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

Applicant Information	
Name:	
Date:	Facility/Unit V.C. Summer
Region: I ☐ II ☒ III ☐ IV ☐	Reactor Type: W ☒ CE ☐ BW ☐ GE ☐
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 percent overall, with 70 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 percent to pass. You have 9 hours to complete the combined examination and 3 hours if you are only taking the SRO-only 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

1.

Given the following plant conditions:

Time 0700:

- A reactor trip has occurred.
- Pressurizer pressure is 1800 psig and decreasing.
- RHR pumps “A” and “B” switches are in NORMAL AFTER STOP.

Time 0707:

- EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION is in progress.
- Attachment 3, SI EQUIPMENT VERIFICATION is in progress.
- The “B” Diesel Generator tripped immediately after start.
- RHR pump “A” switch was just taken to NORMAL AFTER START.
- RHR pump “B” indications are as follows:
  - Amp meter reads 0 AMPS.
  - Green light is lit.
  - Red light is off.

Which ONE of the choices below completes the following statements?

The “A” RHR Pump got its **first** start signal at time ___(1)___.

In accordance with Attachment 3, the BOP ___(2)___ required to start the “B” RHR pump in the conditions above.

A. 1) 0700.
   2) is

B. 1) 0700.
   2) is **not**

C. 1) 0707.
   2) is

D. 1) 0707.
   2) is **not**

2.

Initial conditions:

- Reactor is tripped.
- PCV-445A, PWR RELIEF is stuck OPEN.
- MVG-8000A, RELIEF 445 A ISOL is OPEN and can **not** be closed.
- EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION is in progress.
- RCS pressure is 1300 psig and decreasing.
- FI-943, CHG LOOP B CLD/HOT LG FLOW GPM reads 0 gpm.

Current conditions:

- RCS pressure is 1350 psig and stabilizing.
- FI-943, CHG LOOP B CLD/HOT LG FLOW GPM reads 300 gpm and increasing.

Which ONE of the choices below completes the following statements?

In accordance with EOP-1.0, RCP trip criteria was **first** met in the ___(1)___ conditions

RCPs are secured in the conditions above to ___(2)___.

A. 1) initial
   2) minimize the heat input.

B. 1) initial
   2) prevent excessive depletion of RCS inventory.

C. 1) current
   2) minimize the heat input.

D. 1) current
   2) prevent excessive depletion of RCS inventory.

3.

Given the following plant conditions:

- An automatic Reactor trip and Safety Injection have occurred.
- EOP-16.0, FR-P.1 RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK is in progress.

Which ONE of the choices below completes the following statements?

The **first** major action the crew took in EOP-16.0 was to ___(1)___.

After the temperature soak period has been completed in accordance with EOP-16.0, operators are required to limit the subsequent cooldown rate in the RCS Cold Legs to a **maximum** of ___(2)___ in **any one** hour period.

A. 1) depressurize the RCS to minimize pressure stress.
   2) 70°F

B. 1) depressurize the RCS to minimize pressure stress.
   2) 50°F

C. 1) stop the RCS cooldown.
   2) 70°F

D. 1) stop the RCS cooldown.
   2) 50°F

4.

Initial conditions:

- 100% power.
- XCP-613, 3-1 VCT LVL HI/LO is in alarm.
- VCT level is 13% and decreasing.
- SOP-106, REACTOR MAKEUP WATER SYSTEM, section V.A. LOSS OF AUTOMATIC MAKEUP CONTROL is in progress.

Current conditions:

- Manual makeup to the VCT was unsuccessful.
- VCT level is 8% and decreasing.

NOTE the following transmitter names:

LT-112, VCT LEVEL %.

LT-115, VCT LEVEL %.

Which ONE of the choices below completes the following statements?

XCP-613, 3-1 VCT LVL HI/LO alarmed when VCT level reached a setpoint of ___(1)___%.

In the **current conditions**, Charging pump suction will automatically re-align to the RWST when ___(2)___ reaches 5%.

A. 1) 15
   2) **both** LT-112 and LT-115

B. 1) 15
   2) **either** LT-112 or LT-115

C. 1) 20
   2) **both** LT-112 and LT-115

D. 1) 20
   2) **either** LT-112 or LT-115

5.

Initial conditions:

- The vessel head is in place with no head bolts installed.
- An RCS leak has developed.
- AOP-115.5, ARG-1 LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6) is in progress.
- The “A” RHR pump has been started.
- Required Hot Leg Level is 17 1/2”.
- Current RHR Loop Flow is 2750 gpm.

Current conditions:

- “A” RHR pump is secured.
- “B” RHR pump could not be started.
- The crew is at the step to transfer RHR/RB Spray Sump water to the RWST.

Which ONE of the choices below completes the following statements in accordance with AOP-115.5?

In the **initial conditions**, RHR pump flow ___(1)___ within the required operating limits.

In the **current conditions**, while transferring sump water to the RWST, the crew is required to maintain RHR Sump levels greater than a **minimum** of ___(2)___ feet.

REFERENCE PROVIDED

A. 1) is
   2) 419.5

B. 1) is
   2) 414

C. 1) is **not**
   2) 419.5

D. 1) is **not**
   2) 414

6.

Given the following plant conditions:

Time 0700:

- 100% power.
- A loss of the active loop, “A” train of CCW, has occurred.
- “A” Charging pump is running.
- AOP-118.1, LOSS OF COMPONENT COOLING WATER is in progress.

Time 0715:

- An AO was dispatched to monitor “A” Charging pump temperatures locally.

Time 0722:

- The AO has started monitoring “A” Charging pump temperatures locally.
- “A” Charging pump temperatures are all in the required band.

Time 0730:

- “A” CCW loop was just restored.
- CCW flow to the Reactor Coolant Pumps are as follows:
  - RCP Thermal Barrier flow is 105 gpm.
  - RCP Bearing Cooler flow is 405 gpm.

Which ONE of the choices below completes the following statements in accordance with AOP-118.1?

The crew ___(1)___ required to trip the “A” Charging pump during this loss of CCW.

At **time 0730**, CCW flow to the RCP ___(2)___ is below the minimum flow required.

A. 1) was
   2) Thermal Barrier

B. 1) was **not**
   2) Thermal Barrier

C. 1) was
   2) Bearing Cooler

D. 1) was **not**
   2) Bearing Cooler

7.

Given the following plant conditions:

- 50% power and stable.
- RCS pressure is stable at 2235 psig.
- Rod Control System is in Manual.
- The OATC stepped rods **in** 5 steps.
- The PZR PRESS MASTER CONTROL is in Automatic and the output is failed AS-IS.

Which ONE of the choices below completes the following statement?

With no operator action, pressurizer pressure will ___(1)___.

Subsequently, the operator takes manual control of the PZR PRESS MASTER CONTROL, in accordance with OP-AA-100, CONDUCT OF OPERATIONS and initially ___(2)___ demand to restore RCS pressure to 2235 psig.

A. 1) increase.
   2) raises

B. 1) increase.
   2) lowers

C. 1) decrease.
   2) raises

D. 1) decrease.
   2) lowers

8.

Initial conditions:

- 100% power initially.
- The Reactor failed to automatically or manually trip.
- EOP-13.0, FR-S.1 RESPONSE TO ABNORMAL NUCLEAR POWER GENERATION is in progress.
- Control Rods failed to insert automatically or manually.
- MVG-8104, EMERG BORATE is open.
- FI-110, EMERG BORATE FLOW GPM reads 25 gpm and stable.

Current conditions:

- EOP-13.0 is still in progress.
- A Safety Injection occurred.
- Both ESF Loading Sequences are complete.

Which ONE of the choices below completes the following statements?

In the **initial conditions**, Boric Acid flow rate ___(1)___ meet the **minimum** required flow rate.

In the **current conditions**, flow ___(1)___ indicated on FI-110.

A. 1) does
   2) is

B. 1) does
   2) is **not**

C. 1) does **not**
   2) is

D. 1) does **not**
   2) is **not**

9.

Given the following plant conditions:

- 100% power initially.
- Blowdown return flow is aligned to the condenser.
- XCP-646 2-1, MN STM LINE RM-G19 HI RAD is in alarm.
- An automatic Reactor Trip and Safety Injection occurred.
- EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION is in progress.
- The following response was seen on RM-G19A:

	Before trip
Reading:	39.7 mREM/hr

Which ONE of the choices below completes the following statements?

RM-G19A will read ___(1)___ than 39.7 mREM/hr 10 minutes after the reactor trip.

Based on the conditions above, in accordance with EOP-1.0, ___(2)___ is another radiation monitor that can be used to diagnose a transition to EOP-4.0, E-3 STEAM GENERATOR TUBE RUPTURE.

A. 1) higher
   2) RM-L3, STEAM GENERATOR BLOWDOWN LIQUID MONITOR

B. 1) lower
   2) RM-L3, STEAM GENERATOR BLOWDOWN LIQUID MONITOR

C. 1) higher
   2) RM-A9, CNDSR EXHAUST GAS ATMOS MONITOR

D. 1) lower
   2) RM-A9, CNDSR EXHAUST GAS ATMOS MONITOR

10.

Initial conditions:

- 45% power initially.
- All three Main Feedwater Pump speeds are increasing.

Current conditions:

- All three Main Feedwater Pumps have tripped.

Which ONE of the choices below completes the following statements?

In the **initial conditions**, the MCB MASTER SPEED CNTRL is placed in MAN and adjusted to between ___(1)___ demand OR as needed in accordance with AOP-210.3, FEEDWATER PUMP MALFUNCTION.

In the **current conditions**, the Turbine Driven EFW pump ___(2)___ **directly** receive a start signal from the Main Feedwater pumps tripping.

A. 1) 35% and 40%
   2) did

B. 1) 35% and 40%
   2) did **not**

C. 1) 50% and 60%
   2) did

D. 1) 50% and 60%
   2) did **not**

11.

Initial condition:

- 100% power initially.
- All offsite power was lost (115 KV and 230 KV).
- "A" and "B" EDG failed to start.

Current condition:

- Power will be restored via XTF5052, ALTERNATE AC SOURCE TRANSFORMER in accordance with SOP-304, 115KV/ 7.2KV OPERATIONS.

Which ONE of the choices below answers both of the following questions?

1) What is the maximum number of 7.2 KV ESF busses that can be restored from this source at one time in accordance with SOP-304?

2) Which 7.2 KV ESF bus can be energized **only** by its ALTERNATE feeder breaker from this source?

A. 1) 1 bus.
   2) 1DA.

B. 1) 1 bus.
   2) 1DB.

C. 1) 2 busses.
   2) 1DA.

D. 1) 2 busses.
   2) 1DB.

12.

Given the following plant conditions:

- A loss of All offsite Power (230KV and 115KV) coincident with a Small Break LOCA has occurred.
- EOP-2.1, ES-1.2 POST-LOCA COOLDOWN AND DEPRESSURIZATION is in progress.
- The crew is currently verifying conditions for Natural Circulation.

Which ONE of the choice below completes the following statements in accordance with EOP-2.1?

If natural circulation **is met**, EOP-2.1 requires depressurizing the RCS using ___(1)___.

If natural circulation **is not met**, EOP-2.1 requires an increase of dumping steam using ___(2)___.

A. 1) normal PZR Spray.
   2) S/G PORV.

B. 1) a PZR PORV.
   2) Condenser Steam Dumps.

C. 1) normal PZR Spray.
   2) Condenser Steam Dumps.

D. 1) a PZR PORV.
   2) S/G PORV.

13.

Given the following plant conditions:

Time 0800:

- APN-5902 lost power.

Time 0802:

- Reactor trip and Safety Injection have occurred.
- EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION is in progress.
- Both Latched SI lights are OFF.

Which ONE of the choices below completes the following statements?

At **time 0802**, the remaining coincidence for the RHR Sump valve swap over is ___(1)___.

When XCP-612 4-3, RWST LVL LO-LO XFER TO SUMP alarm comes in, swap over to the RHR Sump ___(2)___ occur.

A. 1) 2/3.
   2) will

B. 1) 1/3.
   2) will

C. 1) 2/3.
   2) will **not**

D. 1) 1/3.
   2) will **not**

14.

Given the following plant conditions:

- A loss of instrument air occurred.
- The crew entered AOP-220.1, LOSS OF INSTRUMENT AIR.
- The crew has tripped the reactor.
- Operators are locally controlling Steam Generator PORVs.
- All Main Steam Isolation Valves have been closed.

Which ONE of the choices below completes the following statements in accordance with a CAUTION in AOP-220.1?

Operators will maintain differential temperature LESS THAN a **maximum** of ___(1)___ between any two Reactor Coolant loops.

Operators are maintaining steam loads balanced to prevent a Safety Injection from ___(2)___.

A. 1) 50°F
   2) Steamline ΔP.

B. 1) 50°F
   2) Steamline Pressure Low.

C. 1) 25°F
   2) Steamline ΔP.

D. 1) 25°F
   2) Steamline Pressure Low.

15.

Initial conditions:

- A Small Break LOCA outside the RB has occurred.
- EOP-2.5, LOCA OUTSIDE CONTAINMENT is in progress.
- The crew is at the step to isolate Normal Letdown.
  - Letdown failed to isolate from the Main Control Board.

Current conditions:

- All appropriate actions of EOP-2.5 have been completed.
- The LOCA can **not** be isolated.
- RWST level is 80% and decreasing.
- RCS pressure is 1550 psig and decreasing.

Which ONE of the choices completes the following statements?

In the **initial conditions**, EOP-2.5 requires an operator to close LCV-459 and LCV-460, LTDN LINE ISOL ___(1)___.

In the **current conditions**, entry conditions for EOP-2.4, ECA-1.1 LOSS OF EMERGENCY COOLANT RECIRCULATION ___(2)___ met.

A. 1) locally at the valves.
   2) are **not**

B. 1) locally at the valves.
   2) are

C. 1) at the CREP.
   2) are **not**

D. 1) at the CREP.
   2) are

16.

Given the following plant conditions:

- 100% power initially.
- A loss of all Feedwater pumps occurred.
- EOP-15.0, FR-H.1 RESPONSE TO LOSS OF SECONDARY HEAT SINK is in progress.
- Operators have started the “A” Motor Driven EFW pump.
- Bleed and Feed has been established.
- RCS temperatures are decreasing.

Which ONE of the choices below completes the following statements?

In accordance with EOP-15.0, operators are required to establish feed to ___(1)___ unisolated Steam Generator(s) by ___(2)___ the associated EFW Flow Control Valve(s).

A. 1) one
   2) fully opening without delay

B. 1) all
   2) fully opening without delay

C. 1) one
   2) throttling open until WR SG level increases, then increase feed flow using

D. 1) all
   2) throttling open until WR SG level increases, then increase feed flow using

17.

Initial conditions:

- A LOCA has occurred.
- A rupture of the RWST occurred.
- EOP-2.4, ECA-1.1 LOSS OF EMERGENCY COOLANT RECIRCULATION is in progress.
- RCS pressure is 450 psig and stable.
- MVG-8706A(B), RHR LP A(B) TO CHG PP are closed.
- The crew is going to establish one train of Safety Injection flow to conserve RWST inventory.

Current conditions:

- The crew is depressurizing all SGs to inject Safety Injection Accumulators.
- All Steam Generator pressures read 150 psig.

Which ONE of the choices below completes the following statement in accordance with EOP-2.4?

In the **initial conditions**, after the crew has established one train of Safety Injection flow, one RHR pump ___(1)___ be running.

In the **current conditions**, Steam Generator pressures ___(2)___ meet the conditions to secure the Steam Generator depressurization.

A. 1) will **not**
   2) do

B. 1) will **not**
   2) do **not**

C. 1) will
   2) do

D. 1) will
   2) do **not**

18.

Given the following plant conditions:

- All Steam Generators are faulted outside containment.
- EOP-3.1, ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS is in progress.
- Normal Charging has been established.
- RB pressure is 0.8 psig.
- RCS Subcooling is 50°F.
- Pressurizer level is 14%.

NOTE the following valve names:

MVG-2802A, EF PUMP TURBINE SUPPLY VLV MS HEADER B EF PUMP TURBINE SUPPLY VLV

MVG-2802B, EF PUMP TURBINE SUPPLY VLV MS HEADER C EF PUMP TURBINE SUPPLY VLV

Which ONE of the choices below completes the following statements?

When the Turbine Driven EFW pump started, MVG-2802A and MVG-2802B ___(1)___ automatically change position from their normal alignment.

Safety Injection ___(2)___ required to be reinitiated in the conditions above.

A. 1) did
   2) is

B. 1) did
   2) is **not**

C. 1) did **not**
   2) is

D. 1) did **not**
   2) is **not**

19.

Initial conditions:

- 100% power initially.
- A down power was commenced for turbine valve testing.
- During the down power, rod F-10 of Control Bank D stuck.
- AOP-403.5, STUCK OR MISALIGNED CONTROL ROD is in progress.
- Operators are at the step to align the misaligned Control Rod with the AFFECTED Bank.
- An Operator was sent to place the appropriate Lift Coil Disconnect Switch(es) to the ROD DISCONNECTED position.

Current conditions:

- Operators have just finished re-aligning all Control Bank D rods.

Which ONE of the choices below completes the following statements in accordance with AOP-403.5?

In the **initial conditions**, the Lift Coil Disconnect Switch(es) for ___(1)___ will be placed to the ROD DISCONNECTED position.

In the **current conditions**, Control Bank D Group Step Counters will be reset ___(2)___.

A. 1) **only** the affected rod
   2) locally.

B. 1) **only** the affected rod
   2) on the Main Control Board.

C. 1) all rods in the bank **except** the affected rod
   2) locally.

D. 1) all rods in the bank **except** the affected rod
   2) on the Main Control Board.

20.

Initial conditions:

- A small break LOCA has occurred.
- EOP-2.1, ES-1.2 POST LOCA COOLDOWN AND DEPRESSURIZATION is in progress.
- All RCPs are OFF.
- "A" and "B" Charging pumps are running in injection mode.
- The RO is depressurizing the RCS using a Pressurizer PORV.
- Core Exit TCs are 557°F and stable.
- Pressurizer Level is 0%.
- NR RVLIS is 75% and stable.

Current conditions:

- The RO reports that the open Pressurizer PORV and its associated block valve **cannot** be closed.
- Core Exit TCs are 590°F and increasing.
- RCS pressure is 1365 psig and decreasing.
- Pressurizer Level is 23% and increasing at 1% per second.
- NR RVLIS is 50% and decreasing.

Which ONE of the following describes the reason for the change in Pressurizer level in the **current** conditions above?

A. Charging pump flowrates are **not** increasing but approximately half of the reactor vessel head is voided with an expanding steam volume.

B. Charging pump flowrates are **not** increasing but the reactor vessel head is completely voided with core voiding now occurring.

C. Charging pump flowrates are increasing **and** the reactor vessel head is completely voided with core voiding now occurring.

D. Charging pump flowrates are increasing **and** approximately half of the reactor vessel head is voided with an expanding steam volume.

21.

Given the following plant conditions:

- Plant is shutdown.
- N-31, SOURCE RANGE has failed.
- AOP-401.9, SOURCE RANGE CHANNEL FAILURE is in progress.
- N-33, REMOTE SOURCE RANGE MONITOR, is being placed in service in accordance with SOP-404, EXCORE NUCLEAR INSTRUMENTATION SYSTEM.

Which ONE of the choices below completes the following statements?

In accordance with SOP-404, N-33 fuses will be installed at the ___(1)___.

N-33 fuses are removed during power and startup operations to protect against ___(2)___.

A. 1) CREP.
   2) failure of the high voltage cutoff circuitry.

B. 1) CREP.
   2) inadvertent actuation of the Reactor Building evacuation alarm.

C. 1) Source Range drawer in the Main Control Room.
   2) failure of the high voltage cutoff circuitry.

D. 1) Source Range drawer in the Main Control Room.
   2) inadvertent actuation of the Reactor Building evacuation alarm.

22.

Given the following plant conditions:

- A reactor and plant shutdown is in progress from 100%.

Which ONE of the choices below completes the following statements?

The Intermediate Range High Flux reactor trip will automatically be reinstated when reactor power **first** goes below ___(1)___.

A blown instrument power fuse ___(2)___ result in a loss of the high voltage power supply to the N-36 detector.

A. 1) 10%.
   2) will

B. 1) 25%.
   2) will

C. 1) 10%.
   2) will **not**

D. 1) 25%.
   2) will **not**

23.

Initial conditions:

- 100% power.
- RM-A3, MAIN PLANT VENT EXHAUST AIR MONITOR is out of service.
- A waste gas release is in progress in accordance with SOP-119, WASTE GAS PROCESSING.
- Counts are stable on RM-A10, WASTE GAS DISCHARGE AIR MONITOR.
- XCP-642 1-1, PLANT VENT RM-A13 HI RAD is in alarm.

Current conditions:

- The release is secured.
- RM-A10 is declared inoperable.

NOTE The following valve names:

HCV-014, WASTE GAS DISCHARGE CONTROL VALVE

Which ONE of the choices below completes the following statement in accordance with the appropriate ARP?

The release was terminated when HCV-014 ___(1)___ closed.

RM-A10 being declared inoperable will require actions to be taken from ___(2)___ to restart the release.

A. 1) was manually
   2) ODCM, Section 1.2.1, Radioactive Gaseous Effluent Monitoring Instrumentation.

B. 1) was manually
   2) T.S. 3.3.3 Radiation Monitoring Instrumentation.

C. 1) automatically
   2) ODCM, Section 1.2.1, Radioactive Gaseous Effluent Monitoring Instrumentation.

D. 1) automatically
   2) T.S. 3.3.3 Radiation Monitoring Instrumentation.

24.

Given the following plant conditions:

- Core Off-load is in progress.
- The Refueling SRO reported a dropped fuel assembly.
- XCP-646 4-1, MANIP CRN RM-G17B HI RAD is in alarm.
- XCP-642 4-1, RB BRIDGE AREA RM-G6 HI RAD is in alarm.

NOTE the following Radiation Monitor names:

RM-G6, REFULING BRIDGE AREA

RM-G17B, RB MANIPULATOR CRANE AREA

Which ONE of the choices below completes the following statements?

When ___(1)___ alarmed, the ARP required operators to verify ___(2)___.

A. 1) RM-G17B
   2) XFN-11B, SPLY FAN "B" and XFN-13B, EXH FAN "B" stopped.

B. 1) RM-G17B
   2) XVB-1B, CNTMT SPLY ISOL and XVB-2B, CNTMT EXH ISOL closed.

C. 1) RM-G6
   2) XFN-11B, SPLY FAN "B" and XFN-13B, EXH FAN "B" stopped.

D. 1) RM-G6
   2) XVB-1B, CNTMT SPLY ISOL and XVB-2B, CNTMT EXH ISOL closed.

25.

Given the following plant conditions:

- 100% power.
- There is a fire in the plant.
- The Electric Driven Fire Pump failed to start automatically.

Which ONE of the choices below completes the following statements?

The Electric Driven Fire Service Pump ___(1)___ located in the Circulating Water Pump house.

The Electric Driven Fire Service Pump ___(2)___ be started from the Control Room.

A. 1) is
   2) can **not**

B. 1) is **not**
   2) can **not**

C. 1) is
   2) can

D. 1) is **not**
   2) can

26.

Initial conditions:

- A Small Break LOCA has occurred.
- All RCPs are stopped.
- EOP-14.0, FR-C.1 RESPONSE TO INADEQUATE CORE COOLING is in progress at step 1.

Current conditions:

- The crew is at the step to check if RCPs should be started in accordance with EOP-14.0
- Core Exit TCs are 1205°F and increasing.
- SG Narrow Range levels are all 60%.

Which ONE of the choices below completes the following statements?

EOP-14.0 will **first** attempt to ___(1)___ the RCS.

In the **current conditions**, EOP-14.0 ___(2)___ require starting a RCP.

A. 1) establish Safety Injection flow to
   2) does

B. 1) establish Safety Injection flow to
   2) does **not**

C. 1) depressurize the SGs to depressurize
   2) does

D. 1) depressurize the SGs to depressurize
   2) does **not**

27.

Given the following plant conditions:

- A loss of 230 KV power occurred.
- “B” Diesel Generator tripped immediately after start.
- A Technical Specification action statement requires taking the plant to COLD SHUTDOWN expeditiously.
- EOP-1.4, ES-0.3 NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL is in progress.
- Operators are performing an RCS cooldown.
- Narrow Range RVLIS is 72% and decreasing.

Which ONE of the choices below completes the following statements?

Steam voiding in the reactor vessel head is more likely to occur because ___(1)___ are **not** available.

In accordance with a NOTE in EOP-1.4, maintaining Narrow Range RVLIS close to ___(2)___ will allow subcooled RCS liquid to condense steam from the reactor vessel head.

A. 1) CRDM Shroud Exhaust Fans
   2) 70%

B. 1) CRDM Shroud Exhaust Fans
   2) 93%

C. 1) pressurizer backup heaters
   2) 70%

D. 1) pressurizer backup heaters
   2) 93%

28.

Given the following plant conditions:

Time 0700:

- 25% power.
- “A” RCP shaft vibrations are 6.26 mils.

Time 1400:

- Frame vibrations have increased simultaneously with shaft vibrations.
- “A” RCP shaft vibrations are 16 mils and has been increasing linearly since 0700.

Which ONE of the choices below completes the following statements?

At **time 0700**, XCP-617 1-3 RCP A VIBR HI ___(1)___ in alarm due to shaft vibrations.

At **time 1400**, “A” RCP ___(2)___ required to be secured in accordance with SOP-101, REACTOR COOLANT SYSTEM.

A. 1) is
   2) is

B. 1) is **not**
   2) is

C. 1) is **not**
   2) is **not**

D. 1) is
   2) is **not**

29.

Given the following plant conditions:

- A plant startup is in progress.
- 35% power.
- “A” RCP trips.

Which ONE of the choices below completes the following statement?

After the “A” RCP Tripped, RCS Loop “A” T_{AVG} will ___(1)___ due to ___(2)___.

CONSIDER PLANT CONDITIONS ONE MINUTE AFTER THE RCP HAS TRIPPED.

A. 1) decrease
   2) the EFW flow post reactor trip.

B. 1) decrease
   2) T_{HOT} decreasing to the value of T_{COLD}.

C. 1) stay the same
   2) turbine load remaining unchanged.

D. 1) stay the same
   2) Thot increasing by the same amount Tcold decreased.

30.

Given the following plant conditions:

- 100% power.
- PVT-8149A, LTDN ORIFICE A ISOL, has been tagged out.
- TE-144, HX (CC CNTRL) TEMP °F, has failed low.

Which ONE of the choices below answers the following questions?

1) What is the **maximum** amount of letdown flow that can be established?

2) How will TE-144 failing low affect letdown temperature?

A. 1) 105
   2) Letdown temperature will increase.

B. 1) 120
   2) Letdown temperature will increase.

C. 1) 105
   2) Letdown temperature will decrease.

D. 1) 120
   2) Letdown temperature will decrease.

31.

Initial conditions:

- Reactor trip and safety injection have occurred.
- EOP-3.1, ECA-2.1 UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS is in progress.
- RCS pressure is 900 psig and increasing.
- Pressurizer level is 25% and increasing.

Current conditions:

- RCS pressure is 475 psig and decreasing uncontrollably.

Which ONE of the choices below completes the following statements?

In the **initial conditions**, RHR pumps are secured to ___(1)___ in accordance with EOP-3.1.

In the **current conditions**, RHR pumps will be restarted when pressure reaches a **minimum** value of ___(2)___ psig.

A. 1) reduce injection flow
   2) 325

B. 1) reduce injection flow
   2) 425

C. 1) avoid damage to the RHR pumps
   2) 325

D. 1) avoid damage to the RHR pumps
   2) 425

32.

Given the following plant conditions:

- A plant cooldown is in progress.
- XCP-610 2-5, RCS TEMP LO AND RHR SUCT VLV NOT OPEN is in alarm.
- Operators verified that "A" RHR train valves are in the normal alignment.

Which ONE of the choices below completes the following statements?

This alarm would be caused by ___(1)___ being partially closed.

In accordance with LCO 3.4.9.3, OVER PRESSURE PROTECTION SYSTEMS, Cold Overpressure protection must be in service when RCS cold leg is less than or equal to a **maximum** temperature of ___(2)___.

A. 1) MVG-8809B, RWST TO RHR PP B
   2) 200°F

B. 1) MVG-8809B, RWST TO RHR PP B
   2) 300°F

C. 1) MVG-8702B, RCS LP C TO PUMP B
   2) 300°F

D. 1) MVG-8702B, RCS LP C TO PUMP B
   2) 200°F

33.

Given the following plant conditions:

- 100% power.
- Makeup to the "A" SI Accumulator was just completed.
- "A" SI Accumulator parameters are as follows:
  - Boron Concentration: 2507 ppm
  - Pressure: 607 psig

Which ONE of the following describes whether the boron concentration and pressure are within the Technical Specification limits of 3.5.1, ACCUMULATORS?

	Boron Concentration	**Pressure**
A.	Within limit	Within limit
B.	Outside limit	Within limit
C.	Within limit	Outside limit
D.	Outside limit	Outside limit

34.

Given the following plant conditions:

- A large-break LOCA occurred.
- “A” RHR pump has tripped.
- RWST level is 15%.
- XCP-612, 4-3, RWST LVL LO-LO XFER TO SUMP is in alarm.
- The actions of EOP-2.2, ES-1.3 TRANSFER TO COLD LEG RECIRCULATION are complete.

Which ONE of the choices below completes the following statement?

In the conditions above, the “A” Charging pump is ___(1)___ and the Charging Pump miniflow line valve MVG-8109A, CHG PP A is ___(2)___.

A. 1) running
   2) open.

B. 1) running
   2) closed.

C. 1) secured
   2) open.

D. 1) secured
   2) closed.

35.

Initial conditions:

- 100% power.
- The crew just finished venting the PRT to reduce pressure in accordance with SOP-101, REACTOR COOLANT SYSTEM.

Current conditions:

- Reactor trip and Safety Injection has occurred.
- RB Pressure is 20 psig and stable.

Which ONE of the choices below completes the following statements?

In the **initial conditions**, the PRT was vented to the ___(1)___ header to decrease pressure.

In the **current conditions**, the PRT rupture disc ___(2)___ relieve when PRT pressure reaches 70 psig.

CONSIDER NO ADDITIONAL OPERATOR ACTIONS

A. 1) Waste Gas
   2) will

B. 1) RB Purge Exhaust
   2) will

C. 1) Waste Gas
   2) will **not**

D. 1) RB Purge Exhaust
   2) will **not**.

36.

Given the following plant conditions:

Time 0700:

- 75% power.
- "A" CCW train is active.
- "B" CCW pump is **inoperable**.
- There are **no** Technical Specification Action Statements in effect.

Time 0710:

- DPN1HB, BATTERY MAIN DISTRIBUTION PANEL 1HB, is **deenergized** due to a malfunction.

Time 0715:

- A large break LOCA occurred.
- A loss of all offsite power (115 KV and 230 KV) occurred.
- EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION is in progress.

Which ONE of the choices below completes the following statement?

While performing EOP-1.0, ATTACHMENT 3, SI EQUIPMENT VERIFICATION, the BOP will find "C" CCW pump_____.

A. **off** and can **not** be manually started.

B. **off** and a manual start will be required because the "B" Train ESFLS is deenergized.

C. **running** because "A" CCW header pressure decreased below the autostart setpoint.

D. **running** because it was aligned to operate as the "B" train CCW pump.

37.

Given the following plant conditions:

Time 0800:

- 100% power.
- A total loss of CCW has occurred.
- AOP-118.1, LOSS OF COMPONENT COOLING WATER was just entered.

Time 0805:

- RCP temperatures are as follows:
  - Motor Bearing temperature is 185°F.
  - Lower Seal Water Bearing Temperature is 200°F.
  - CBO temperature is 245°F.

Time 0815:

- RCP temperatures are as follows:
  - Motor Bearing temperature is 190°F.
  - Lower Seal Water Bearing Temperature is 205°F.
  - CBO temperature is 253°F.

Which ONE of the choices below completes the following statement?

In accordance with AOP-118.1, operators are **first** required to trip RCPs at time _____.

CONSIDER ALL TEMPERATURES RISE LINEARLY

A. 0805

B. 0810

C. 0815

D. 0820

38.

Initial condition:

- 75% power initially.
- All Pressurizer heaters are energized.
- A safety injection occurs.

Current conditions:

- SI has been reset.
- Both ESF Loading Sequencers have been reset.
- Pressurizer level is 14%.

Which ONE of the choices below completes the following statements?

The **Control Group** Pressurizer heaters ___(1)___ **directly** de-energized by operation of the ESF Loading Sequencer.

In the **current conditions**, the OATC ___(2)___ energize the Pressurizer **Back Up Group 1** heaters.

A. 1) are
   2) can

B. 1) are
   2) can **not**

C. 1) are **not**
   2) can **not**

D. 1) are **not**
   2) can

39.

Given the following plant conditions:

- Reactor startup in progress in accordance with GOP-4A, POWER OPERATION (MODE 1 – ASCENDING).
- 23% power.
- N44, PR, fails high.

Which ONE of the choices below describes the status of the reactor and why?

CONSIDER NO OPERATOR ACTIONS

A. At power, the coincidence was not met which prevented a reactor trip.

B. At power, the failed channel is for control **only**, not for reactor protection.

C. Tripped, the Power Range High Flux (Low Setpoint) initiated a reactor trip.

D. Tripped, the Overtemperature ΔT initiated a reactor trip.

40.

Initial conditions:

- A reactor startup is in progress in accordance with GOP-3, REACTOR STARTUP FROM HOT STANDBY TO STARTUP (MODE 3 TO MODE 2).
- The crew is at the step to increase Reactor Power to 10^{-3}%.

Current Conditions:

- 7% power.
- The SR TRAIN B (Train "B" Source Range High Flux Trip Block) switch is inadvertently placed in RESET.

Which ONE of the choices below completes the following statements?

In the **initial conditions**, the Source Range High flux trip must be blocked prior to reaching a **maximum** power of___(1)___.

In the **current conditions**, a reactor trip ___(2)___ occur.

A. 1) $7.5x10^{-6}$%.
   2) did

B. 1) $7.5x10^{-6}$%.
   2) did **not**

C. 1) 10^{5} CPS.
   2) did

D. 1) 10^{5} CPS.
   2) did **not**

41.

Which ONE of the choices below identifies the power supply to "A" Train Engineered Safety Features Loading Sequencer?

A. APN-5901, 120VOLT VITAL AC DISTR PANEL 1 NSSS

B. APN-5903, 120VOLT VITAL AC DISTR PANEL 3 NSSS

C. APN01DA2, INTERMEDIATE BLDG 240/120 VAC DISTR PNL

D. DPN-1HA1, BATTERY MAIN DISTRIBUTION PANEL 1HA

42.

Given the following plant conditions:

- 100% power.
- RBCU TRAIN A EMERG switch is selected to XFN-64A.
- A Safety Injection occurs.
- The BOP is performing Attachment 3 of EOP-1.0, SI EQUIPMENT VERIFICATION.

NOTE the following procedure titles:

EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION.

Which ONE of the following choices below completes the following statements?

In accordance with EOP-1.0, Attachment 3, Service Water flow is required to be verified greater than a **minimum** value of ___(1)___ **for each train** of RBCUs.

MVG-3109B, RBCU 65A OUTLET ISOL is expected to be in the ___(2)___ position for the conditions above.

A. 1) 2000 gpm
   2) closed

B. 1) 2000 gpm
   2) open

C. 1) 4000 gpm
   2) closed

D. 1) 4000 gpm
   2) open

43.

Initial conditions:

- A Large Break LOCA has occurred.
- RB Pressure is 25 psig and rising.
- EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION immediate actions have just been completed.

Current conditions:

- RWST level is 16%.
- Operators are transitioning to EOP-2.2, ES-1.3 TRANSFER TO COLD LEG RECIRCULATION.

Which ONE of the choices below completes the following statements?

The RB Spray pumps ___(1)___ cooled by Component Cooling water.

In the **current conditions**, RB Spray Suction ___(2)___ receive a signal to automatically re-align to the sumps.

A. 1) are
   2) did

B. 1) are **not**
   2) did **not**

C. 1) are
   2) did **not**

D. 1) are **not**
   2) did

44.

Given the following plant conditions:

- 100% power initially.
- A steam leak has occurred inside containment.
- All Steam Generator pressures are 650 psig decreasing rapidly.

Which ONE of the choices below completes the following statement?

The Steam Line Low Pressure signal ___(1)___ rate sensitive.

The Main Steam Line Isolation valves ___(2)___ received a signal to close.

A. 1) is
   2) have

B. 1) is
   2) have **not**

C. 1) is **not**
   2) have

D. 1) is **not**
   2) have **not**

45.

Given the following plant conditions:

Time 1059:

- 100% power.
- XCP-622 3-6, IB SMP LVL HI is in alarm.
- XCP-623 3-6, IB SMP LVL HI is in alarm.

Time 1100:

- All Main Feedwater pumps are tripped.
- Turbine did **not** trip automatically.

Time 1101:

- Turbine is manually tripped.
- SG NR levels all read 0%.

Time **now** is 1102:

- All SG NR levels have remained at 0%.

Which ONE of the choices below completes the following statements?

At **time 1059**, the High IB Sump level ___(1)___ send a direct signal to start **all** Emergency Feedwater pumps.

AMSAC actuation was initiated when SG NR level **first** reached ___(2)___.

A. 1) did
   2) 10%.

B. 1) did
   2) 26%.

C. 1) did **not**
   2) 10%.

D. 1) did **not**
   2) 26%.

46.

Initial conditions:

- 100% power initially.
- “C” Service Water pump is out of service.
- An Earthquake has occurred.
- Reactor Trip and Safety Injection have occurred.
- “B” Service Water pump tripped and can not be restarted.
- Condensate Storage Tank level is lowering rapidly.
- All EFW Pump suction header pressure transmitters decreased to 9.0 psig.

Current conditions:

- Service Water to Emergency Feedwater swapover has been verified.

Which ONE of the choices below completes the following statements?

In the **initial conditions**, Service Water to Emergency Feedwater swapover ___(1)___ occurred.

In the **current conditions**, the “A” Service Water pump ___(2)___ supplying the suction of the “B” Motor Driven EFW pump.

A. 1) has **not**
   2) is

B. 1) has
   2) is

C. 1) has **not**
   2) is **not**

D. 1) has
   2) is **not**

47.

Given the following plant conditions:

- "A" Diesel Generator is paralleled with ESF bus 1DA.
- A positive 250 KVARS OUT has been established on DG A KILOVARS.
- “A” Diesel output has been 500 KW for the past 5 hours.

Which ONE of the choices below completes the following statements for the conditions above?

___(1)___ the voltage control setpoint will cause DG A KILOVARS to read a higher positive value.

Operators ___(2)___ required to raise diesel output prior to shutting it down in accordance with SOP-306, EMERGENCY DIESEL GENERATOR.

A. 1) Lowering
   2) are

B. 1) Lowering
   2) are **not**

C. 1) Raising
   2) are

D. 1) Raising
   2) are **not**

48.

Given the following plant conditions:

- The unit is in MODE 3.
- Maintenance was just completed on the 'A' Train of the Service Water (SW) system.
- The SW pump breakers 'A' and 'C' have just been racked up on the 'A' train bus with both switches in NORMAL-AFTER-STOP following the maintenance.
- All offsite power was lost (115 KV and 230 KV).
- 'B' EDG failed to start automatically or manually.
- The 'A' EDG is supplying the 1DA bus.
- The crew has entered AOP-304.1B, LOSS OF BUS 1DB WITH THE DIESEL NOT AVAILABLE.
- Neither SW pump on the 'A' Train is running.

Which ONE of the choices below completes the following statements?

Both of the SW pumps ___(1)___ have started when power was restored to bus 1DA.

If **no** service water pumps can be started, AOP-304.1B will direct starting the ___(2)___ Fire pump.

A. 1) should
   2) Diesel Driven

B. 1) should
   2) Alternate Diesel

C. 1) should **not**
   2) Diesel Driven

D. 1) should **not**
   2) Alternate Diesel

49.

Given the following plant conditions:

- 100% power.
- Internal short resulted in a power loss to 125 VDC circuit XPN6095.
- AOP-100.5, LOSS OF MAIN CONTROL BOARD ANNUNCIATORS is in progress.
- The crew is ensuring T_{AVG} is above the minimum temperature for criticality in accordance with GTP-702, Attachment IV.G, T-AVG/T-REF DEVIATION ALARM NOT RESET.

Which ONE of the choices below completes the following statements?

In accordance with AOP-100.5, to clear the MCB annunciator power loss bell, the crew will ___(1)___.

RCS T_{AVG} must be greater than a **minimum** value of ___(2)___ to be above the minimum temperature for criticality.

A. 1) depress the silence push button.
   2) 551°F

B. 1) depress the silence push button.
   2) 557°F

C. 1) remove control power fuse in the MCB.
   2) 551°F

D. 1) remove control power fuse in the MCB.
   2) 557°F

50.

Initial conditions:

- A reactor trip and safety injection have occurred.
- “A” Diesel Generator is running in the emergency mode supplying bus 1DA.

Current conditions:

- XCX-5201 2-2, HIGH COOLANT TEMPERATURE is in alarm for the “A” Diesel Generator.
- An AO reports that Jacket Water Temperature is 200°F.

Which ONE Of the choices below completes the following statements?

In the **current conditions**, the “A” Diesel Generator ___(1)___ trip.

In the **current conditions**, XVG-3105A-SW, DIESEL GENERATOR COOLER A FS SUPPLY VLV ___(2)___ automatically open.

A. 1) did
   2) did

B. 1) did
   2) did **not**

C. 1) did **not**
   2) did **not**

D. 1) did **not**
   2) did

51.

Given the following plant conditions:

Time 0700:

- The electric plant is in a normal lineup.

Time 0701:

- A large steamline break resulted in a Reactor Trip and Safety Injection.
- Concurrently, all offsite power was lost (115KV and 230KV).
- "A' EDG started but its output breaker will **not** close.

Time now is 0710:

Which ONE of the choices below completes the following statements?

The **load shed sequence** for “A” Train was initiated directly from the loss of ___(1)___.

At **time 0710**, the “A” Train equipment **loading sequence** ___(2)___ complete.

A. 1) 115KV
   2) is

B. 1) 230KV
   2) is

C. 1) 115KV
   2) is **not**

D. 1) 230KV
   2) is **not**

52.

Given the following plant conditions:

- 100% power.
- Steam Generator blowdown return is aligned to the condenser.
- XCP-646 4-6, LIQ NB DISCH RM-L7 TRBL is in alarm.
- RM-L7, NB WASTE EFFLUENT LIQUID RADIATION MONITOR has lost power.

Which ONE of the choices below completes the following statements?

PVD-6121, NUC BLOWDOWN DISCHARGE ___(1)___ automatically close on the loss of power to RM-L7.

The CRS will determine the required actions in accordance with ___(2)___.

A. 1) did
   2) Technical Specifications 3.3.3, Radiation Monitoring Instrumentation.

B. 1) did
   2) ODCM, Section 1.1.1, Radioactive Liquid Effluent Monitoring Instrumentation.

C. 1) did **not**
   2) Technical Specifications 3.3.3, Radiation Monitoring Instrumentation.

D. 1) did **not**
   2) ODCM, Section 1.1.1, Radioactive Liquid Effluent Monitoring Instrumentation.

53.

Time 1000:

- 25% power.
- The “B” Train of Component Cooling Water (CCW) is the active loop.
- The “B” CCW pump is running.
- The CCW Booster pumps are aligned as follows:
  - “A” booster pump is in OFF.
  - “B” booster pump is in AUTO.
  - “C” booster pump is running.
- A 51BX lockout on BOP bus 1C occurs.

Time 1008:

- A loss of power to 1DB has occurred.
- “B” Diesel Generator failed to start automatically or manually.

Which ONE of the choices below completes the following statements?

The **“C”** CCW Booster pump lost power at time ___(1)___.

At **time 1009**, the “B” CCW Booster pump is tripped due to ___(2)___.

A. 1) 1000
   2) a loss of power.

B. 1) 1000
   2) low suction pressure.

C. 1) 1008
   2) a loss of power.

D. 1) 1008
   2) low suction pressure.

54.

Initial conditions:

- A Refueling outage is in progress.
- “A” Instrument Air Compressor is running.
- “B” Instrument Air Compressor is in standby.
- Supplemental air compressor is supplying breathing air.

Current conditions:

- Instrument air header pressure is 60 psig and decreasing.

Which ONE of the choices below completes the following statements?

The Standby Instrument Air Compressor starts once receiver tank pressure reaches ___(1)___ psig.

In the **current conditions**, XVB-2633, IA BACKUP SYSTEM SUP HDR ISOLATION VLV ___(2)___ automatically open to supply air to the Instrument Air system from the Supplemental air compressor.

A. 1) 90
   2) did

B. 1) 105
   2) did

C. 1) 90
   2) did **not**

D. 1) 105
   2) did **not**

55.

Given the following plant conditions:

- A Large Break LOCA has occurred.
- Reactor Building pressure indicates 34 psig and rising.
- EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION, is in progress.
- The following Containment Isolation Valve MCB Status Light is DIM:
  - CC TO RC CNTMT ISOL 9568 CLSD
- The following annunciators are in alarm:
  - XCP-612 1-1, RB PRESS HI-1 SI/PHASE A
  - XCP-612 3-2, RB SPR ACT
  - XCP-612 4-2, PHASE B ISOL

Which ONE of the choices below completes the following statements?

Phase ___(1)___ signal failed to reposition MVG-9568, TO RB LOAD.

The crew ___(2)___ manually close MVG-9568 from the MCB in accordance with EOP-1.0.

A. 1) "A"
   2) will **not**

B. 1) "A"
   2) will

C. 1) "B"
   2) will **not**

D. 1) "B"
   2) will

56.

Given the following plant conditions:

- A power reduction to 90% power is being performed in accordance with GOP-4B, POWER OPERATION (MODE 1 – DESCENDING).
- Operators are energizing BU GRP 1 Pressurizer Heaters in accordance with SOP-101, REACTOR COOLANT SYSTEM.

Which ONE of the choices below completes the following statements?

In accordance with NOTE 2.0 of SOP-101, when energizing Pressurizer heaters, be aware of the ___(1)___ reactivity effects due to a ___(2)___ void fraction.

A. 1) positive
   2) decreasing

B. 1) positive
   2) increasing

C. 1) negative
   2) decreasing

D. 1) negative
   2) increasing

57.

Initial conditions:

- 75% power initially.
- AFD indications initially are as follows:
  - N-41 0
  - N-42 0
  - N-43 0
  - N-44 0
- Rod Control is in **manual**.

Current conditions:

- A turbine runback occurred.
- Reactor power is now at 60%.
- Operators determined that AFD has exceeded the allowed operational space in accordance with the COLR, CORE OPERATING LIMITS REPORT.

Which ONE of the choices below completes the following statements?

In the **current conditions**, AFD shifted to a ___(1)___ value.

In accordance with Tech Spec 3.2.1, AFD must be restored within a **maximum** time of ___(2)___.

CONSIDER NO OPERATOR ACTIONS

A. 1) positive
   2) 1 hour.

B. 1) positive
   2) 15 minutes.

C. 1) negative
   2) 1 hour.

D. 1) negative
   2) 15 minutes.

58.

Given the following plant conditions:

- 100% power.
- Several Incore Thermocouples have failed in one quadrant of the core.
  - There is one OPERABLE thermocouple in that quadrant.
- All thermocouples in the other three quadrants are OPERABLE.

Which ONE of the choices below completes the following statements?

The accuracy of the heat balance using the Integrated Plant Computer System, QCORE1, ___(1)___ affected by the failed thermocouples.

The requirements of TS 3.3.3.11, POWER DISTRIBUTION MONITORING SYSTEM ___(2)___ met.

A 1) is
2) are

B. 1) is
2) are **not**

C. 1) is **not**
2) are

D. 1) is **not**
2) are **not**

59.

Given the following plant conditions:

- 100% power.
- XFN0064A-AH, REACTOR BLDG COOLING UNIT 1A EMERG FAN has tripped.
- The CRS has sent an AO to investigate the breaker for XFN0064A-AH.

Which ONE of the choices below completes the following statement?

The AO was sent to _____ switchgear to investigate the breaker for XFN0064A-AH.

A. 1DA

B. 1EA

C. 1DA1

D. 1EA1

60.

Given the following plant conditions:

- MODE 6
- Reactor Building Purge is in progress in accordance with SOP-114, REACTOR BUILDING VENTILATION SYSTEM.
- A malfunction of RM-A2, REACTOR BUILDING SAMPLE LINE, causes a spurious RM-A2 High Radiation Alarm.

NOTE the following valve names:

XVB-1A, RB PURGE SUPPLY ISOLATION VALVE

XVB-1B, RB PURGE SUPPLY ISOLATION VALVE

XVB-2A, RB PURGE EXHAUST ISOLATION VALVE

XVB-2B, RB PURGE EXHAUST ISOLATION VALVE

Which ONE of the choices below answers the following question?

Which valves received a **direct** signal to close from the spurious RM-A2 High Radiation Alarm?

A. **Only** XVB-2A and XVB-2B.

B. **Only** XVB-1A and XVB-2A.

C. **Only** XVB-1B and XVB-2B.

D. **Only** XVB-1A and XVB-1B.

61.

Given the following plant conditions:

- Core unloading is in progress.
- “A” train of Spent Fuel Cooling is in service.
- “A” Spent Fuel Cooling pump has tripped.
- AOP-123.4, LOSS OF SPENT FUEL COOLING is in progress.

Which ONE of the choices below completes the following statements?

AOP-123.4, directs operators to ensure ___(1)___ is supplied to each in-service Spent Fuel heat exchanger.

XCP-608 1-3, SFP TEMP HI will alarm at a setpoint of ___(2)___ if cooling is not restored.

A. 1) Service water
   2) 120°F.

B. 1) Component Cooling water
   2) 120°F.

C. 1) Service water
   2) 170°F.

D. 1) Component Cooling water
   2) 170°F.

62.

Given the following plant conditions:

- A core re-load is in progress.
- The JOG PERMISSIVE switch is OFF.

Based on the given conditions, which ONE of the following would render the manipulator crane bridge and trolley inoperative simultaneously?

A. The trolley bypass is engaged.

B. The hoist is being operated or the gripper tube is down.

C. The Reactor Building Upender is in the vertical position (FRAME UP).

D. The Manipulator load cell indicates 100 pounds more than the fuel assembly.

63.

Initial conditions:

- 75% power.
- PT-475, PRESS PSIG, for SG “A” failed high.

Current conditions:

- AOP-401.3, STEAM FLOW-FEEDWATER FLOW PROTECTION CHANNEL FAILURE in progress.
- Manual control of Feedwater Pump speed was required.
- The crew is at the step to “Restore the AFFECTED SG control systems to normal”.

Which ONE of the choices below completes the following statements?

In the **initial conditions**, the reading on FT-474, STM FLOW MPPH ___(1)___.

In the **current conditions**, in accordance with SOP-210, FEEDWATER SYSTEM, prior to restoring Feedwater Pump speed control to automatic, the Feedwater Pump MASTER SPEED CNTRL is adjusted to establish ___(2)___.

A. 1) increased.
   2) all operating Feedwater Pump speeds to within 150 - 250 rpm of each other.

B. 1) increased.
   2) the required DP between Feedwater Pump Discharge and Main Steam Header.

C. 1) decreased.
   2) all operating Feedwater Pump speeds to within 150 - 250 rpm of each other.

D. 1) decreased.
   2) the required DP between Feedwater Pump Discharge and Main Steam Header.

64.

Given the following plant conditions:

- 100% power.
- A release of Waste Monitor Tank #1 was in progress to the Fairfield Penstocks.
- The release was automatically terminated by the closure of RCV-018, LIQUID RADIOACTIVE WASTE CONTROL VALVE.

Which ONE of the following identifies the potential cause for the termination of the release?

A. High radiation detected on RM-L5, LIQUID RAD MON, LIQUID WASTE EFFLUENT.

B. 45% flow at the Fairfield Pumped Storage Facility.

C. Fairfield Pump Storage Facility in the generating mode.

D. High radiation detected on RM-L9, LIQUID RAD MON, LIQUID WASTE EFFLUENT.

65.

Initial conditions:

- 10% power.
- A leak in the Station Air header has occurred.
- Station air header pressure is 62 psig and decreasing.
- Instrument Air header pressure is 67 psig and decreasing.
- XCP-629 1-1, MSIV A NOT FULL OPN 2801A is in alarm
- AOP-220.1, LOSS OF INSTRUMENT AIR, is in progress.

Current conditions:

- Air header pressures are being restored.

Which ONE of the choices below completes the following statements?

In the **initial conditions**, a reactor trip ___(1)___ required in accordance with AOP-220.1.

In the **current conditions**, IPV-8324, STATION AIR SUPPLY HDR PRESS CONT VALVE will be fully open when Instrument Air header pressure **first** reaches ___(2)___ psig.

A. 1) is
   2) 80

B. 1) is
   2) 100

C. 1) is **not**
   2) 80

D. 1) is **not**
   2) 100

66.

Given the following plant conditions:

- Shift turnover has just taken place.

Which ONE of the choices below completes the following statements?

In accordance with OP-AA-100, CONDUCT OF OPERATIONS, operators are required to walk down the entire control board a **minimum** of once ___(1)___.

In accordance with OAP-100.6, CONTROL ROOM CONDUCT AND CONTROL OF SHIFT ACTIVITIES, operators are required to complete Technical Specification Logs within a **maximum** of ___(2)___ hours of taking the shift.

A. 1) each hour.
   2) 1.5

B. 1) each hour.
   2) 2

C. 1) every 2 hours.
   2) 1.5

D. 1) every 2 hours.
   2) 2

67.

Given the following plant conditions:

- A Reactor Operator is determining the requirements to maintain their qualifications in accordance with OP-AA-103, OPERATOR QUALIFICATIONS.
- They stood the following watches during the first quarter of the year:
  - 12 hours on January 5th as BOP.
  - 12 hours on January 29th as RO.
  - 12 hours on February 3th as CB.
  - 12 hours on February 20th as RO.
  - 12 hours on March 10th as RO.
- Today is April 1st.

Which ONE of the choices below completes the following statements in accordance with OP-AA-103?

The Reactor Operators license is ___(1)___.

As a Reactor Operator with an active license, you ___(2)___ required to stand one watch for an entire shift per quarter to maintain proficiency for each previously qualified Auxiliary Operator watchstation.

A. 1) active.
   2) are

B. 1) active.
   2) are **not**

C. 1) inactive.
   2) are

D. 1) inactive.
   2) are **not**

68.

Given the following plant conditions:

- The Refueling SRO reports a dropped fuel assembly in the core.
- Source Range Instruments N-31 and N-33 are in service.
- XCP-620 4-2, SR HI FLUX AT SHUTDN has alarmed.
- AOP-123.3, POTENTIAL FUEL ASSEMBLY DAMAGE WHILE HANDLING FUEL is in progress.

Which ONE of the choices below completes the following statements?

A high reading on N-33 ___(1)___ cause XCP-620 4-2 to alarm.

In accordance with AOP-123.3, ___(2)___ will manually actuate the Reactor Building Evacuation alarm.

A. 1) did **not**
   2) a Control Room operator

B. 1) did **not**
   2) the Fuel Handling Supervisor

C. 1) did
   2) a Control Room operator

D. 1) did
   2) the Fuel Handling Supervisor

69.

Initial conditions:

- A reactor shutdown is in progress in accordance with GOP-4B POWER OPERATION (MODE 1 - DESCENDING).
- C-5, LOW POWER INTERLOCK is bright.

Current condition:

- GOP-5 REACTOR SHUTDOWN FROM STARTUP TO HOT STANDBY (MODE 2 TO MODE 3) is in progress.

Which ONE of the choices below completes the following statements?

In the **initial conditions**, rod control ___(1)___ required to be placed in manual in accordance with GOP-4B.

In the **current conditions**, Reactor power is required to be less than a **maximum** of ___(2)___ to insert control rods with a manual reactor trip in accordance with GOP-5.

A. 1) is **not**
   2) 5%

B. 1) is
   2) 5%

C. 1) is **not**
   2) 3%

D. 1) is
   2) 3%

70.

Which ONE of the choices below answers the following questions?

1) What is the **maximum** amount of time at which LCO 3.0.3 requires actions to be initiated to place the unit in a MODE in which the specification does not apply?

2) What is the **lowest** MODE at which LCO 3.0.3 can direct placing the unit in?

A. 1) 15 minutes
   2) 5

B. 1) 1 hour
   2) 5

C. 1) 15 minutes
   2) 6

D. 1) 1 hour
   2) 6

71.

Given the following plant conditions:

- An AO is going into a room to close a valve.
- The highest dose rate in the room is 107 mrem/hr at 30 cm.
- He has not received any dose for the year.
- The allowed dose is 5 mrem in accordance with the RWP.

Which ONE of the choices below completes the following statements?

In accordance with RP-AA-202, RADIOLOGICAL POSTING, the room the AO is going into is required to be posted as a ___(1)___.

In accordance with VCS-HPP-0403, RADIOLOGICAL CONTROLS FOR NUCLEAR WORK ACTIVITIES, the AO must leave the Radiation Area when their Self-Reading Dosimeter (SRD) **first** reads ___(2)___.

A. 1) Locked High Radiation Area.
   2) 5 mrem.

B. 1) Locked High Radiation Area.
   2) 4 mrem.

C. 1) High Radiation Area.
   2) 5 mrem.

D. 1) High Radiation Area.
   2) 4 mrem.

72.

Given the following plant conditions:

- An AO is entering the RCA to perform a job in a High Radiation Area.
- The AO is reviewing the appropriate Radiation Work Permit (RWP).

Which ONE of the choices below completes the following statements?

Prior to entering the High Radiation Area, the operator ___(1)___ required to receive a brief from HP.

The RWP ___(2)___ contain recommended Protective Clothing (PCs) based on expected contamination levels for the work to be performed.

A. 1) is
   2) will

B. 1) is
   2) will **not**

C. 1) is **not**
   2) will

D. 1) is **not**
   2) will **not**

73.

Which ONE of the choices below answers the following questions in accordance with OAP-103.4, EOP-FSP-AOP-ARP USER'S GUIDE?

1) What is the **minimum** RB pressure at which adverse containment values are used?

2) Once RB pressure drops below the adverse value setpoint, are adverse containment values required to be used?

A. 1) 3.6 psig.
   2) Yes.

B. 1) 3.6 psig.
   2) No.

C. 1) 6.35 psig.
   2) Yes.

D. 1) 6.35 psig.
   2) No.

74.

Which ONE of the following describes the performance criteria for instructional sub steps proceeded by bullets (•) in an AOP?

A. The steps are immediate operator action steps.

B. The steps may be performed in any order.

C. The steps shall be performed in sequential order.

D. The steps are continuous action steps.

75.

What color is the **highest** priority annunciator window?

A. Red

B. Blue

C. Yellow

D. White

76.

Given the following plant conditions:

Time 1000:

- 100% power initially.
- A large break LOCA occurred.
- “A” SG is faulted inside containment.
- RB pressure was 15 psig and increasing.

Time 1018:

- RB pressure was 50 psig and increasing.
- Core exit TCs were 750°F and increasing.
- NR RVLIS was 30% and decreasing.
- The crew is attempting to restore Safety Injection.

Time 1033:

- Core exit TCs were 850°F and increasing.
- RB Pressure has peaked at 53 psig.
- NR RVLIS is 27% and decreasing.
- All attempts to restore core cooling have failed.

Which ONE of the choices below completes the following statements in accordance with VCS-EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN?

The **highest** EAL declaration for this event was a ___(1)___.

Conditions for the **highest** EAL declaration were **first** met at time ___(2)___.

Do **not** consider Emergency Director Judgment as a basis for your emergency classification.

REFERENCE PROVIDED

A. 1) Site Area Emergency.
   2) 1018.

B. 1) Site Area Emergency.
   2) 1033.

C. 1) General Emergency.
   2) 1018.

D. 1) General Emergency.
   2) 1033.

77.

Given the following plant conditions:

Time 0700:

- 35% power.
- GOP-4A, POWER OPERATION (MODE 1-ASCENDING) is in progress.
- Number two seal on RCP “A” has failed.
- AOP-101.2, REACTOR COOLANT PUMP SEAL FAILURE is in progress.
- Total seal leakage is 11 gpm.

Time 0750:

- MODE 3.
- RCP “B” tripped at the same time the plant was placed in MODE 3.

NOTE the following procedure titles:

EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION

GOP-4B, POWER OPERATION (MODE 1-DESCENDING)

GOP-4C, RAPID POWER REDUCTION

Which ONE of the choices below completes the following statements?

At **time 0700**, the **next** procedure transition will be to ___(1)___ in accordance with AOP-101.2.

At **time 0750**, in accordance with Technical Specification 3.4.1.2, REACTOR COOLANT SYSTEM, HOT STANDBY, a **minimum** of ___(2)___ Reactor Coolant loop(s) shall be OPERABLE **without** relying on an action statement.

A. 1) EOP-1.0.
   2) 2

B. 1) EOP-1.0.
   2) 1

C. 1) GOP-4B or GOP-4C.
   2) 2

D. 1) GOP-4B or GOP-4C.
   2) 1

78.

Given the following plant conditions:

Time 1800:

- 100% power.
- Diesel Generator B is tagged out for maintenance.
- Battery charger XBC1A-1B is being aligned to battery XBA1A.

Time 2130:

- The following alarms come in on XCP-636:
  - DG A LOSS OF DC.
  - TRAIN A BATT CHGR TRBL XBC 1A/1A-1B.
  - DC SYS TRAIN A GND TRBL.
  - DC SYS OVRVOLT/UNDRVOLT.
  - 7KV ESF CHAN A LOSS OF DC.
  - 480V ESF CHAN A LOSS OF DC.

Time 2200:

- AOP-600.1, CONTROL ROOM EVACUATION is in progress due to a bomb threat in the Control Room.
- A lockout occurs on Bus 1DX.

Time 2230:

- DC power was restored to “A” DG.
- “A” DG failed to autostart.

Which ONE of the choices below answers the following questions?

1) Based on the conditions **at 2200**, which Tech Spec LCO is applicable and requires the **earliest** entry into Cold Shutdown?

2) At **time 2230**, what method will the BOP **first** use to locally start the “A” Diesel Generator in accordance with AOP-600.1?

REFERENCE PROVIDED

A. 1) TS 3.0.3.
   2) EMERG START Pushbutton.

B. 1) TS 3.0.3.
   2) The Main Air Start Valve.

C. 1) TS 3.8.1.1.
   2) EMERG START Pushbutton.

D. 1) TS 3.8.1.1.
   2) The Main Air Start Valve.

79.

Given the following plant conditions:

Time 1100, 5/1

- MODE 1.
- "A" Service Water pump is running.
- "B" Service Water pump is running.
- “C” Service Water pump Breaker has just been racked-up on the “B” Train.

Time 1110, 5/1

- “C” Service Water pump has been started.
- “B” Service Water pump has been secured, the breaker has **not** been racked down.

Time 1115, 5/1

- A break occurs in the line just downstream of XVB-3116C-SW, SER WTR PUMP C DISCHG VLV.
- “B” Train Service Water header pressure is 20 psig.
- “B” Service Water pump can **not** be started.

Which ONE of the choices below completes the following statements?

The “B” Service Water loop is separated by ___(1)___ cross connect isolation valve(s) from the “C” Service Water pump.

The **latest** time by which the plant must be taken to COLD SHUTDOWN in accordance with Technical Specification 3.7.4, SERVICE WATER SYSTEM is ___(2)___ on 5/5.

REFERENCE PROVIDED

A. 1) 1
   2) 2315

B. 1) 1
   2) 2300

C. 1) 2
   2) 2315

D. 1) 2
   2) 2300

80.

Given the following plant conditions:

Time 0700:

- 50% power and stable.
- Electric Plant is in a normal operating alignment.
- AOP-301.1, RESPONSE TO ELECTRICAL GRID ISSUES is in progress.
- AC MEGAVARS meter is at 335 MVARs and increasing.

Time 0800:

- AOP-301.1, Attachment 4, SYSTEM CONTROLLER OPERABILITY/RISK INCREASE NOTIFICATION indicates the following for the **present** conditions:
  - PARR 115 KV BUS 2 OFF-LINE voltage is 105.6 KV.
  - VCS 230 KV BUS 2 OFF-LINE voltage is 230.5 KV.

Time 0805:

- AOP-301.1, Attachment 4 indicates the following for the **predicted** conditions:
  - There is a Single Failure Contingency that would cause both offsite power sources to be outside their voltage limits.

Time **now** is 0810:

Which ONE of the choices below completes the following statements?

At time **0700**, MVARs ___(1)___ within the administrative limits in accordance with SOP-301, MAIN GENERATOR SYSTEM.

At time **0810**, T.S. 3.8.1.1, AC SOURCES ___(2)___ is required to be implemented.

REFERENCES PROVIDED

A. 1) are
   2) Action a.

B. 1) are
   2) Action d.

C. 1) are **not**
   2) Action a.

D. 1) are **not**
   2) Action d.

81.

Initial conditions:

- All three Steam Generators are faulted.
- Operators have started a cooldown in accordance with EOP-3.1, ECA-2.1 UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS.

Current conditions:

- MDEFW Pumps “A” and “B” breakers tripped.
- The TDEFW Pump tripped.
- RCS pressure and temperature are at 400 psig and 340°F, respectively
- SGs pressures are at 120 PSIG.
- The crew has just entered EOP-15, FR-H.1 RESPONSE TO A LOSS OF SECONDARY HEAT SINK.

NOTE the following procedure titles:

SOP-115, RESIDUAL HEAT REMOVAL

GOP-6 PLANT SHUTDOWN FROM HOT STANDBY TO COLD SHUTDOWN (MODE 3 TO MODE 5)

Which ONE of the choices below completes the following statement?

In the **current conditions**, a secondary heat sink ___(1)___ required and the crew will ___(2)___.

A. 1) is
   2) continue in EOP-15.0 and **first** try to establish feed flow using Main Feedwater Booster pumps.

B. 1) is
   2) continue in EOP-15.0 while establishing RHR Cooling in accordance with SOP-115.

C. 1) is **not**
   2) return to EOP-3.1 and establish RHR Cooling in accordance with SOP-115.

D. 1) is **not**
   2) return to EOP-3.1 and **first** refer to GOP-6 to shutdown the plant.

82.

Time 0800 on 9/1:

- 65% power.
- Control Bank D rod H-14 dropped.
- I&C reports that repairs will take 6 days based on parts availability.
- OPS Management has determined that the plant will remain at power.

Time 1100 on 9/7:

- The crew is recovering Rod H-14.
- XCP-621 2-2, DRPI ALARM NON-URGENT is in alarm.
- A failure of the Data “A” cabinet has occurred.

Which ONE of the choices below completes the following statements?

In accordance with the **bases** for T.S. 3.1.3, MOVABLE CONTROL ASSEMBLIES confirmation that safety analyses will remain valid while the plant remains at power will be provided by ___(1)___.

During the recovery of the control rod, the accuracy of DRPI is ___(2)___ steps from actual rod position.

A. 1) reevaluating those Safety analyses that are affected by rod misalignment.
   2) +4 to -10

B. 1) verifying remaining rods are above Rod Insertion Limits.
   2) +4 to -10

C. 1) reevaluating those Safety analyses that are affected by rod misalignment.
   2) -4 to +10

D. 1) verifying remaining rods are above Rod Insertion Limits.
   2) -4 to +10

83.

Given the following plant conditions:

- 100% power.
- A leak began from the RCS to the "B" Steam Generator (SG).
- AOP-112.2, STEAM GENERATOR TUBE LEAK NOT REQUIRING SI COOLANT, was just entered.
- FCV-122, CHG FLOW is full open.

Which ONE of the choices below completes the following statements?

In accordance with AOP-112.2, operators are required to manually start a second CCW pump and Charging pump if PZR level ___(1)___.

The **highest** offsite dose that is calculated to occur for the leak from the RCS to the "B" SG, in accordance with the bases for T.S. 3.4.6.2, REACTOR COOLANT SYSTEM - OPERATIONAL LEAKAGE, would be due to ___(2)___.

A. 1) reaches 8%.
   2) an unisolable main steam line break on "B" SG to the atmosphere outside of the RB.

B. 1) reaches 8%.
   2) a cooldown using "B" SG to the atmosphere when it is the **only** SG available.

C. 1) is decreasing with Letdown isolated.
   2) an unisolable main steam line break on "B" SG to the atmosphere outside of the RB.

D. 1) is decreasing with Letdown isolated.
   2) a cooldown using "B" SG to the atmosphere when it is the **only** SG available.

84.

Initial conditions:

- A Small Break LOCA has occurred.
- EOP-2.1, ES-1.2 POST-LOCA COOLDOWN AND DEPRESSURIZATION, is in progress.
- All RCPs were secured.
- The crew has determined the priority is to start RCP “A” first.

Current conditions:

- RWST level is 17% and lowering.
- “A” SG level is 46% and rising uncontrollably.

NOTE the following procedure titles:

EOP-2.2, ES-1.3, TRANSFER TO COLD LEG RECIRCULATION

EOP-4.0, E-3, STEAM GENERATOR TUBE RUPTURE

Which ONE of the choices below completes both of the following statements in accordance with EOP-2.1 and its background document?

In the **initial conditions**, the basis for starting RCP “A” **first** is to ___(1)___.

In the **current conditions**, the crew is required to go to ___(2)___.

A. 1) provide the best Pressurizer spray flow.
   2) EOP-2.2 and verify transfer to Cold Leg Recirculation mode.

B. 1) provide the best Pressurizer Spray flow.
   2) EOP-4.0 and isolate the Ruptured “A” SG.

C. 1) ensure “B” or “C” RCP is available for future use.
   2) EOP-2.2 and verify transfer to Cold Leg Recirculation mode.

D. 1) ensure “B” or “C” RCP is available for future use.
   2) EOP-4.0 and isolate the Ruptured “A” SG.

85.

Given the following plant conditions:

Time 1500:

- A Small Break LOCA has occurred.

Time 1510:

- EOP-2.0, E-1 LOSS OF REACTOR OR SECONDARY COOLANT is in progress.

Time 1520:

- Crew enters EOP-16.0, FR-P.1 RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK.

Time 1530:

- RCS subcooling is 72.5°F and stable.
- RCS pressure is 150 psig and stable.
- The CRS has determined that an RCS Temperature Soak is required.

Which ONE of the choices below completes the following statement in accordance with EOP-16.0?

The **minimum** time for the required RCS Temperature soak is ___(1)___.

EOP-16.0 ___(2)___ allow the CRS to return to EOP-2.0 and perform actions that do not cooldown or increase RCS pressure during the RCS Temperature soak.

A. 1) 4 hours
   2) does

B. 1) 4 hours
   2) does **not**

C. 1) 1 hour
   2) does

D. 1) 1 hour
   2) does **not**

86.

Initial conditions:

- Plant is shutdown for an extended outage.
- MODE 5.
- **Monthly** STP-105.008, CHARGING PUMP BREAKER POSITION VERIFICATION was completed sat at time **0700 on 3/1**.

Current conditions:

- MODE 5 with the RCS intact.
- The CRS is reviewing STP-105.008 and the following results were listed:

PUMP Correction: IN to INJ	BREAKER	PUMP BREAKER POSITION
CHARGING ~~IN~~ PUMP A XPP0043A-CS	XSW1DA 05	Racked up
CHARGING ~~IN~~ PUMP B XPP0043B-CS	XSW1DB 15	Racked down
CHARGING ~~IN~~ PUMP C XPP0043B-CS Correction: B to C	XSW1DA 06	Racked down
	XSW1DB 14	Racked up

Which ONE of the choices below completes the following statements?

The **latest** time at which STP-105.008 is allowed to be performed next in compliance with the provisions of Technical Specification Section 4.0, SURVEILLANCE REQUIREMENTS ___(1)___ 0700 on 4/9.

In the **current conditions**, Charging pump breaker positions ___(2)___ meet the LCO for Tech Spec 3.4.9.3, OVERPRESSURE PROTECTION SYSTEMS, **without** reliance on an action statement.

REFERENCE PROVIDED

A. 1) is
   2) do

B. 1) is **not**
   2) do **not**

C. 1) is **not**
   2) do

D. 1) is
   2) do **not**

87.

Given the following plant conditions:

- 100% power.
- A spurious failure has caused Train “A” of ESFAS Instrumentation, Functional Unit (Item) 5.b, TURBINE TRIP & FEEDWATER ISOLATION – Automatic Actuation Logic and Actuation Relays, to be declared INOPERABLE.
- The “A” Motor Driven EFW pump is scheduled to be tagged out for an elective maintenance task this shift.

Which ONE of the choices below completes the following statements?

Tag out of “A” Motor Driven EFW pump ___(1)___ be allowed at this time in accordance with the basis for T.S. 3.3.1 and 3.3.2, REACTOR TRIP AND ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION.

An AMSAC actuation from Train “A” ___(2)___ currently inhibited.

A. 1) should
   2) is

B. 1) should
   2) is **not**

C. 1) should **not**
   2) is

D. 1) should **not**
   2) is **not**

88.

Initial conditions:

- A prolonged loss of all offsite power (115 KV and 230 KV) has occurred.
- Both EDGs failed to start.
- All main and emergency feedwater capability had been lost.

Current conditions:

- Operators are checking for an ELAP in accordance with EOP-6.0, ECA-0.0 LOSS OF ALL ESF AC POWER.
- All Narrow Range steam generator levels are 9% and decreasing.
- RCS subcooling is 45°F.

NOTE the following procedure titles:

EOP-6.2, ECA-0.2 LOSS OF ALL ESF AC POWER RECOVERY WITH SI REQUIRED.

EOP-15.0, FR-H.1 RESPONSE TO A LOSS OF SECONDARY HEAT SINK.

Which ONE of the choices below answers both of the following questions?

1) When power is restored, which procedure is required to be transitioned to **next**?

2) When power is restored, will Motor Driven EFW pumps automatically start?

A. 1) EOP-6.2.
   2) No.

B. 1) EOP-6.2.
   2) Yes.

C. 1) EOP-15.0.
   2) No.

D. 1) EOP-15.0.
   2) Yes.

89.

Initial conditions:

- MODE 5.
- RHR is in service.
- The Pressurizer manway is removed.
- “A” Charging Pump is in service.
- AOP-117.1, LOSS OF SERVICE WATER is in progress.

Current conditions:

- CCW header temperature is 125°F and increasing.
- RHR loops cannot be restored.
- RCS temperature is 202°F and increasing.

Which ONE of the choices below completes both of the following statements?

While continuing on in AOP-117.1, the crew will also perform actions of ___(1)___.

In the **current conditions**, Hot Leg Injection ___(2)___ required to be established.

A. 1) AOP-115.3, LOSS OF RHR WITH THE RCS INTACT.
   2) is **not**

B. 1) AOP-115.5, LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6).
   2) is **not**

C. 1) AOP-115.3, LOSS OF RHR WITH THE RCS INTACT.
   2) is

D. 1) AOP-115.5, LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6).
   2) is

90.

Given the following plant conditions:

Time 0800:

- 100% power.
- While shifting orifices, XVT-8149C, LTDN ORIFICE C ISOL failed to close.
- The action statement for LCO 3.6.4, CONTAINMENT ISOLATION VALVES was entered.

Time 0815:

- The crew is isolating Normal Letdown and putting Excess Letdown in service in accordance with SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM.
- A reactor building entry will **not** occur.
- PVT-8152, LTDN LINE ISOL is closed.

Time 0830:

- PVT-8152 has been de-energized.

Which ONE of the choices below completes the following statements?

In accordance with SOP-102, core power is maintained less than a **maximum** of ___(1)___ MWt while Excess Letdown is in service.

At **time 0830**, LCO 3.6.1.1, CONTAINMENT INTEGRITY ___(2)___ met.

A. 1) 2898
   2) is **not**

B. 1) 2898
   2) is

C. 1) 2900
   2) is **not**

D. 1) 2900
   2) is

91.

Given the following plant conditions:

Time 0700:

- 100% power initially.
- A turbine load rejection has occurred.
- AOP-214.2, RESPONSE TO LOAD REJECTION/RUNBACK is in progress.

Time 0705:

- 90% power and stable.
- XCP-620, 5-1 ROD CNTRL SYS FAIL URGENT is in alarm.
- XCP-621 1-1, CRB INSERT LMT LO-LO is in alarm.

Which ONE of the choices below completes the following statements?

At time **0705**, Boration was initiated using procedure steps in ___(1)___.

A power change greater than 15% within a **maximum** of ___(2)___ hour(s) requires Chemistry to be notified.

A. 1) AOP-106.1, EMERGENCY BORATION.
   2) one

B. 1) AOP-214.2.
   2) one

C. 1) AOP-106.1, EMERGENCY BORATION.
   2) two

D. 1) AOP-214.2.
   2) two

92.

Given the following plant conditions:

Time 1000:

- 100% power.
- The Supplemental Air Compressor is tagged out.
- I&C is troubleshooting the controllers for the Pressurizer Spray valves.
- Auxiliary spray is in service in accordance with SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM.

Time 1025:

- XCP-606, 2-5 RB AIR HDR PRESS LO is in alarm.
- XCP-607, 2-5 INSTR AIR PRESS LO FLO HI is in alarm.
- PI-8342, INST AIR HDR PRESS, is reading 60 psig, lowering slowly.
- The Diesel Air compressor is **not** running.
- LCV-459 and LCV-460, LTDN LINE ISOL have drifted closed.

Time 1045:

- RB and Instrument air header pressures have been restored.
- EOP-1.1, ES-0.1 REACTOR TRIP RESPONSE is in progress.

Which ONE of the choices below completes the following statements?

At **time 1000**, Pressurizer level is being controlled in ___(1)___ in accordance with SOP-102.

At **time 1045**, Auxiliary Spray will be restored using procedure steps in ___(2)___.

A. 1) automatic.
   2) SOP-102.

B. 1) automatic.
   2) EOP-1.1.

C. 1) manual.
   2) SOP-102.

D. 1) manual.
   2) EOP-1.1.

93.

Given the following plant conditions:

- MODE 3.
- T_{AVG} is 557°F, stable and has remained unchanged.
- XCP-616, 1-5, PZR LCS DEV HI/LO is in alarm.
- Pressurizer level indications are as follows:

  LI-459A 25%, stable.

  LI-460 20%, stable.

  LI-461 20%, stable.
- FCV-122, CHG FLOW controller is in AUTO, output is 36%, stable and has remained unchanged.

Which ONE of the choices below completes the following statements in accordance with T.S. 3.3.1, REACTOR TRIP INSTRUMENTATION?

The **minimum** OPERABLE Channels requirement for the High Pressurizer Level trip function ___(1)___ met for MODE 1.

The **highest** plant MODE in which the plant is allowed in accordance with Technical Specifications in the conditions above is ___(2)___.

Assume any Technical Specification action statement in effect is satisfied.

REFERENCE PROVIDED

A. 1) is
   2) MODE 1.

B. 1) is **not**
   2) MODE 1.

C. 1) is **not**
   2) MODE 2.

D. 1) is **not**
   2) MODE 3.

94.

Given the following plant conditions:

- STP-131.001 MANIPULATOR CRANE TEST is complete.
- MODE 6 with fuel movement in progress.
- An interlock is required to be bypassed on the Upender in the Fuel Handling Building.

Which ONE of the choices below completes the following statements?

The Manipulator Crane must be demonstrated OPERABLE within ___(1)___ hours of fuel movement in the reactor.

Bypassing a Fuel Handling Building Upender interlock ___(2)___ require Refueling SRO concurrence.

A. 1) 146
   2) does

B. 1) 146
   2) does **not**

C. 1) 100
   2) does

D. 1) 100
   2) does **not**

95.

Time 0730, 8/23:

- MODE 4.
- Plant cooldown in progress.
- "A" CCW train is the active train.
- A suspected maintenance problem on **only** CCW pump breakers will require a visual inspection of **each** breaker to determine if they are OPERABLE.
- "B" CCW Pump, is racked down and tagged out.
- The "B" CCW pump breaker is visually inspected without any disassembly.
- **No** defects are found on "B" CCW pump breaker.

Time 1030, 8/23:

- "B" CCW Pump tags are cleared and breaker racked up.
- "B" CCW Pump is declared OPERABLE.

Time 1130, 8/23:

- Visual inspection of "A" and "C" CCW Pump breakers determines that they are **both inoperable**.

Which ONE of the choices below answers both of the following questions?

In accordance with OAP-100.5, GUIDELINES FOR CONFIGURATION CONTROL AND OPERATION OF PLANT EQUIPMENT, at **time 1030**, a test start of "B" CCW pump ___(1)___ required to establish OPERABILITY of that pump.

The **latest** time by which the plant must be in MODE 5 is ___(2)___.

REFERENCE PROVIDED

A. 1) was
   2) 1330 on 8/24

B. 1) was
   2) 1730 on 8/27

C. 1) was **not**
   2) 1330 on 8/24

D. 1) was **not**
   2) 1730 on 8/27

96.

Given the following plant conditions:

- Plant is in MODE 5 being cooled down for an outage.
- An Outage R&R was written in accordance with SAP-0205, STATUS CONTROL AND REMOVAL AND RESTORATION.

Which ONE of the choices below completes the following statements in accordance with SAP-0205, STATUS CONTROL AND REMOVAL AND RESTORATION?

An Outage R&R was written because the system or component has an LCO which ___(1)___ applicable in MODES 5 or 6.

The Control Room Supervisor performs an audit of the R&R Logbook ___(2)___ in accordance with Attachment IV, SYSTEM STATUS CONTROLS AUDIT SHEET.

A. 1) is **not**
   2) daily

B. 1) is
   2) daily

C. 1) is **not**
   2) monthly

D. 1) is
   2) monthly

97.

Given the following plant conditions:

Time 0900 on 8/20:

- Waste Gas Decay Tank "H" sampled.
- A Release Permit was approved for a release of Waste Gas Decay Tank (WGDT) "H".
- WGDT "H" pressure 25 psig.

Time 0945 on 8/20:

- Release was commenced.

Time 1300 on 8/20:

- The release was secured due to a malfunction with the control valve.

Time 0200 on 8/21:

- The control valve has been repaired.
- WGDT "H" is aligned for release.
- WGDT "H" pressure 16 psig.
- RM-A3 reading Normal background.
- Wind direction From the East - Southeast.

Which ONE of the choices below completes the following statements?

The release of WGDT “H” ___(1)___ required to be **completed** within 24 hours of the sample at **0900 on 8/20**.

At time **0200 on 8/21**, the release ___(2)___ be re-commenced.

A. 1) is
   2) can

B. 1) is **not**
   2) can

C. 1) is
   2) can **not**

D. 1) is **not**
   2) can **not**

98.

Given the following plant conditions:

- The plant is in MODE 3.
- The following Reactor Building Cooling Units are running in **NORM**:
  - XFN-64A, REACTOR BLDG COOLING UNIT 1A EMERG.
  - XFN-64B, REACTOR BLDG COOLING UNIT 1B EMERG.
  - XFN-65B, REACTOR BLDG COOLING UNIT 2B EMERG.
- XFN-65A, REACTOR BLDG COOLING UNIT 2A EMERG is tagged out for motor bearing failure.
- XCP-606, 1-5 RBCU 1A FAN VIBR HI, is in alarm.

Which ONE of the choices below completes the following statements?

XFN-64A ___(1)___ automatically trip because of XCP-606, 1-5 being in alarm.

The basis for maintaining OPERABILITY of the containment filter trains ensures that sufficient iodine removal capability is available to maintain ___(2)___.

A. 1) did
   2) offsite exposures due to containment leakage within limits.

B. 1) did **not**
   2) offsite exposures due to containment leakage within limits.

C. 1) did
   2) Control Room exposure < 5 rem for 30 days after a design basis accident.

D. 1) did **not**
   2) Control Room exposure < 5 rem for 30 days after a design basis accident.

99.

Given the following plant conditions:

- The Shift Manager has declared an ALERT on a Saturday at 2000.
- The Operations Lead, a fully qualified AO, has been established in the appropriate support center.
- The Operational Support Center (OSC) and Technical Support Center (TSC) are activated.
- The Control Room requires an EOP attachment with local actions to be performed.

Which ONE of the choices below completes the following statements in accordance with VCS-EPP-0028, OPERATIONAL SUPPORT CENTER?

The Operations Lead was established in the ___(1)___.

In the conditions above, the Control Room is required to ___(2)___.

A. 1) TSC
   2) direct all field operations through the OSC or TSC.

B. 1) OSC
   2) direct all field operations through the OSC or TSC.

C. 1) TSC
   2) directly contact the necessary field personnel to perform the local actions.

D. 1) OSC
   2) directly contact the necessary field personnel to perform the local actions.

100.

Given the following plant conditions:

- A General Emergency has been declared.
- Protective Action Recommendations (PARs) have been determined.
- An Evacuation recommendation has been given.

Which ONE of the choices below completes the following statements in accordance with VCS-EPP-0001.4, GENERAL EMERGENCY?

Once an evacuation recommendation for an area has been given, it ___(1)___ be changed to a shelter recommendation.

The Shift Manager will be relieved as the Interim Emergency Director (IED) upon activation of the ___(2)___.

A. 1) can
   2) TSC.

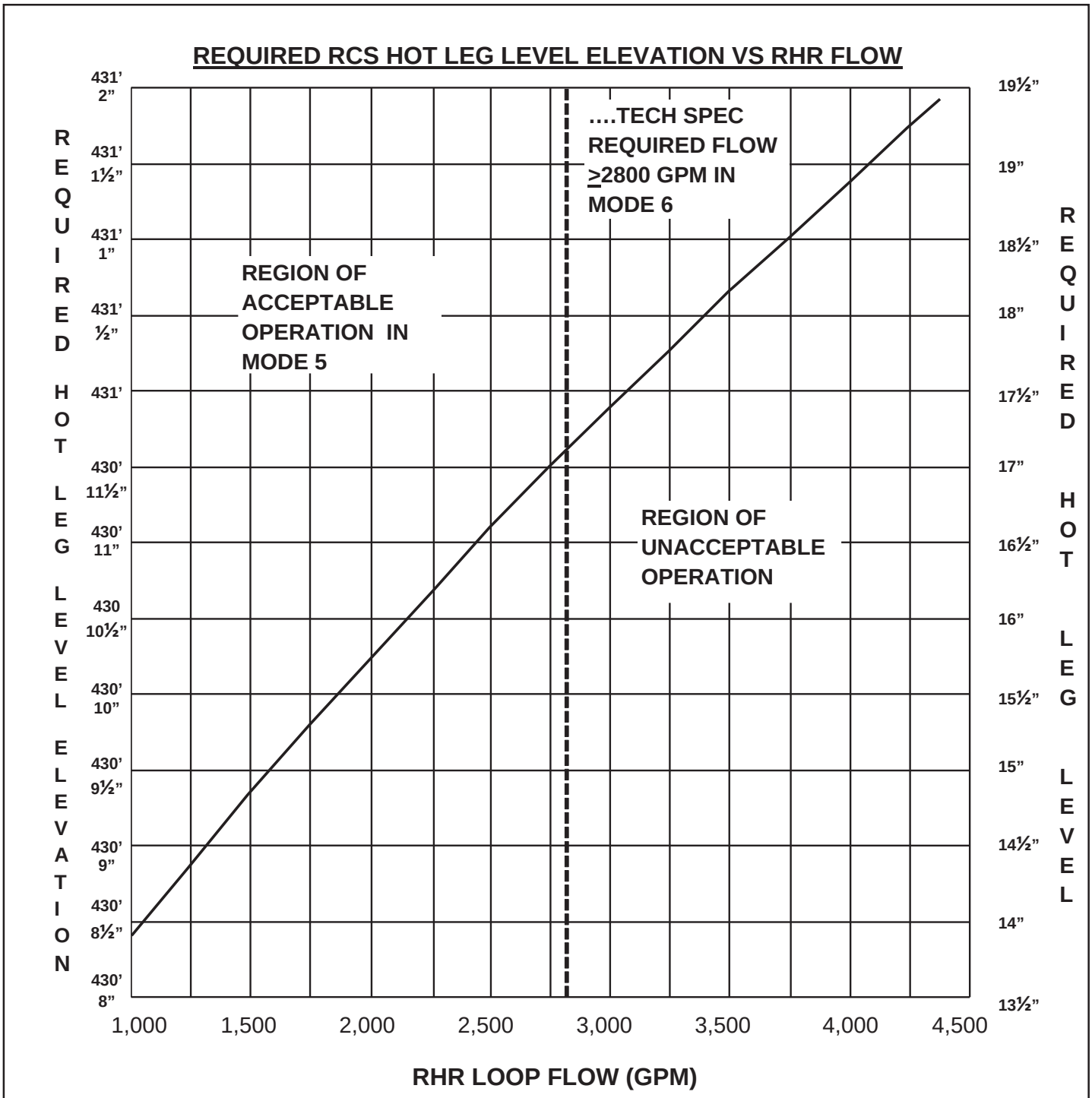
B. 1) can **not**
   2) TSC.

C. 1) can
   2) EOF.

D. 1) can **not**
   2) EOF.

TABLE OF CONTENTS
2021 NRC SRO EXAM

REQUIRED RCS HOT LEG LEVEL VS RHR FLOW



3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and

b. Two separate and independent Emergency Diesel Generators (EDG), each with:

1. A separate day fuel tank containing a minimum volume of 360 gallons of fuel,

2. A separate fuel storage system containing a minimum volume of 48,500 gallons of fuel, and

3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With one offsite circuit of 3.8.1.1.a inoperable:

1. Demonstrate the OPERABILITY of the remaining offsite A.C. sources by performing Surveillance Requirement 4.8.1.1.1 within 1 hour and at least once per 8 hours thereafter, and

2. If either EDG has not been successfully tested within the past 24 hours, demonstrate its OPERABILITY by performing Surveillance Requirement 4.8.1.1.2.a.3 separately for each such EDG within 24 hours unless the diesel is already operating, and

3. Restore the offsite circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

b. With one EDG of 3.8.1.1.b inoperable:

1. Demonstrate the OPERABILITY of the A.C. offsite sources by performing Surveillance Requirement 4.8.1.1.1 within 1 hour and at least once per 8 hours thereafter, and

2. *If the EDG became inoperable due to any cause other than preplanned preventive maintenance or testing:

a) determine the OPERABLE EDG is not inoperable due to a common cause failure within 24 hours, or

b) demonstrate the OPERABILITY of the remaining EDG by performing Surveillance Requirement 4.8.1.1.2.a.3 within 24 hours,

and

* Completion of Action b.2 is required regardless of when the inoperable EDG is restored to OPERABILITY.

ACTION: (Continued)

3. Within 4 hours, verify that required systems, subsystems, trains, components and devices that depend on the remaining EDG as a source of emergency power are also OPERABLE and in MODE 1, 2, or 3, that the Turbine Driven Emergency Feed Pump is OPERABLE. If these conditions are not satisfied within 4 hours be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

4. Restore the EDG to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours, unless the following condition exists:

   a) The requirement for restoration of the EDG to OPERABLE status within 72 hours may be extended to 14 days if the Alternate AC (AAC) power source is or will be available within 1 hour, as specified in the Bases, and

   b) If at any time the AAC availability cannot be met, either restore the AAC to available status within the remainder of the 72 hours in 4.a (not to exceed 14 days from the time the EDG originally became inoperable), or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the next 30 hours.

c. With one offsite circuit and one EDG inoperable:

1. Demonstrate the OPERABILITY of the remaining offsite A.C. source by performing Surveillance Requirement 4.8.1.1.1 within one hour and at least once per 8 hours thereafter, and

2. *If the EDG became inoperable due to any cause other than preplanned preventative maintenance or testing:
   a) determine the OPERABLE EDG is not inoperable due to a common cause failure within 8 hours, or
   b) demonstrate the OPERABILITY of the remaining EDG by performing Surveillance Requirement 4.8.1.1.2.a.3 within 8 hours,

   and

3. Within 2 hours, verify that required systems, subsystems, trains, components and devices that depend on the remaining EDG as a source of emergency power are also OPERABLE and in MODE 1, 2, or 3, that the Turbine Driven Emergency Feed Pump is OPERABLE. If these conditions are not satisfied within 2 hours be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

4. Restore one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours, and

5. Restore the other A.C. power source (offsite circuit or diesel generator) to OPERABLE status in accordance with the provisions of Section 3.8.1.1 Action Statement a. or b., as appropriate, with the time requirement of that Action Statement based on the time of initial loss of the remaining inoperable A.C. power source.

* Completion of Action c.2 is required regardless of when the inoperable EDG is restored to OPERABILITY.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

d. With two of the required offsite A. C. circuits inoperable:

1. Demonstrate the OPERABILITY of the two EDG's by sequentially performing Surveillance Requirement 4.8.1.1.2.a.3 on both within 8 hours, unless the EDG's are already operating, and

2. Restore one of the inoperable offsite sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours.

3. Following restoration of one offsite source, follow Action Statement a. with the time requirement of that Action Statement based on the time of initial loss of the remaining inoperable offsite A.C. circuit.

e. With two of the above required EDG's inoperable:

1. Demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1 within one hour and at least once per 8 hours thereafter, and

2. Restore one of the inoperable EDG's to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

3. Following restoration of one EDG, follow Action Statement b. with the time requirement of that Action Statement based on the time of initial loss of the remaining inoperable diesel generator.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be determined OPERABLE at least once per 7 days by verifying correct breaker alignment and indication of power availability for each Class 1E bus and its preferred offsite power source.

PLANT SYSTEMS

3/4.7.4 SERVICE WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4 At least two independent service water loops shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one service water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.4 At least two service water loops shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

OFFSITE POWER SOURCE VOLTAGE LIMITS

Transformer(s)	Connected Buses	Allowable Range of Offsite AC KILOVOLTS (XCP-6117, ESF XFMR FEED KV)		
115 KV Source		Generator On Line (≤330 MVAR)	Generator On Line (>330 MVAR to ≤484 MVAR)	Generator Off Line
XTF-4 with XTF-6 (6)	1DA (1) or 1DB (5)	105.5 to 131.3	106.4 to 131.3	102.3 to 131.3
XTF-4 with XTF-6 (6)	1DA and 1DB (3)	112.8 to 131.3	113.7 to 131.3	109.5 to 131.3
XTF-4 and XTF-5	1DA (2) or 1DB (2) (5)	113.4 to 119.8	113.4 to 119.8	109.3 to 119.8
XTF-4 and XTF-5	1DA and 1DB (2) (3)	114.8 to 119.8	115.7 to 119.8	111.6 to 119.8
XTF-4 or XTF-5	1DA (2) or 1DB (5)	114.7 to 119.8	115.6 to 119.8	111.5 to 119.8
XTF-4 or XTF-5	1DA and 1DB (2) (3)	119.5 to 119.8 (4)	119.5 to 119.8 (4)	117.5 to 119.8
230 KV Source		(XCP-6118, INCOMING 230 KV BUS)		
XTF-31	1DB (1) or 1DA (5)	225.7 to 239.6	228.4 to 239.6	218.3 to 239.6
XTF-31	1DA and 1DB (3)	233.0 to 239.6	235.8 to 239.6	225.7 to 239.6
XTF-31	1DB and 1C or 1DA and 1C (5)	226.4 to 239.6	229.1 to 239.6	219.0 to 239.6
XTF-31	1DA, 1DB, and 1C (3)	233.7 to 239.6	236.5 to 239.6	226.4 to 239.6

NOTES and ACTIONS on page 2 of this attachment.

OFFSITE POWER SOURCE VOLTAGE LIMITS

NOTES:	ACTIONS:
(1) Normal operating alignment. (2) Used only if regulator is out of service. (3) Maintenance only, LCO in effect, if in Modes 1-4. (4) MVAR Limits in parenthesis (330 and 484 MVARs) do not apply. **Limit MVAR generation output to 170 MVARs.** (5) Alternative operating alignment. (6) XTF-6 is functionally capable of automatic (or manual) stepping to maintain 7.2 KV bus voltages.	115KV: 1. If voltage falls below the lower limit, declare the 115 KV bus inoperable and notify the System Controller. 2. If voltage exceeds the upper limit, notify the System Controller and begin logging 7.2 KV bus voltages each hour. 3. If during logging, 7.45 KV is exceeded, declare the 115 KV bus inoperable and notify the System Controller.
	230KV: 1. If voltage falls below the lower limit, declare the 230 KV bus inoperable and notify the System Controller. 2. If voltage exceeds the upper limit, notify the System Controller and begin logging 7.2 KV bus voltages each hour. 3. If during logging, 7.45 KV is exceeded, declare the 230 KV bus inoperable and notify the System Controller.

March 2021

March 2021

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

April 2021

Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Feb 28	Mar 1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	Apr 1	2	3

April 2021

April 2021

Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

May 2021

Su	Mo	Tu	We	Th	Fr	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Mar 28	29	30	31	Apr 1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	May 1

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
11. Pressurizer Water Level--High	3	2	2	1	6#
12. A. Loss of Flow - Single Loop (Above P-8)	3/loop	2/loop in any operating loop	2/loop in each operating loop	1	6#
B. Loss of Flow - Two Loops (Above P-7 and below P-8)	3/loop	2/loop in two operating loops	2/loop each operating loop	1	6#
13. Steam Generator Water Level--Low-Low	3/loop	2/loop in any operating loops	2/loop in each operating loop	1, 2	6#
14. Steam/Feedwater Flow Mismatch and Low Steam Generator Water Level	2/loop-level and 2/loop-flow mismatch in each loop	1/loop-level coincident with 1/loop-flow mismatch in same loop	1/loop-level and 2/loop-flow mismatch in same loop or 2/loop-level and 1/loop-flow mismatch in same loop	1, 2	6#

TABLE 3.3-1 (Continued)

TABLE NOTATION

* With the reactor trip system breakers in the closed position and the control rod drive system capable of rod withdrawal.

\# The provisions of Specification 3.0.4 are not applicable.

\## Below the P-6 (Intermediate Range Neutron Flux Interlock) setpoint.

\### Below the P-10 (Low Setpoint Power Range Neutron Flux Interlock) Setpoint.

**** Values left blank pending NRC approval of 2 loop operation.

ACTION STATEMENTS

ACTION 1 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 72 hours.

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.1.1.

c. Either, THERMAL POWER is restricted to less than or equal to 75% of RATED THERMAL POWER and the Power Range Neutron Flux trip setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored at least once per 12 hours per Specification 4.2.4.2.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS (Continued)

ACTION 3 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below the P-6 (Intermediate Range Neutron Flux Interlock) setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.

b. Above the P-6 (Intermediate Range Neutron Flux Interlock) setpoint but below 10 percent of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 10 percent of RATED THERMAL POWER.

ACTION 4 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement suspend all operations involving positive reactivity changes.

ACTION 5 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter.

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 72 hours; and

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.1.1.

ACTION 7 - With less than the Minimum Number of Channels OPERABLE, within one hour determine by observation of the associated permissive annunciator window(s) that the interlock is in its required state for the existing plant condition, or apply Specification 3.0.3.

3/4.7.3 COMPONENT COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3 At least two independent component cooling water loops shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one component cooling water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.3 At least two component cooling water loops shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

VCS UNIT 1

		GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
R Abnormal Rad Levels / Rad Effluent	**1** Rad Effluent	Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE **RG1.1** 1 2 3 4 5 6 DEF Reading on **any** Table R-1 effluent radiation monitor > column "GE" for ≥ 15 min. (Notes 1, 2, 3, 4, 5) **RG1.2** 1 2 3 4 5 6 DEF Dose assessment using actual meteorology indicates doses > 1000 mrem TEDE or 5000 mrem thyroid CDE at or beyond the SITE BOUNDARY (Notes 3, 4, 5) **RG1.3** 1 2 3 4 5 6 DEF Field survey results indicate EITHER of the following at or beyond the SITE BOUNDARY: • Closed window dose rates > 1000 mR/hr expected to continue for ≥ 60 min. • Analyses of field survey samples indicate thyroid CDE > 5000 mrem for 60 min. of inhalation. (Notes 1, 2)	Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem thyroid CDE **RS1.1** 1 2 3 4 5 6 DEF Reading on **any** Table R-1 effluent radiation monitor > column "SAE" for ≥ 15 min. (Notes 1, 2, 3, 4, 5) **RS1.2** 1 2 3 4 5 6 DEF Dose assessment using actual meteorology indicates doses > 100 mrem TEDE or 500 mrem thyroid CDE at or beyond the SITE BOUNDARY (Notes 3, 4, 5) **RS1.3** 1 2 3 4 5 6 DEF Field survey results indicate EITHER of the following at or beyond the SITE BOUNDARY: • Closed window dose rates > 100 mR/hr expected to continue for ≥ 60 min. • Analyses of field survey samples indicate thyroid CDE > 500 mrem for 60 min. of inhalation. (Notes 1, 2)	Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE **RA1.1** 1 2 3 4 5 6 DEF Reading on **any** Table R-1 effluent radiation monitor > column "ALERT" for ≥ 15 min. (Notes 1, 2, 3, 4, 5) **RA1.2** 1 2 3 4 5 6 DEF Dose assessment using actual meteorology indicates doses > 10 mrem TEDE or 50 mrem thyroid CDE at or beyond the SITE BOUNDARY (Notes 3, 4, 5) **RA1.3** 1 2 3 4 5 6 DEF Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses > 10 mrem TEDE or 50 mrem thyroid CDE at or beyond the SITE BOUNDARY for 60 min. of exposure (Notes 1, 2) **RA1.4** 1 2 3 4 5 6 DEF Field survey results indicate EITHER of the following at or beyond the SITE BOUNDARY: • Closed window dose rates > 10 mR/hr expected to continue for ≥ 60 min. • Analyses of field survey samples indicate thyroid CDE > 50 mrem for 60 min. of inhalation. (Notes 1, 2)	Release of gaseous or liquid radioactivity greater than 2 times the ODCM limits for 60 minutes or longer **RU1.1** 1 2 3 4 5 6 DEF Reading on **any** Table R-1 effluent radiation monitor > column "UE" for ≥ 60 min. (Notes 1, 2, 3) **RU1.2** 1 2 3 4 5 6 DEF Sample analyses for a gaseous or liquid release indicates a concentration or release rate > 2 x ODCM limits for ≥ 60 min. (Notes 1, 2)
	2 Irradiated Fuel Event	Spent fuel pool level cannot be restored to at least the top of the fuel racks for 60 minutes or longer **RG2.1** 1 2 3 4 5 6 DEF Spent fuel pool level cannot be restored to at least Level 3 (ele. 437' 7") for ≥ 60 min. (Note 1)	Spent fuel pool level at the top of the fuel racks **RS2.1** 1 2 3 4 5 6 DEF Lowering of spent fuel pool level to Level 3 (ele. 437' 7")	Significant lowering of water level above, or damage to, irradiated fuel **RA2.1** 1 2 3 4 5 6 DEF Uncovery of irradiated fuel in the REFUELING PATHWAY **RA2.2** 1 2 3 4 5 6 DEF Damage to irradiated fuel resulting in a release of radioactivity as indicated by a Hi-Rad alarm on **any** of the following radiation monitors: • RM-G8 FHB Refueling Bridge Area Gamma • RM-A6 Fuel Handling Bldg Exhaust • RM-G6 Rx Bldg Refueling Bridge • RM-G17A/B Rx Bldg Manipulator Crane (when installed) **RA2.3** 1 2 3 4 5 6 DEF Lowering of spent fuel pool level to Level 2 (ele. 455' 6")	Unplanned loss of water level above irradiated fuel **RU2.1** 1 2 3 4 5 6 DEF UNPLANNED water level drop in the REFUELING PATHWAY as indicated by **any** of the following: • Refueling Cavity: LI-7403 MCB annunciator XCP-609 2-6 (REFUEL CAV LVL HI/LO) • Spent Fuel Pool: LI-7431 or LI-7433 MCB annunciators XCP 608(609)1-2 (SFP LVL HI/LO) • Fuel Transfer Canal: LI-7405 MCB annunciator XCP-612 1-6 (FUEL XFER CANAL LVL HI/LO) AND UNPLANNED rise in area radiation levels as indicated by **any** of the following radiation monitors: • RM-G6 Rx Bldg Refueling Bridge • RM-G17A/B Rx Bldg Manipulator Crane (when installed) • RM-G8 FHB Refueling Bridge Area Gamma
	3 Area Radiation Levels	None	None	Radiation levels that impede access to equipment necessary for normal plant operations, cooldown or shutdown **RA3.1** 1 2 3 4 5 6 DEF Dose rate > 15 mR/hr in EITHER of the following areas: • Control Room (RM-G1) • Central Alarm Station (by survey) **RA3.2** 1 2 3 4 5 6 DEF An UNPLANNED event results in radiation levels that prohibit or impede access to **any** Table R-2 area (Note 6)	None
E ISFSI	**1** Confinement Boundary	None	None	None	Damage to a loaded cask CONFINEMENT BOUNDARY **EU1.1** 1 2 3 4 5 6 DEF Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading greater than the following on the surface of the spent fuel cask (overpack): • 60 mrem/hr (γ + η) on the top of the overpack • 600 mrem/hr (γ + η) on the side of the overpack
H Hazards	**1** Security	HOSTILE ACTION resulting in loss of physical control of the facility **HG1.1** 1 2 3 4 5 6 DEF A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by the Security Team Leader AND EITHER of the following has occurred: **Any** of the following safety functions cannot be controlled or maintained • Reactivity control • Core cooling • RCS heat removal OR Damage to spent fuel has occurred or is IMMINENT	HOSTILE ACTION within the PROTECTED AREA **HS1.1** 1 2 3 4 5 6 DEF A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by the Security Team Leader	HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes **HA1.1** 1 2 3 4 5 6 DEF A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by the Security Team Leader OR A validated notification from NRC of an aircraft attack threat within 30 min. of the site	Confirmed SECURITY CONDITION or threat **HU1.1** 1 2 3 4 5 6 DEF A SECURITY CONDITION that does **not** involve a HOSTILE ACTION as reported by Security Team Leader OR Notification of a credible security threat directed at the site OR A validated notification from the NRC providing information of an aircraft threat
	2 Seismic Event	None	None	None	Seismic event greater than OBE levels **HU2.1** 1 2 3 4 5 6 DEF Seismic event > OBE as indicated by EITHER: • Triaxial Seismic Switch MCB annunciator XCP-638 4-5 (RB FOUND SEIS SWITCH OBE EXCEED) • **Any** red OBE light on the Triaxial Response Spectrum Recorder
	3 Natural or Tech. Hazard	None	None	None	Hazardous event **HU3.1** 1 2 3 4 5 6 DEF A tornado strike within the PROTECTED AREA **HU3.2** 1 2 3 4 5 6 DEF Internal room or area FLOODING of a magnitude sufficient to require manual or automatic electrical isolation of a SAFETY SYSTEM component needed for the current operating mode **HU3.3** 1 2 3 4 5 6 DEF Movement of personnel within the PROTECTED AREA is impeded due to an offsite event involving hazardous materials (e.g., an offsite chemical spill or toxic gas release) **HU3.4** 1 2 3 4 5 6 DEF A hazardous event that results in on-site conditions sufficient to prohibit the plant staff from accessing the site via personal vehicles (Note 9)
	4 Fire	None	None	Table H-1 Fire Areas • Reactor Building • Auxiliary Building • Control Building • Fuel Handling Building • Intermediate Building • Diesel Generator Building • Turbine Building • Service Water Pumphouse • Safe Shutdown Yard Areas: - RWST - CST - DG Fuel Oil Storage None	FIRE potentially degrading the level of safety of the plant **HU4.1** 1 2 3 4 5 6 DEF A FIRE is NOT extinguished within 15 min. of **any** of the following FIRE detection indications (Note 1): • Report from the field (i.e., visual observation) • Receipt of multiple (more than 1) fire alarms or indications • Field verification of a single fire alarm AND The FIRE is located within **any** Table H-1 area **HU4.2** 1 2 3 4 5 6 DEF Receipt of a single fire alarm (i.e., no other indications of a FIRE) AND The fire alarm is indicating a FIRE within **any** Table H-1 area AND The existence of a FIRE is not verified within 30 min. of alarm receipt (Note 1) **HU4.3** 1 2 3 4 5 6 DEF A FIRE within the plant PROTECTED AREA not extinguished within 60 min. of the initial report, alarm or indication (Note 1) **HU4.4** 1 2 3 4 5 6 DEF A FIRE within the plant PROTECTED AREA that requires firefighting support by an offsite fire response agency to extinguish
	5 Hazardous Gas	None	None	Gaseous release impeding access to equipment necessary for normal plant operations, cooldown or shutdown **HA5.1** 1 2 3 4 5 6 DEF Release of a toxic, corrosive, asphyxiant or flammable gas into any Table H-3 area AND Entry into the area is prohibited or impeded (Note 6)	Table H-3 Safe Operation & Shutdown Areas None
	6 Control Room Evacuation	None	Inability to control a key safety function from outside the Control Room **HS6.1** 1 2 3 4 5 6 DEF An event has resulted in plant control being transferred from the Control Room to the Control Room Evacuation Panels (CREP) AND Control of **any** of the following key safety functions is not reestablished within 15 min. (Note 1): • Reactivity control • Core cooling • RCS heat removal	Control Room evacuation resulting in transfer of plant control to alternate locations **HA6.1** 1 2 3 4 5 6 DEF An event has resulted in plant control being transferred from the Control Room to the Control Room Evacuation Panels (CREP)	None
	7 Judgment	Other conditions exist that in the judgment of the Emergency Director warrant declaration of General Emergency **HG7.1** 1 2 3 4 5 6 DEF Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.	Other conditions exist that in the judgment of the Emergency Director warrant declaration of Site Area Emergency **HS7.1** 1 2 3 4 5 6 DEF Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts, (1) toward site personnel or equipment that could lead to the likely failure of or, (2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the SITE BOUNDARY.	Other conditions exist that in the judgment of the Emergency Director warrant declaration of an Alert **HA7.1** 1 2 3 4 5 6 DEF Other conditions exist which, in the judgment of the Emergency Director, indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.	Other conditions exist that in the judgment of the Emergency Director warrant declaration of a UE **HU7.1** 1 2 3 4 5 6 DEF Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of SAFETY SYSTEMS occurs

Table R-1 Effluent Monitor Classification Thresholds

	Release Point	Monitor	GE	SAE	Alert	UE
Gaseous	Main Plant Vent Exhaust	RM-A3 (gas)	N/A	280,000 cpm	28,000 cpm	2 X Hi-Rad alarm
		RM-A13	14 mR/hr	N/A	N/A	N/A
	RB Purge Exhaust	RM-A4 (gas)	N/A	N/A	N/A	2 X HI-Rad alarm
		RM-A14	740 mR/hr	74 mR/hr	7.4 mR/hr	N/A
	Main Steam Line (Note 4)	RM-G19 A/B/C	535 mR/hr	53.5 mR/hr	5.4 mR/hr	N/A
Liquid	Liquid Waste and Nuclear Blowdown Discharge	RM-L9	N/A	N/A	N/A	2 X Hi-Rad alarm

Table R-2 Safe Operation & Shutdown Areas

Area	Mode Applicability
Auxiliary Building 374'	3
Auxiliary Building 388'	3, 4, 5
Auxiliary Building 400'	4, 5
Auxiliary Building 412'	3, 4, 5
Auxiliary Building 436'	1, 2, 3, 4, 5
Auxiliary Building 463'	3, 4, 5
Intermediate Building 412'	3
Intermediate Building 436'	4, 5
Intermediate Building 463'	3, 4, 5
Control Building 412'	2, 3
Control Building 436'	3, 4, 5
Turbine Building (All levels)	1, 2

Notes

Note 1: The Emergency Director should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit

Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is no longer VALID for classification purposes

Note 4: During a tube rupture with reactor at power RM-G19A/B/C monitor readings are affected by ^{16}N therefore they are not reliable until reactor has tripped and the monitors stable

Note 5: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available

Note 6: If the equipment in the listed room or area was already inoperable or out-of-service before the event occurred, then no emergency classification is warranted..

Note 7: If CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute time limit, declaration of a General Emergency is not required.

Note 8: A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does not include manually driving in control rods or implementation of boron injection strategies

Note 9: This EAL does not apply to routine traffic impediments such as fog, snow, ice, or vehicle breakdowns or accidents

Modes: 1 Power Operations | 2 Startup | 3 Hot Standby | 4 Hot Shutdown | 5 Cold Shutdown | 6 Refueling | DEF Defueled

Dominion Energy

VCS Unit 1

ALL CONDITIONS

VCS UNIT 1

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
S System Malfunct. — **1** Loss of ESF AC Power	Prolonged loss of all offsite and all onsite AC power to ESF buses **SG1.1** 1 2 3 4 Loss of **all** offsite and **all** onsite AC power capability to 7.2 KV ESF buses 1DA and 1DB (Table S-1) AND EITHER of the following: • Restoration of at least one ESF bus within 4 hours is **not** likely (Note 1) • CSFST Core Cooling-**RED** path conditions met	Loss of all offsite and all onsite AC power to ESF buses for 15 minutes or longer **SS1.1** 1 2 3 4 Loss of **all** offsite and **all** onsite AC power (Table S-1) capability to 7.2 KV ESF buses 1DA and 1DB for ≥ 15 min. (Note 1) **Table S-1 AC Power Supplies** Offsite: • 115 KV power to XTF-4 and XTF-5 • 230 KV power to XTF-31 • Parr Hydro Plant 13.8 KV power to ESF Bus 1DA or 1DB Onsite: • Diesel Generator A • Diesel Generator B	Loss of all but one AC power source to ESF buses for 15 minutes or longer **SA1.1** 1 2 3 4 AC power capability to 7.2 KV ESF buses 1DA and 1DB reduced to a single power source (Table S-1) for ≥ 15 min. (Note 1) AND **Any** additional single power source failure will result in loss of **all** AC power to SAFETY SYSTEMS	Loss of all offsite AC power capability to ESF buses for 15 minutes or longer **SU1.1** 1 2 3 4 Loss of **all** offsite AC power (Table S-1) capability to 7.2 KV ESF buses 1DA and 1DB for ≥ 15 min. (Note 1)
S System Malfunct. — **2** Loss of Vital DC Power	Loss of all AC and vital DC power sources for 15 minutes or longer **SG1.2** 1 2 3 4 Loss of **all** offsite and **all** onsite AC power (Table S-1) capability to 7.2 KV ESF buses 1DA and 1DB for ≥ 15 min. AND < 108 VDC on **both** Train A and Train B vital 125 VDC systems for ≥ 15 min. (Note 1)	Loss of all vital DC power for 15 minutes or longer **SS2.1** 1 2 3 4 < 108 VDC on **both** Train A and Train B vital 125 VDC systems for ≥ 15 min. (Note 1)	None	None
S System Malfunct. — **3** Loss of Control Room Indications	None	**Table S-2 Safety System Parameters** • Reactor power • Reactor vessel/pressurizer level • RCS pressure • Core Exit TCs • Level in at least one SG • EFW/AFW flow	UNPLANNED loss of Control Room indications for 15 minutes or longer with a significant transient in progress **SA3.1** 1 2 3 4 An UNPLANNED event results in the inability to monitor one or more Table S-2 parameters from within the Control Room for ≥ 15 min. (Note 1) AND **Any** of the following transient events in progress: • Automatic or manual runback greater than 25% thermal reactor power • Electrical load rejection greater than 25% full electrical load • Reactor trip • ECCS actuation	UNPLANNED loss of Control Room indications for 15 minutes or longer **SU3.1** 1 2 3 4 An UNPLANNED event results in the inability to monitor one or more Table S-2 parameters from within the Control Room for ≥ 15 min. (Note 1)
S System Malfunct. — **4** RCS Activity	None	None	None	Reactor coolant activity greater than Technical Specification allowable limits **SU4.1** 1 2 3 4 With letdown in service, RM-L1 high range monitor > 40,000 cpm **SU4.2** 1 2 3 Sample analysis indicates that a primary coolant activity value is > an allowable limit specified in Technical Specifications 3/4.4.8
S System Malfunct. — **5** RCS Leakage	None	None	None	RCS leakage for 15 minutes or longer **SU5.1** 1 2 3 4 RCS unidentified or pressure boundary leakage > 10 gpm for ≥ 15 min. OR RCS identified leakage > 25 gpm for ≥ 15 min. OR Leakage from the RCS to a location outside containment > 25 gpm for ≥ 15 min. (Note 1)
S System Malfunct. — **6** RTS Failure	None	Inability to shut down the reactor causing a challenge to core cooling or RCS heat removal **SS6.1** 1 An automatic or manual trip fails to shut down the reactor AND All manual actions to shut down the reactor are not successful in shutting down the reactor as indicated by reactor power ≥ 5% AND EITHER of the following conditions exist: • CSFST Core Cooling-**RED** path conditions met • CSFST Heat Sink-**RED** path conditions met	Automatic or manual trip fails to shut down the reactor and subsequent manual actions taken at the reactor control consoles are not successful in shutting down the reactor **SA6.1** 1 An automatic or manual trip fails to shut down the reactor AND Manual actions taken at the reactor control console are not successful in shutting down the reactor as indicated by reactor power ≥ 5% (Note 8)	Automatic or manual trip fails to shut down the reactor **SU6.1** 1 An automatic trip did **not** shut down the reactor after **any** RTS setpoint is exceeded AND A subsequent manual action taken at the reactor control consoles is successful in shutting down the reactor as indicated by reactor power < 5% (Note 8) **SU6.2** 1 A manual trip did not shutdown the reactor AND A subsequent automatic trip or manual trip action taken at the reactor control consoles is successful in shutting down the reactor as indicated by reactor power < 5% (Note 8)
S System Malfunct. — **7** Loss of Comm.	**Notes** **Note 1:** The Emergency Director should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded **Note 8:** A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does not include manually driving in control rods or implementation of boron injection strategies	None	**Table S-3 Communications Methods** System / Onsite / ORO / NRC • Plant Paging System — X • Radio System — X X • ORO Dedicated System — X X • Private Branch Exchange — X X X • Public Switched Telephone Network — X X X • Fiberoptic Network — X X X • Satellite Phone System — X X X • "Federal Telephone System" — X X	Loss of all onsite or offsite communications capabilities **SU7.1** 1 2 3 4 Loss of **all** Table S-3 onsite communication methods OR Loss of **all** Table S-3 ORO communication methods OR Loss of **all** Table S-3 NRC communication methods
S System Malfunct. — **8** CMT Isolation Failure	None	None	**Table S-4 Full Train Depressurization Equipment** RBCU Groups Operating / Containment Sprays Operating 2 / 0 1 / 1 0 / 2	Failure to isolate containment or loss of containment pressure control **SU8.1** 1 2 3 4 Containment isolation actuated AND **At least one** isolation valve in each penetration is **not** closed within 15 min. of the actuation (Note 1) **SU8.2** 1 2 3 4 Containment pressure > 12 psig **AND** < one full train of depressurization equipment (Table S-4) is operating per design for ≥ 15 min. (Note 1)
S System Malfunct. — **9** Hazard Event Affecting Safety System	None	**Table S-5 Hazardous Events** • Seismic event (earthquake) • Internal or external flooding event • High winds or tornado strike • FIRE • EXPLOSION • Other events with similar hazard characteristics as determined by the Shift Manager	Hazardous event affecting a SAFETY SYSTEM needed for the current operating mode. **SA9.1** 1 2 3 4 The occurrence of **any** Table S-5 hazardous event AND EITHER of the following: • Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM needed for the current operating mode. • The event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure needed for the current operating mode.	None
F Fission Product Barrier Degradation	**FG1.1** 1 2 3 4 Loss of **any** two barriers AND Loss or potential loss of third barrier (Table F-1)	**FS1.1** 1 2 3 4 Loss or potential loss of **any** two barriers (Table F-1)	**FA1.1** 1 2 3 4 **Any** loss or **any** potential loss of either Fuel Clad or RCS (Table F-1)	None

Table F-1 Fission Product Barrier Matrix

	Fuel Clad Barrier		Reactor Coolant System Barrier		Containment Barrier	
	Loss	Potential Loss	Loss	Potential Loss	Loss	Potential Loss
1. RCS or SG Tube Leakage	None	None	A. An automatic or manual ECCS (SI) actuation required by EITHER: • UNISOLABLE RCS leakage • SG tube RUPTURE	A. Operation of a standby charging pump is required by EITHER: • UNISOLABLE RCS leakage • SG tube RUPTURE B. CSFST RCS Integrity-**RED** path conditions met	A. A leaking or RUPTURED SG is FAULTED outside of containment	None
2. Inadequate Heat Removal	A. CSFST Core Cooling-**RED** path conditions met	A. CSFST Core Cooling-**ORANGE** path conditions met B. CSFST Heat Sink-**RED** path conditions met AND Heat sink required	None	A. CSFST Heat Sink-**RED** path conditions met AND Heat sink required	None	A. CSFST Core Cooling-**RED** path conditions met AND Restoration procedures **not** effective within 15 min. (Note1)
3. CMT Radiation / RCS Activity	A. RM-G7 or RM-G18 CNTMT HI RNG Gamma > 400 R/hr B. Dose equivalent I-131 coolant activity > 300 µCi/gm	None	A. RM-G7 or RM-G18 CNTMT HI RNG Gamma > 4 R/hr	None	None	A. RM-G7 or RM-G18 CNTMT HI RNG Gamma > 2,000 R/hr
4. CMT Integrity or Bypass	None	None	None **Table F-2 Full Train Depressurization Equipment** RBCU Groups Operating / Containment Sprays Operating 2 / 0 1 / 1 0 / 2		A. Containment isolation is required AND EITHER: • Containment integrity has been lost based on ED judgment • UNISOLABLE pathway from containment to the environment exists B. Indications of RCS leakage outside of containment	A. CSFST Containment-**RED** path conditions met B. Containment hydrogen concentration > 4% C. Containment pressure > 12 psig AND < one full train of depressurization equipment (Table F-2) is operating per design for ≥ 15 min. (Note 1)
5. ED Judgment	A. **Any** condition in the opinion of the ED that indicates loss of the fuel clad barrier	A. **Any** condition in the opinion of the ED that indicates potential loss of the Fuel Clad barrier	A. **Any** condition in the opinion of the ED that indicates loss of the RCS barrier	A. **Any** condition in the opinion of the ED that indicates potential loss of the RCS barrier	A. **Any** condition in the opinion of the ED that indicates loss of the Containment barrier	A. **Any** condition in the opinion of the ED that indicates potential loss of the Containment barrier

VCS UNIT 1

C — Cold SD/ Refueling System Malfunct.

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
1 RCS Level	Loss of reactor vessel/RCS inventory affecting fuel clad integrity with Containment challenged **CG1.1** [5][6] Reactor vessel level < 427' elevation (top of active fuel) for ≥ 30 min. (Note 1) AND **Any** of the following indications of containment challenge: • CONTAINMENT CLOSURE not established (Note 7) • Containment hydrogen concentration > 4% • UNPLANNED increase in Containment pressure **CG1.2** [5][6] Reactor vessel/RCS level cannot be monitored for ≥ 30 min. (Note 1) AND Core uncovery is indicated by **any** of the following: • RM-G6 Rx Bldg Refueling Bridge or RM-G17A/B Rx Bldg Manipulator Crane > 90,000 mR/hr (when installed) • Erratic source range monitor indication • UNPLANNED increase in **any** Table C-1 sump / tank level of sufficient magnitude to indicate core uncovery AND **Any** of the following indications of containment challenge: • CONTAINMENT CLOSURE not established (Note 7) • Containment hydrogen concentration > 4% • UNPLANNED increase in Containment pressure	Loss of reactor vessel/RCS inventory affecting core decay heat removal capability **CS1.1** [5][6] CONTAINMENT CLOSURE **not** established AND Reactor vessel level < 429' elevation (6" below the bottom of the hot leg penetration) **CS1.2** [5][6] CONTAINMENT CLOSURE established AND Reactor vessel level < 427' elevation (top of active fuel) **CS1.3** [5][6] Reactor vessel/RCS level cannot be monitored for ≥ 30 min. (Note 1) AND Core uncovery is indicated by **any** of the following: • RM-G6 Rx Bldg Refueling Bridge or RM-G17A/B Rx Bldg Manipulator Crane > 90,000 mR/hr (when installed) • Erratic source range monitor indication • UNPLANNED increase in **any** Table C-1 sump / tank level of sufficient magnitude to indicate core uncovery	Loss of reactor vessel/RCS inventory **CA1.1** [5][6] Loss of reactor vessel/RCS inventory as indicated by level < 429'-6" elevation (bottom of hot leg penetration) **CA1.2** [5][6] Reactor vessel/RCS level cannot be monitored for ≥ 15 min. (Note 1) AND UNPLANNED increase in **any** Table C-1 sump or tank levels due to a loss of reactor vessel/RCS inventory **Table C-1 Sumps/Tanks** • RB sump • CCW surge tank • PRT • RCDT	Unplanned loss of reactor vessel/RCS inventory for 15 minutes or longer **CU1.1** [5][6] UNPLANNED loss of reactor coolant results in reactor vessel/ RCS level less than a required lower limit for ≥ 15 min. (Note 1) **CU1.2** [5][6] Reactor vessel/RCS level cannot be monitored AND UNPLANNED increase in **any** Table C-1 sump or tank levels due to a loss of reactor vessel/RCS inventory
2 Loss of ESF AC Power	None	**Table C-2 AC Power Supplies** Offsite: • 115 KV power to XTF-4 and XTF-5 • 230 KV power to XTF-31 • Parr Hydro Plant 13.8 KV power to ESF Bus 1DA or 1DB Onsite: • Diesel Generator A • Diesel Generator B	Loss of **all** offsite and **all** onsite AC power to ESF buses for 15 minutes or longer **CA2.1** [5][6][DEF] Loss of **all** offsite and **all** onsite AC power (Table C-2) capability to 7.2 KV ESF buses 1DA and 1DB for ≥ 15 min. (Note 1)	Loss of all but one AC power source to ESF buses for 15 minutes or longer **CU2.1** [5][6][DEF] AC power capability to 7.2 KV ESF buses 1DA and 1DB reduced to a single power source (Table C-2) for ≥ 15 min. (Note 1) AND **Any** additional single power source failure will result in loss of **all** AC power to SAFETY SYSTEMS
3 RCS Temp.	None	**Table C-3 RCS Reheat Duration Thresholds** * If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced the EAL is **not** applicable RCS Status / Containment Closure Status / Heat-up Duration Intact AND **not** at REDUCED INVENTORY — N/A — 60 min. * **Not** intact OR at REDUCED INVENTORY — established — 20 min. * **not** established — 0 min.	Inability to maintain the plant in cold shutdown **CA3.1** [5][6] UNPLANNED increase in RCS temperature to > 200°F for > Table C-3 duration (Note 1) **CA3.2** [5][6] UNPLANNED RCS pressure increase > 10 psig (This EAL does not apply during water-solid plant conditions)	UNPLANNED increase in RCS temperature **CU3.1** [5][6] UNPLANNED increase in RCS temperature to > 200°F **CU3.2** [5][6] Loss of **all** RCS temperature and reactor vessel/RCS level indication for ≥ 15 min. (Note 1)
4 Loss of Vital DC Power	None	None	None	Loss of Vital DC power for 15 minutes or longer **CU4.1** [5][6] < 108 VDC on **required** DC buses for ≥ 15 min. (Note 1)
5 Loss of Comm.	None	None	None	Loss of **all** onsite or offsite communications capabilities **CU5.1** [5][6][DEF] Loss of **all** Table C-4 onsite communication methods OR Loss of **all** Table C-4 ORO communication methods OR Loss of **all** Table C-4 NRC communication methods
6 Hazardous Event Affecting Safety Systems	None	**Table C-5 Hazardous Events** • Seismic event (earthquake) • Internal or external flooding event • High winds or tornado strike • FIRE • EXPLOSION • Other events with similar hazard characteristics as determined by the Shift Manager	Hazardous event affecting a SAFETY SYSTEM needed for the current operating mode. **CA6.1** [5][6] The occurrence of **any** Table C-5 hazardous event AND EITHER of the following: • Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM needed for the current operating mode. • The event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure needed for the current operating mode.	None

Notes

Note 1: The Emergency Director should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded

Note 7: If CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute time limit, declaration of a General Emergency is not required.

Table C-4 Communications Methods

System	Onsite	ORO	NRC
• Plant Paging System	X		
• Radio System	X	X	
• ORO Dedicated System	X	X	
• Private Branch Exchange	X	X	X
• Public Switched Telephone Network	X	X	X
• Fiberoptic Network	X	X	X
• Satellite Phone System	X	X	X
• "Federal Telephone System"		X	X

Modes: [1] Power Operations [2] Startup [3] Hot Standby [4] Hot Shutdown [5] Cold Shutdown [6] Refueling [DEF] Defueled

Key (K) Verify (V) Rescore (R)

Name: Key	Date:
Teacher:	Class:
School:	Period:
Test Name: 2021 NRC Exam	

USE NO. 2 PENCIL ONLY • Example (A) ● (C) (D)

Student ID Number

Test ID

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