaseous/liquid release approvals, i.e., release permits."

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			1
	Group #			1
	K/A #	055	2.1.25	
	Importance Rating			4.2

Ability to interpret reference materials, such as graphs, curves, tables, etc.

SRO Question # 93

Following a loss of all AC power, the following conditions exist:

- S/G A pressure - 615 psig and steady
- S/G B pressure - 623 psig and steady
- RCS Loop A Cold Leg – 491 °F
- RCS Loop B Cold Leg – 493 °F
- RCS Loop A Hot Leg – 510 °F and steady
- RCS Loop B Hot Leg – 511 °F and steady
- Core exit TCs – 515 °F and steady
- RCS pressure - 1200 psig
- PRZR level – 14%
- Containment pressure - 1.0 psig
- Containment radiation - 3.61 mR/hr

The crew is preparing to implement the actions of Step 20 of ECA-0.0, to depressurize SGs, when power is restored to a safeguard bus. Which one of the following states (1) the next recovery procedure you transition to, and (2) why natural circulation is/is not indicated?

A. (1) ECA-0.1, Loss Of All AC Power Recovery Without SI Required;
(2) Natural circulation is indicated. RCS cold leg temperature is at SG saturation temperature for observed SG pressure.

B. (1) ECA-0.1, Loss Of All AC Power Recovery Without SI Required;
(2) Natural circulation is not indicated. The RCS is not subcooled.

C. (1) ECA-0.2, Loss Of All AC Power Recovery With SI Required;
(2) Natural circulation is indicated. RCS cold leg temperature is at SG saturation temperature for observed SG pressure.

D. (1) ECA-0.2, Loss Of All AC Power Recovery With SI Required;
(2) Natural circulation is not indicated. The RCS is not subcooled.

Proposed Answer: A

Explanation (Optional):

A. Correct. The RCS is subcooled, PRZR level is > 10%, and the SI & RHR pumps are in pull stop per step 8. Therefore, the correct transition is to ECA-0.1. Also NC is indicated per ATT-13.0.

B. Incorrect. Plausible because ECA-0.1 is correct, and if the RCS were not subcooled the second part would be correct. Incorrect because the RCS is subcooled.

C. Incorrect. Plausible because ECA-0.2 is correct if PRZR level was <10%, or if adverse CNMT conditions existed, or if the RCS was not subcooled. Incorrect because these conditions do not exist.

D. Incorrect. Plausible because ECA-0.2 is correct if PRZR level was <10%, or if adverse CNMT conditions existed, or if the RCS was not subcooled. Incorrect because these conditions do not exist.

Technical Reference(s): ATT-13.0
FIG-1.0
ECA-0.0 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: ATT-13.0
FIG-1.0
Steam Tables

Learning Objective: REC00C, 2.01
REC00S, 1.03 (As available)

Question Source: Bank #

Modified Bank # B000.0040 (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments: (1) Assess plant conditions, select procedure, (2) Interpret reference mat'ls

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		4
	K/A #	G4	2.4.18
	Importance Rating		4.0

Emergency Procedures/Plan - Knowledge of the specific bases for EOPs.

SRO Question # 94

Given the following plant conditions:

- A SGTR is in progress
- The cooldown to establish subcooling has been completed
- PORV-430 was opened to minimize break flow and refill the PRZR
- When the criteria to close PORV-430 was met, both PORV-430 and MOV-516 would not close

Following the required procedure transition, the CRS eventually reached the following CAUTION:

FEED FLOW SHOULD NOT BE ESTABLISHED TO ANY RUPTURED S/G WHICH IS ALSO FAULTED UNLESS IT IS NEEDED FOR RCS COOLDOWN.

Which one of the following identifies:
(1) The procedure that the CRS transitioned to, and
(2) The basis for the caution?

A. (1) ECA-3.1, SGTR With Loss Of Reactor Coolant – Subcooled Recovery Desired
(2) Prevent exacerbating the RCS cooldown by feeding a faulted steam generator

B. (1) ECA-3.1, SGTR With Loss Of Reactor Coolant – Subcooled Recovery Desired
(2) Minimize the potential for thermal shock of the S/G tubes

C. (1) ECA-3.3, SGTR Without Pressurizer Pressure Control
(2) Prevent exacerbating the RCS cooldown by feeding a faulted steam generator

D. (1) ECA-3.3, SGTR Without Pressurizer Pressure Control
(2) Minimize the potential for thermal shock of the S/G tubes

Proposed Answer: A

Explanation (Optional):

A. Correct. Per E-3 step 20, the team will close the block valve for the PORV, if pressure continues to lower check for PORV leakage, and go to ECA-3.1. Per the background document for ECA-3.1the basis for the caution states: “Feeding such a S/G may aggravate an uncontrolled cooldown of the RCS and may increase the possibility of S/G overfill.”

B. Incorrect. Plausible because the correct procedure is identified, and thermal shock is a concern in the situation where a S/G fault has caused the S/G to go dry. Incorrect because the basis is to prevent excessive RCS cooldown due to feeding a faulted S/G

C. Incorrect. Plausible because with the PORV open the team will not have PRZR pressure control, and the second part is correct. Incorrect because ECA-3.1 is the correct transition.

D. Incorrect. Plausible because with the PORV open the team will not have PRZR pressure control, and thermal shock is a concern in the situation where a S/G fault has caused the S/G to go dry. Incorrect because the basis is to prevent excessive RCS cooldown due to feeding a faulted S/G, and ECA-3.1 is the correct transition.

Technical Reference(s): E-3
ECA-3.1 Background (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: REP03C, 2.01
REC31C, 1.02 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments: (1) Assess plant conditions, select procedure, (2) Interpret reference mat'ls

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	076	2.2.25
	Importance Rating		4.2

Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.

SRO Question # 95

Technical Specification 3.4.16 places a limit on maximum RCS gross specific activity. If this limit is exceeded, RCS Tavg must be reduced to less than __(1)__ °F within 8 hours. The basis of the temperature reduction is to __(2)__ .

	(1)	(2)
A.	540	Protect the public against the potential radioactive release from a steam generator tube rupture
B.	540	Limit the radiological consequences of a DBA LOCA
C.	500	Protect the public against the potential radioactive release from a steam generator tube rupture
D.	500	Limit the radiological consequences of a DBA LOCA

Proposed Answer: C

Explanation (Optional):

A. Incorrect. First part is plausible because Plausible because the second part is correct,

B. Incorrect. Plausible because 7 days is the Iodine-131 specific activity time limit Incorrect because the SGTR accident results in an offsite radioactivity dose consequence.

C. Correct. ITS 3.4.16 requires RCS Tavg to be reduced to 500°F within 8 hours to protect the public against the potential radioactive release from a steam generator tube rupture. (Basis for action B.1)

D. Incorrect. Plausible because the first part is correct. Part 2 is incorrect because the SGTR accident results in an offsite radioactivity dose consequence.

Technical Reference(s): ITS B 3.4.16 (Attach if not previously provided)

ITS B 3.7.14

Proposed References to be provided to applicants during examination: None

Learning Objective:	RCH02C, 3.03		(As available)
Question Source:	Bank #		
	Modified Bank #	C300.0263	(Note changes or attach parent)
	New		
Question History:		Last NRC Exam:	
Question Cognitive Level:	Memory or Fundamental Knowledge		X
	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41		
	55.43	2	

Facility operating limitations in the technical specifications and their bases.

Comments: SRO only because the question requires identification of the completion time for the required actions, and knowledge of the TS basis.

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			2
	Group #			1
	K/A #	073	A2.03	
	Importance Rating			2.9*

Ability to (a) predict the impacts of the following malfunctions or operations on the PRM system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Calibration drift.

SRO Question # 96

Which one of the following identifies:
(1) A possible result of calibration drift of R-47, Air Ejector Monitor, and
(2) The appropriate procedure(s) from those listed below to address this condition?

(NOTE:

- STP-O-17.5M, Source Check of High Range Effluent Monitors RM-12A, RM14A, R-31, R-32, R-47, R-48;
- ITS 3.4.15, RCS Leakage Detection Instrumentation)

A. (1) High Voltage reading being outside its limit compared to the Tape Value posted on the drawer;
(2) STP-O-17.5M, and ITS 3.4.15

B. (1) High Voltage reading being outside its limit compared to the Tape Value posted on the drawer;
(2) STP-O-17.5M

C. (1) Warning Alarm and High Alarm setpoints below their required values;
(2) STP-O-17.5M, and ITS 3.4.15

D. (1) Warning Alarm and High Alarm setpoints below their required values;
(2) STP-O-17.5M

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because the first part is correct, and STP-O-17.5M is correct. Incorrect because ITS 3.4.15 is not correct, but plausible if the examinee believes R-47 to be part of the instrumentation associated with this ITS.

B. Correct. Step 6.5.5 of STP-O-17.5M verifies that the High Voltage reading is within +/- 60 VDC of the tape value, and provides the required actions if it is not.

C. Incorrect. Plausible because these are setpoints that are checked by the STP. Incorrect because calibration drift affects the process signal, not the warning setpoints that are set at the drawer by the operator. Incorrect because R-47 is not part of the instrumentation associated with ITS 3.4.15

D. Incorrect. Plausible because these are setpoints that are checked by the STP. Incorrect because calibration drift affects the process signal, not the warning setpoints that are set at the drawer by the operator.

Technical Reference(s): STP-O-17.5M (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RAP32C, 2.01 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments: This question is SRO Only because it requires the examinee to assess facility conditions and select the appropriate procedure.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	058	2.4.20
	Importance Rating		4.3

Regarding a loss of DC Power: Knowledge of the operational implications of EOP warnings, cautions, and notes.

SRO Question # 97

The plant has experienced a loss of vital DC Bus A.

Bus 11A control power __(1)__ automatically transfer to DC Bus B; and __(2)__ will identify the equipment affected when specific DC breakers are de-energized.

(P-11, Electrical Distribution Panel Reference Manual Main Control Board DC,
P-12, Electrical Systems Precautions, Limitations, And Setpoints)

	(1)	(2)
A.	will	P-11
B.	will	P-12
C.	will not	P-11
D.	will not	P-12

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because the 480 VAC control power will automatically transfer to the B DC Bus, and the second part is correct. Incorrect because the 4160VAC busses do not automatically transfer, their control power must be swapped locally at the breaker.

B. Incorrect. Plausible because the 480 VAC control power will automatically transfer to the B DC Bus, and P-12 provides precautions, limitations, and setpoints for plant electrical systems, including 41 attachments that provides loads, distribution drawings, etc. Incorrect because the 4160VAC busses do not automatically transfer, their control power must be swapped locally at the breaker, and P-12 does not provide any information regarding loss of DC power.

C. Correct. The 4160VAC busses do not automatically transfer, their control power must be swapped locally at the breaker. P-11 will provide the equipment affected when specific DC breakers are de-energized.

D. Incorrect. Plausible because the first part is correct, and P-12 provides precautions, limitations, and setpoints for plant electrical systems, including 41 attachments that provides loads, distribution drawings, etc.

Technical Reference(s): ER-ELEC.2
P-11
03202-0102 (Attach if not previously provided)

Proposed References to be provided to applicants during examination:

Learning Objective: RER07C 1.03
RER07C 2.01 (As available)

Question Source: Bank #

Modified Bank # C063.0046 (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments: The question is a match to the K/A, even though it doesn't address an EOP, because it is testing knowledge of a precaution in ER-ELEC.2, Recovery from Loss of A or B DC Train, which is the Ginna emergency procedure for responding to a DC train malfunction.

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			2
	Group #			2
	K/A #	056	2.1.32	
	Importance Rating			4.0

Regarding the Condensate sys: Ability to explain and apply system limits and precautions.

SRO Question # 98

The plant was at full power. The crew implemented AP-RCS.1, Reactor Coolant Leak, to respond to an RCS leak. The time is 1200 when Plant Management directs that the plant be taken off-line by 1630.

Per the applicable load reduction procedure, there is a caution regarding running two condensate pumps at less than 30% power.

(1) Which one of the following identifies the procedure that will be used for the load reduction, and (2) what is the basis for the caution?

A. (1) O-2.1, Normal Shutdown To Hot Shutdown;
(2) Running two condensate pumps at < 30% power has caused the reject valve to open in automatic, resulting in a significant reduction in condensate pressure and NPSH concerns for the running MFP.

B. (1) O-2.1, Normal Shutdown To Hot Shutdown;
(2) Running two condensate pumps at < 30% power has caused dead-heading of one condensate pump with subsequent overheating and cavitation.

C. (1) AP-TURB.5, Rapid Load Reduction;
(2) Running two condensate pumps at < 30% power has caused the reject valve to open in automatic, resulting in a significant reduction in condensate pressure and NPSH concerns for the running MFP.

D. (1) AP-TURB.5, Rapid Load Reduction;
(2) Running two condensate pumps at < 30% power has caused deadheading of one condensate pump with subsequent overheating and cavitation.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible because O-2.1 is provided as the other option for the load reduction in the AP-RCS.1 procedure. Also the reject valve is plausible because there is a caution regarding the reject valve operation during the load reduction. Incorrect because the maximum allowed load reduction rate allowed in O-2.1 is 20% per hour.

AP-TURB.5 is required to reduce power quickly enough for the time allowed, and running two condensate pumps at < 30% power is based on the deadheading concern.

B. Incorrect. Plausible because the second part is correct, and O-2.1 is provided as the other option for the load reduction in the AP-RCS.1 procedure. Incorrect because the maximum allowed load reduction rate allowed in O-2.1 is 20% per hour. AP-TURB.5 is required to reduce power quickly enough for the time allowed.

C. Incorrect. Plausible because AP-TURB.5 is the correct procedure to use, and there is a caution regarding the reject valve operation during the load reduction. Incorrect because running two condensate pumps at < 30% power is based on the deadheading concern.

D. Correct. To reduce power enough in the time allotted, AP-TURB.5 must be used, and running two condensate pumps at < 30% power is based on the deadheading concern.

Technical Reference(s): AP-TURB.5 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RAP30C 1.01 RAP30C 1.03 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments: Question requires the examinee to assess plant conditions and select a procedure with which to proceed. The question also requires the examinee to explain the basis for a condensate system precaution. The times provided result in a load reduction rate that is slightly greater than that allowed by O-2.1. If the examinee mistakes the O-2.1 limit as 25% versus the 20%, O-2.1 would be the correct answer.

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			3
	Group #			4
	K/A #	G4	2.4.29	
	Importance Rating			4.4

Emergency Procedures / Plan - Knowledge of the emergency plan.

SRO Question # 99

The TSC is being manned during a Site Emergency condition when the control room receives word that radiation levels in the TSC are approximately 75 mrem per hour.

Which one of the following identifies (1) the applicable procedure, and (2) the action the acting Emergency Coordinator (Shift Manager) should take?

(NOTE: "Appropriate TSC personnel' includes: Operations Assessment Manager, Chemistry Manager, TSC Director/Emergency Coordinator, Technical Assessment Manager, and Nuclear Assessment.)

A. (1) EPIP 1-9, Technical Support Center Activation;
(2) Have appropriate TSC personnel report to the Shift Manager's office and all other TSC personnel report to the Emergency Offsite Facility (EOF)

B. (1) EPIP 1-9, Technical Support Center Activation;
(2) Have appropriate TSC personnel report to the Shift Manager's office and all other TSC personnel report to the Training Center

C. (1) EPIP 2-10, In-plant Radiation Surveys;
(2) Have appropriate TSC personnel report to the Shift Manager's office and all other TSC personnel report to the Emergency Offsite Facility (EOF)

D. (1) EPIP 2-10, In-plant Radiation Surveys;
(2) Have appropriate TSC personnel report to the Shift Manager's office and all other TSC personnel report to the Training Center

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible because EPIP 1-9 is the correct procedure, and the appropriate TSC personnel report to the Shift Manager's office. Additionally, the EOF is located far enough away that the radiation level would no longer be a concern. Incorrect because, per EPIP 1-9, all other TSC personnel report to the Training Center.

B. Correct. Per EPIP 1-9, TSC personnel will report to the Shift Manager's office and all other TSC personnel report to the Training Center.

C. Incorrect. Plausible because EPIP 2-10 provides the guidelines for conduct of in-plant radiation survey and monitoring, and one might easily assume that includes the guidance for when the measured radiation level is too high. Incorrect because EPIP 1-9 actually contains this information.

D. Incorrect. Plausible because EPIP 2-10 provides the guidelines for conduct of in-plant radiation survey and monitoring, and one might easily assume that includes the guidance for when the measured radiation level is too high. Also, the second part is correct. Incorrect because EPIP 1-9 actually contains the desired information.

Technical Reference(s): EPIP 1-9 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: RSC03C, 1.00 (As available)

Question Source: Bank #

Modified Bank # B000.0219 (Note changes or attach parent)

New

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 4, 5

Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations

Comments: Assess plant conditions, select procedure with which to proceed.

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			1
	Group #			1
	K/A #	065	AA2.07	
	Importance Rating			3.2*

Ability to determine and interpret the following as they apply to the Loss of Instrument Air: Whether backup nitrogen supply is controlling valve position.

SRO Question # 100

Given the following:

- The team is responding to a SGTR.
- Upon transition from E-0, Reactor Trip or Safety Injection, to E-3, Steam Generator Tube Rupture, a loss of offsite power occurred.
- RCS cooldown has been completed with the following plant conditions:
  - Containment pressure: 1.2 psig
  - PRZR level: Below narrow range indication
  - Ruptured SG pressure: 1030 psig
  - RCS pressure: 1400 psig

Which one of the following identifies how the subsequent RCS depressurization will be performed?

A. Using instrument air, open one PORV until RCS pressure is less than ruptured SG pressure and PRZR level is greater than 10%

B. Using instrument air, open one PORV until RCS pressure is less than ruptured SG pressure and PRZR level is greater than 30%

C. Align nitrogen to one PORV per ATT-12.0, ATTACHMENT N2 PORVS, and open that PORV until RCS pressure is less than ruptured SG pressure and PRZR level is greater than 10%

D. Align nitrogen to one PORV per ATT-12.0, ATTACHMENT N2 PORVS, and open that PORV until RCS pressure is less than ruptured SG pressure and PRZR level is greater than 30%

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because the second part (termination criteria) is correct, and the use of instrument air to the PORV is provided as an alternative before the option of using nitrogen. Step 14 of E-3 restores instrument air to CNMT if adequate air compressors are running. Incorrect because with the loss of offsite power adequate air compressors will not be running, so instrument air will not be re-established to CNMT when the depressurization step is reached. Therefore, one PORV with nitrogen will be used.

B. Incorrect. Plausible because the use of instrument air to the PORV is provided as an alternative before the option of using nitrogen. Step 14 of E-3 restores instrument air to CNMT if adequate air compressors are running. Also 30% PRZR level would be the criteria if adverse CNMT conditions existed. Incorrect because with the loss of offsite power adequate air compressors will not be running, so instrument air will not be re-established to CNMT when the depressurization step is reached. Therefore, one PORV with nitrogen will be used. Also, adverse CNMT conditions do not exist, so the correct criteria for stopping the depressurization is 10% PRZR level.

C. Correct. With instrument air in CNMT unavailable, E-3 directs the alignment of nitrogen to the PORV per attachment-12.0. With normal CNMT conditions, the RCS will be depressurized until RCS pressure is less than ruptured SG pressure and PRZR level is greater than 10%.

D. Incorrect. Plausible because the response is correct except for the PRZR level. Incorrect because with normal CNMT conditions the RCS will be depressurized until RCS pressure is less than ruptured SG pressure and PRZR level is greater than 10%.

Technical Reference(s): E-3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: REP03C 2.01 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments: This is an SRO Only question because it requires knowledge of when to implement attachments, including how to coordinate them with procedure steps. The examinee requires SRO knowledge of the E-3 procedure to recognize that with the loss of offsite power, instrument air to CNMT will not be reset even though there is a step that would do this if adequate air compressors were available. This will use of nitrogen to the PORV. Additionally, the examinee must recognize that normal CNMT conditions exist, and that this results in 10% PRZR level criteria rather than the 30% criteria that would be used if adverse CNMT conditions existed.

GINNA 2012 EXAM – SENIOR REACTOR OPERATOR WRITTEN EXAM KEY

1.	D	33.	C	65.	B	97.	C
2.	C	34.	B	66.	D	98.	D
3.	A	35.	B	67.	B	99.	B
4.	A	36.	B	68.	D	100.	C
5.	A	37.	B	69.	D		
6.	A	38.	B	70.	C		
7.	A	39.	A	71.	A		
8.	D	40.	A	72.	B		
9.	C	41.	C	73.	C		
10.	B	42.	B	74.	C		
11.	B	43.	D	75.	A		
12.	D	44.	A	76.	A		
13.	D	45.	C	77.	A		
14.	C	46.	D	78.	D		
15.	B	47.	C	79.	B		
16.	A	48.	B	80.	D		
17.	D	49.	C	81.	B		
18.	B	50.	D	82.	A		
19.	C	51.	D	83.	D		
20.	C	52.	B	84.	D		
21.	D	53.	C	85.	D		
22.	B	54.	B	86.	D		
23.	D	55.	**B or A**	87.	C		
24.	C	56.	A	88.	A		
25.	D	57.	A	89.	C		
26.	B	58.	A	90.	B		
27.	A	59.	B	91.	D		
28.	D	60.	C	92.	C		
29.	D	61.	C	93.	A		
30.	C	62.	D	94.	A		
31.	D	63.	A	95.	C		
32.	A	64.	A	96.	B		