

Final Submittal

**CATAWBA APRIL 2003 EXAM
50-413 & 50-414/2003-301**

**MARCH 31 - APRIL 4 &
APRIL 30, 2003**

1. Reactor Operator Written Examination

*FINAL EXAM
WITH CHANGES*

**Nuclear Regulatory Commission
Reactor Operator Licensing
Examination**

Catawba Nuclear Station

AS ADMINISTERED

CHANGED QUESTION *20
ANNOTATIONS MADE

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Date: 4/18/2003	Facility/Unit: Catawba
Region: II	Reactor Type: W
Start Time:	Finish Time:

1 Pt(s) Unit 2 is performing a plant startup when a problem occurs in the main feedwater system.

The following events and conditions occur:

- 2A main feedwater pump is running
- 2B main feedwater pump turbine is not reset
- Reactor power is 25%
- The 2A main feedwater pump trips
- The operator manually trips the plant
- All steam generator levels decrease to 20%

Assuming systems operate as designed, when did the turbine driven CA pump receive an auto-start signal (if at all)?

- A. When the 2A main feedwater pump tripped.**
 - B. When narrow range level decreased below 36%.**
 - C. When the reactor trip occurred.**
 - D. The turbine driven CA pump did not receive an auto start signal.**
-

1 Pt(s)

Unit 1 was conducting a reactor startup following a refueling outage. Given the following conditions:

- N41 – N44 indicate 0%
- N-31 indicates 2.1×10^4 cps
- N-32 indicates 2.0×10^4 cps
- N-35 indicates 8.5×10^{-11} amps
- N-36 indicates 1.5×10^{-9} amps
- Rods are in manual with no rod motion
- SR and IR NIs are slowly increasing
- T_{ave} is holding steady

Which one of the following best explains the indications?

- A. N-35 compensating voltage is set too high**
 - B. N-35 compensating voltage is set too low**
 - C. N-36 compensating voltage is set too high**
 - D. N-36 compensating voltage is set too low**
-

1 Pt(s)

Unit 1 containment pressure is 4.0 psig. All equipment is operating as designed. Safety injection has been RESET.

Which one of the following action(s) is necessary for the operator to reopen IKC-425A (Reactor Building Non-Essential Supply Header Isolation)?

- A. **Press the OPEN pushbutton on MC-11.**
 - B. **Reset phase B and then press the OPEN pushbutton on MC-11.**
 - C. **Wait until containment pressure is less than 3 psig and then press the OPEN pushbutton on MC-11.**
 - D. **Wait until containment pressure is less than 0.3 psig and then press the OPEN pushbutton on MC-11.**
-

-
- 1 Pt(s) Unit 2 was operating at 100% power when an electrical fire started inside the auxiliary building cable room corridor. What type of fire suppression system is installed in this area and what are the hazards to personnel if they enter this room?
- A. A manual deluge (Mulsifyre) System is installed. An electrical shock hazard exists due to the use of water to combat an electrical fire.
 - B. An automatic sprinkler system is installed. An electrical shock hazard exists due to the use of water to combat an electrical fire.
 - C. An automatic Halon system is installed. An asphyxiation hazard exists due to the presence of Halon gas.
 - D. A manual Cardox system is installed. An asphyxiation hazard exists due to the presence of carbon dioxide gas.
-

1 Pt(s)

Unit 2 is responding to a loss of main feedwater event from 100% power.

Given the following events and conditions:

- e The reactor has tripped
- e The 2A and 2B motor-driven CA pumps started in auto
- e The turbine-driven CA pump (CAPT) started in auto
- e Train "A" CA has been reset
- e Train "B" CA has failed to reset
- e The CA pumps are aligned to the CACST

Which one of the following automatic system responses will occur as storage tank and CA pump suction pressures decrease?

- A. 2A CA pump trips.
CAPT #2 pump trips.
2B CA pump shifts to the RN system.
 - B. 2A CA pump suction shifts to the RN system.
CAPT #2 suction shifts to the RN system.
2B CA pump trips.
 - C. 2A CA pump suction shifts to the RN system.
CAPT #2 pump trips.
2B CA pump trips.
 - D. 2A CA pump trips.
CAPT #2 suction shifts to the RN system.
2B CA pump suction shifts to the RN system.
-

1 Pt(s)

Unit 1 is shutdown in mode 6 with fuel movement in progress. Given the following events and conditions:

- The new fuel elevator fails to operate in the up direction

Which one of the following statements describes the cause of this problem?

- A. **1EMF-15 (*SPENT FUEL BLDG REFUEL BRIDGE*) has failed high.**
- B. **1EMF-20 (*NEW FUEL STOR 1A*) has failed high.**
- C. **The load in the new fuel elevator weighs 1100 lbs.**
- D. **The spent fuel bridge crane is NOT indexed over the new fuel elevator.**
-

1 Pt(s)

Which one of the following statements correctly describes the **sequence** and **position** of VI system valves in response to a loss of VI header pressure?

- A. **VI-S00 (VI supply to VS) opens**
VS-78 (VS supply to VI) opens
 - B. **VI-S00 (VI supply to VS) opens**
VS-78 (VS supply to VI) closes
 - C. **VI-S00 (VI supply to VS) closes**
VS-78 (VS supply to VI) opens
 - D. **VI-S00 (VI supply to VS) closes**
VS-78 (VS supply to VI) closes
-

1 Pt(s) Unit 1 was responding to a steamline break inside containment on the 1C S/G per E-2 (*Faulted Steam Generator Isolation*). All equipment has operated as designed.

Which one of the following action statements correctly describes the expected method for isolating steam to the CAPT from the faulted S/G?

- A. **Manually close the CAPT #1 trip and throttle valve (1SA-145).**
 - B. **Manually close the 1C MSIV and MSIV bypass valve.**
 - C. **Manually close the maintenance isolation valve (1SA-4).**
 - D. **Select “OFF” on the CAPT #1 control switch.**
-

1 Pt(s)

Unit 2 was operating at 100% power when a design basis LOCA into containment occurred. Given the following conditions:

- 2EMF-53A/B (*Containment TRN A/B (HI Range)*) are both inoperable

Which one of the following indications would most accurately determine the dose rates inside containment for the offsite dose assessment calculations?

- A. 2EMF-38, 39, 40 (*Containment PAR/GAS/IOD*) indications
 - B. 2EMF-5 (*LIQ R/W CONTAREA*) indications
 - C. 2EMF-54(HH) (*Unit Vent Gamma (HI-HI Range)*) indications
 - D. **Portable instruments readings taken on the containment wall and appropriately scaled for shielding factors**
-

1 Pt(s)

A technician is performing a calibration procedure, which requires a series of approximately 10 sequential steps to be conducted while standing in a contaminated area. The communicator holds the procedure and reads each step sequentially by radio and the technician performs the step out of sight of the communicator.

If the performer does not have the procedure in hand as he/she performs the steps, what are the requirements of NSD 704 (*Technical Procedure Use and Adherence*) regarding the sign off for each step?

- A. Only the performer can sign off the steps upon completion of the task after leaving the contaminated area.
 - B. The communicator signs off each step as the step is completed using his/her own initials and the initials of the performer.
 - C. The communicator signs off each step as the step is completed using his/her own initials along with the time.
 - D. The communicator signs off each step as the step is completed using the performer's initials along with the time.
-

1 Pt(s)

A radiation worker is repairing a valve in a contaminated area, which has the following radiological characteristics:

- The worker's present exposure is 1943 mrem for the year
- General area dose rate = 30 mrem/hr
- Airborne contamination concentration = 10.0 DAC

The job will take 2 hours if the worker wears a full-face respirator. It will only take 1 hour if the worker does NOT wear the respirator.

If the RP Manager grants all applicable dose extensions, which one of the following choices for completing this job would maintain the worker's exposure within the station administrative requirements?

- A.** The worker should NOT wear the respirator because the calculated TEDE dose received will be less than if he wears one.
 - B.** The worker should NOT wear the respirator because the dose received without wearing a respirator will exceed site annual personnel dose limits.
 - C.** The worker should wear the respirator because the calculated TEDE dose received will be less than if he does not wear one.
 - D.** The worker should wear the respirator otherwise he could exceed DAC limits.
-

1 Pt(s)

Unit 2 is in mode 6 and refueling operations are currently in progress. Given the following events and conditions:

- The Fuel Handling Manipulator Crane Operator (FHMCO) has indexed the mast over the location where fuel assembly H-8 will be inserted.
- All conditions/indications on the fuel handling manipulator crane are satisfied for inserting the fuel assembly located at H-8, in accordance with procedure.

Which one of the following statements describes the responsibility of the "Operator at the Controls", associated with inserting the fuel assembly?

- A.** Receives notification of assembly insertion from the Fuel Handling SRO, and tracks core response to reactivity changes.
 - B.** Specifies the acceptable storage locations per Tech Specs and informs the Fuel Handling SRO.
 - C.** Grants permission to the FHMCO for inserting the fuel assembly from the control room via the engineer communicating with the refueling crew.
 - D.** Verifies proper $1/m$ plot results and gives permission to the FHMCO to unlatch the assembly.
-

1 Pt(s)

Unit 1 was operating at 100% with the pressurizer level controller in the 1-2 position. Given the following initial response:

- Charging flow reduces to minimum
- Backup heaters immediately energize
- Actual level begins to decrease

Which one of the following failures has occurred to cause this plant response?

- A. PZR level channel 1 detector reference leg has ruptured**
 - B. PZR level channel 1 detector variable leg has ruptured**
 - C. PZR level channel 2 detector reference leg has ruptured**
 - D. PZR level channel 2 detector variable leg has ruptured**
-

1 Pt(s) Unit 1 is responding to a station blackout. Given the following events and conditions:

- **A** fault occurred on the 1EMXE load center that supplied power to the 1A D/G battery charger. Repairs to this load center have not been made.
- RN was manually lined up to supply the DG KD system
- After two hours, the operators are ready to start the 1A diesel to restore power on 1ETA.

What effect will the loss of power on 1EMXE have on diesel generator 1A?

- A.** The diesel will start and run normally due to backup control power from **VADA**.
 - B.** The diesel will not start due to loss of control power.
 - C.** The diesel will start but the output breaker will not close due to loss of breaker control power.
 - D.** The diesel will start and the output breaker will close.
-

1 Pt(s)

Unit 1 was operating at 100% power when a loss of condenser vacuum occurred. Given the following events and conditions:

- The operators initiated AP/09 (*Rapid Downpower*)
- Reactor power dropped to 80%
- Turbine load dropped to 82% based on turbine impulse pressure
- The operator reports that condenser vacuum is 23.8 inches vacuum and is continuing to decrease slowly.

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

- A. **Manually trip the turbine then trip the reactor and enter E-0 (*Reactor Trip or Safety Injection*) immediately.**
- B. **Manually trip the reactor then trip the turbine and enter AP/2 (*Turbine Generator Trip*) immediately.**
- C. **If vacuum reaches 21.8 inches, manually trip the reactor and enter E-0.**
- D. **If vacuum reaches 21.8 inches, manually trip the turbine and enter AP/2.**
-

-
- 1Pt(s) If a large fire was reported in a vital area inside the RCA, which one of the following responses is correct by station procedures?
- A.** The Fire Brigade must suppress this fire without assistance because the Bethel Volunteer Fire Department is not allowed to access vital areas under the NRC's post-9/11 anti-terrorist orders.
 - B.** The Fire Brigade must suppress this fire because Bethel Volunteer Fire Department is not qualified to fight fire in a radiologically controlled area.
 - C.** The Fire Brigade is initially responsible for fire suppression activities at the scene. Upon arrival, the Bethel Volunteer Fire Department will take over control of the scene.
 - D.** The Fire Brigade is primarily responsible for fire suppression activities at the scene. The Bethel Volunteer Fire Department will respond promptly to the scene and will function under the Site Incident Commander.
-

1 Pt(s)

During an outage, air-operated valves 2NV-122B & 123B (*Loop C To Excess Ltdn HX Isol*) are being used to isolate valve 2NV 124B (*ExcessLtdn Press Cont*) for maintenance.

Which one of the following statements correctly describes the requirements for using 2NV-122/123 as an isolation boundary?

- A.** Tag shut the air supply to the valves and tag open the air regulator petcocks. Tags should also be firmly fixed around the remote operating switch on the main control board.
 - B.** Tag shut the air supply to the valves and tag closed the air regulator petcocks. Tags should also be firmly fixed around the remote operating switch on the main control board.
 - C.** Tag shut the air supply to the valves and tag closed the air regulator petcocks. A switch label should also be firmly fixed around the remote operating switch on the main Control board.
 - D.** Tag shut the air supply to the valves and tag open the air regulator petcocks. A switch labels should also be firmly fixed around the remote operating switch on the main control board.
-

1 Pt(s)

Unit 1 was operating at 100% power following a refueling shutdown. Unit 2 was shutdown in mode 6. It was discovered that a spent fuel element from the unit 1 refueling had been incorrectly stored in a filler location in the spent fuel pool. The element had exceeded the burnup (GWD/MTU) requirements to qualify for storage in a filler location.

Which one of the following statements describes the correct action(s) required by Tech Specs to preserve spent fuel pool shutdown margin?

- A. Immediately initiate action to move the non-complying fuel assembly to an unrestricted storage location.
 - B. Immediately initiate actions to move the non-complying fuel assembly to a restricted storage location and to shutdown Unit 1 within 1 hour.
 - C. Initiate action to move the non-complying fuel assembly to a restricted storage location within 1 hour.
 - D. Initiate actions to move the non-complying fuel assembly to an unrestricted storage location and to shutdown Unit 1 within 1 hour.
-

1 Pt(s)

Unit 1 was holding at 72% power during a load increase to 100% power when one group of control rods in bank D failed to move with the rest of the bank during a Xenon burnout transient. Given the following events and conditions:

- Rod control was in automatic
- Rod control urgent failure alarm had NOT actuated
- Bank D group counter is at 112 steps
- 2 rods in bank D are at 120 steps
- 3 rods in bank D are at 108 steps

Which one of the following statements correctly describes the operator actions prior to attempting rod realignment?

- A.** Place control rods in manual and do not move control rods. Hold rods at present position until realignment.
 - B.** Place control rods in manual and insert the 2 rods in bank D to 108 steps within one hour.
 - C.** Place control rods in manual and withdraw the 3 rods in bank D to 120 steps within one hour.
 - D.** Trip the reactor and enter E-0.
-

1 Pt(s)

Unit 2 was operating at 100% power when a terrorist attack in the control room caused the operators to rapidly evacuate to the Auxiliary Shutdown Panel. The operators were not able to perform AP/17 (Loss of Control Room) actions prior to evacuation at 0200.

The terrorists tripped the turbine but did not operate any other controls. There are no other local operator actions taken. Given the following steam generator narrow range levels:

	<u>0200</u>	<u>0202</u>	<u>0204</u>	<u>0206</u>	<u>0208</u>
2A S/G NR	65%	37%	22%	15%	25%
2B S/G NR	64%	38%	23%	18%	26%
2C S/G NR	63%	39%	25%	16%	24%
2D S/G NR	65%	38%	26%	20%	27%

Which one of the following statements describes the complete list of running feedwater pumps that can be monitored from the Auxiliary Shutdown Complex when the operators first arrive at the panels at 0210 to take local control of the plant?

- 4 MONITORED MEANS THAT THERE IS A DIRECT READOUT OF PUMP OPERATING PARAMETERS
- A. Both motor driven CA pumps
- B. Both motor driven CA pumps and the turbine driven CA pump
- C. Both motor driven CA pumps and both CF pumps (at minimum speed)
- D. Both motor driven CA pumps, the turbine driven CA pump and both CF pumps (at minimum speed)
-

1 Pt(s) Unit 2 is responding to a LOCA into the Auxiliary Building in ECA-1.2 (*LOCA Outside of Containment*). Upon completion of ECA-I.2, NC system pressure continues to decrease.

Which one of the following statements correctly describes the correct major action to assure proper method of removing decay heat under these conditions?

- A. **Transition back to E-1 (*Loss of Reactor or Secondary Coolant*).**
 - B. **Transition to ECA-1.1 (*Loss of Emergency Coolant Recirculation*).**
 - C. **Transition to ES-1.2 (*Post LOCA Cooldown and Depressurization*).**
 - D. **Transition to ES-1.3 (*Transition to Cold Leg Recirc*).**
-

1 Pts

Unit 2 is responding to a main steam line break inside containment. Given the following events and conditions:

- Containment pressure is 0.1 psig
- a The pressurizer is solid
- a ES-1.1 (*Safety Injection Termination*) has been implemented

Which one of the following statements correctly describes the status of the ECCS systems upon successful completion of ES-1.1?

- A. **One NS pump running to provide containment pressure control**
 - B. **One ND pump running to provide adequate heat removal**
 - C. **One NI pump running to provide adequate inventory control**
 - D. **One NV pump running to provide a normal charging lineup**
-

1 Pt(s)

Unit 2 is responding to a LOCA outside containment. The operators have reached step 22 of E-1 when the STA reports the following critical safety functions (CSFs) status indications on the OAC:

CSF	Status
1. NC INVENTORY	Yellow
2. CORE COOLING	Red
3. CONTAINMENT	Green
4. NC INTEGRITY	Green
5. HEAT SINK	Red
6. SUBCRITICALITY	Yellow

What is the correct order in which these CSFs shall be prioritized for response?

- A. 5, 2, 6, 4, 3, 1
 - B. 2, 5, 6, 1, 4, 3
 - C. 5, 2, 6, 1, 4, 3
 - D. 2, 5, 6, 4, 3, 1
-

1 Pt(s)

Why do some of the phase A containment isolation valves located in lower containment for the KC system have a separate manual reset on IMC7?

- A. The valves use air operators, which are not subject to spurious repositioning should they be submerged during containment flooding therefore they may be reset and repositioned if required by procedure.
 - B. The valves are all above the containment flooding level and are not subject to spurious repositioning during containment flooding therefore they may be reset and repositioned if required by procedure.
 - C. A separate reset is required because a containment phase A signal removes power from these valves causing them to fail closed to prevent them from spuriously repositioning due to containment flooding.
 - D. A separate reset is required because a containment phase A signal disables the open circuits for these valves to prevent them from spuriously repositioning due to containment flooding.
-

1 Pt(s)

Step 9.e of ECA-1.1 (Loss of Emergency Coolant Recirculation) requires operators to initiate NC system cooldown to cold shutdown:

"9.e Dump steam to condenser while maintaining cooldown rate based on NC T-colds as close as possible without exceeding 100 °F in an hour."

Which one of the following statements is in accordance with this step?

- A. Attention should be paid to maintaining the cooldown rate at 100°F/hr as an ideal value but not to be overly concerned if the exact value is not achieved. Any previous cooldown that had been conducted within the last hour needs to be considered.
 - B. Attention should be paid to maintaining the cooldown rate at 100°F/hr as an ideal value but not to be overly concerned if the exact value is not achieved. Any previous cooldown that had been conducted within the last hour does NOT need to be considered.
 - C. Considerable attention must be devoted to achieving and maintaining this cooldown rate - OMP 1-4 guidance on setpoints does not apply to this step. Any previous cooldown that had been conducted within the last hour needs to be considered.
 - D. Considerable attention must be devoted to achieving and maintaining this cooldown rate - OMP 1-4 guidance on setpoints does not apply to this step. Any previous cooldown that had been conducted within the last hour does NOT need to be considered.
-

1 Pt(s)

Unit 2 is operating at 75% power. Given the following events and conditions:

- 2CM-83 is in AUTO
- A load rejection occurs

Which one of the following statements correctly describes the response of 2CM-83, (Generator Load Rejection Bypass valve) during the load rejection?

- A. **2CM-83** opens to provide condensate flow around the hotwell pumps to assure minimum flow requirements.
- B. **2CM-83** opens to provide additional condensate pressure to the condensate booster pumps and bypass portions of the low pressure **CM** system.
- C. **2CM-83** closes to prevent a loss of water from the "C" heater drain tank to the condensate booster pump suction.
- D. **2CM-83** closes to prevent condensate water from being recirculated to the suction of the condensate booster pumps.
-

1 Pt(s)

Unit 2 is responding to a LOCA.

Given the following sequence of events and conditions:

- A reactor trip and safety injection occurred
- All NV, NI and ND pumps sequenced on properly
- ECCS was reset
- The 2ETA bus momentarily lost power but was reenergized by the 2A D/G

Which one of the following statements describes the correct restoration process for the train A NV, NI and ND pumps?

- A. 2A NV pump must be restarted by operator action
2A NI pump will automatically restart
2A ND pump will automatically restart
 - B. 2A NV pump will automatically restart
2A NI pump will automatically restart
2A ND pump will automatically restart
 - C. 2A NV pump will automatically restart
2A NI pump must be restarted by operator action
2A ND pump must be restarted by operator action
 - D. 2A NV pump must be restarted by operator action
2A NI pump automatically restart
2A ND pump must be restarted by operator action
-

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

Which one of the following statements correctly describes the priority and reasons for using the prescribed methods of depressurizing the NC system?

A.

1. Pressurizer spray - preferred method to be used if NC pump is running
2. Auxiliary Spray - alternate method - better control over depressurization rate
3. PORV - method of last resort - lack of control of depressurization rate - results in rupturing the PRT

B.

1. Pressurizer spray - preferred method to be used if NC pump is running
2. PORV - alternate method - better than auxiliary spray
3. Auxiliary Spray - method of last resort - too slow and may thermal shock the spray nozzles and degrade regenerative heat exchanger

C.

1. PORV - preferred method - rapid depressurization rate
2. Pressurizer spray - alternative method - next most rapid depressurization rate
3. Auxiliary spray - method of last resort - too slow and may thermal shock the spray nozzles

D.

1. Auxiliary spray - preferred method - does not degrade containment
 2. Pressurizer spray - alternative method - will not work if NC pump is not running
 3. PORV - method of last resort - will rupture PRT and degrade containment environment
-

1 Pt(s) Unit 1 is in mode 3. NC pressure is 1940psig. CA auto start defeat "Defeated" lights are lit

The following sequence of events occur on unit 1 while in mode 3:

1. CF isolation and the running CFPT trips on S/G Hi-Hi level
2. The S/G Hi-Hi level clears
3. CF isolation is reset
4. T-ave increases and NC pressure increases to 1960psig

Which of the following correctly explains when (if at all) any CA pump(s) should have automatically started?

- A. Following the CF isolation reset.**
 - B. When the S/G Hi-Hi level cleared.**
 - C. When pressure increased above P-11.**
 - D. The CA pumps have remained off for these events.**
-

1 Pt(s)

Unit 1 is at 4% power, conducting a plant startup. Given the following events and conditions:

- A control bank "A" rod drops
- NCS temperature decreases to 550°F

Which one of the following statements correctly describes the required actions (if any)?

- A.** No technical specification action is required, however, the plant must be shutdown to mode 3 to recover the rod.
 - B.** Within 30 minutes, adjust power range N/Is to increase reactor power so that reactor power and thermal power best estimate are equal.
 - C.** Within 30 minutes be in mode 2 with K_{eff} less than 1.0.
 - D.** Immediately trip the reactor and enter E-0 (Reactor Trip or Safety Injection).
-

1 Pt(s)

Unit 2 is responding to a LOCA. The crew has entered ES-I.2, Post LOCA Cooldown and Depressurization.

Given the following events and conditions:

- NCPs tripped
- Pressurizer level is steady
- Only one train of ECCS is injecting
- Loop A temperatures are representative of all 4 loops
- MSIVs and steam dumps are open

Which one of the following sets of plant parameters is indicative of fully established natural circulation as outlined in Enclosure 3, Natural Circulation Monitoring Parameters?

REFERENCES PROVIDED

	<u>Time</u>	0200	0205	0210	0215
A.	Steam Header Pressure (psig)	742	715	676	645
	NC System Pressure (psig)	968	964	960	958
	LOOP A T-hot (°F)	544	536	535	527
	LOOP A T-cold (°F)	512	510	502	497
B.	Steam Header Pressure (psig)	742	709	676	645
	NC System Pressure (psig)	968	972	975	981
	LOOP A T-hot (°F)	547	552	555	563
	LOOP A T-cold (°F)	548	544	540	536
C.	Steam Header Pressure (psig)	742	747	750	762
	NC System Pressure (psig)	968	964	960	958
	LOOP A T-hot (°F)	544	536	535	527
	LOOP A T-cold (°F)	512	514	515	517
D.	Steam Header Pressure (psig)	742	737	740	732
	NC System Pressure (psig)	938	942	945	941
	LOOP A T-hot (°F)	539	542	545	545
	LOOP A T-cold (°F)	513	510	510	506

1 Pt(s)

Unit 1 trips from 100% power due to an electrical fault.

- 5 minutes later, 1EMF-33 (Condenser Air Ejector Exhaust) alarms in **trip 2**.

Which one of the following indications will provide the best indication (most sensitive and timely) to confirm that a S/G tube leak has just occurred?

- A. **Observing 1EMF-26, 27, 28 and 29 (*Steamline 1A – 1D*)**
 - B. **Comparing S/G feed flow to steam flow mismatch**
 - C. **Observing 1EMF-34(L) (*S/G sample (lo range)*)**
 - D. **Observing 1EMF-71, 72, 73, 74 (*S/G A-D leakage*)**
-

1 Pt(s)

Federal Regulations require the emergency core cooling system to be designed to maintain peak cladding temperature below 2200 °F.

Which one of the following statements correctly describes the basis for this design criterion?

- A. To prevent acceleration of the zircalloy-water reaction.**
 - B. To prevent exceeding the zircalloy clad melting point.**
 - C. To prevent exceeding the fuel melting point.**
 - D. To prevent the onset of full film boiling and DNB.**
-

1 Pt(s)

Unit 2 is in the process of conducting a plant startup.

Power range channels indicate the following:

- PR N41 = 8%
- PR N42 = 8%
- PR N43 = 10%
- PR N44 = 8%

Assuming no operator action, which of the following conditions would result in an automatic reactor trip?

- A. All four RCPs trip.**
 - B. One turbine impulse pressure channel fails high.**
 - C. NCS controlling pressurizer level channel fails low.**
 - D. NCS controlling pressurizer pressure channel fails high.**
-

1 Pt(s) Units 1 and 2 are operating at 100% power with a normal service water line-up and RN pump 2A running. Given the following conditions and indications:

- RN pumps 1A, 1B and 2B start.
- 1 and 2 RN-48B (*RNSUPPLYX-OYERISOL*) close
- 1 and 2 RN-47A (*RNSUPPLYX-OYERISOL*) remain open
- RN suction and discharge valves swap to the SNSWP. ,

Which one of the following conditions correctly describes the cause of this condition?

- A. The Lake Wylie dam failed.**
 - B. RN pump intake pit “A” screens are clogged.**
 - C. RN pump intake pit “A” level indicator (*RNINTAKE PIT LVL “A”*) failed low.**
 - D. There was a spurious containment phase “B” actuation on Unit 1.**
-

1 Pt(s)

Unit 1 is recovering from a loss of secondary coolant accident. Safety injection initiated properly. A total loss of feedwater has caused the operators to implement FR-H.1, (*Loss of Secondary Heat Sink*). Given the following plant conditions:

- NCS Pressure 2335psig
- NCS Temperature 565°F
- S/G 1A, 1B, 1C Pressure 1180psig
- S/G 1A, 1B, 1C Level (WR) 12%
- S/G 1D Pressure 100psig
- S/G 1D Level (WR) 35%
- VI system pressure 10psig
- Containment pressure 3.4psig

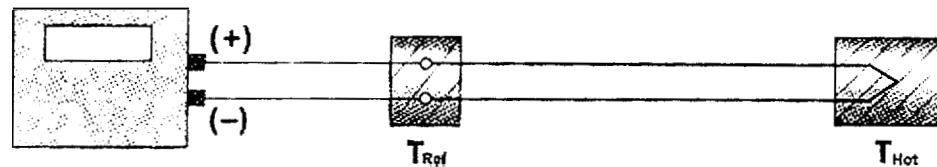
Which one of the following actions is initially required to assure the maintenance of adequate core cooling?

- A. **Depressurize S/G 1A, 1B, and 1C to allow feeding the S/G using the condensate system.**
- B. **Reset the CAPT and align it to feed S/G's 1A, 1B and 1C.**
- C. **Open 1NC-32B (PZR PORV) and 1NC-34A (PZR PORV) using nitrogen pressure.**
- D. **Reset safety injection and containment phase "A" isolation signals to re-establish instrument air pressure to open 1NC-32B and 1NC-34A.**

1 Pt(s)

Unit 2 is operating at 100% power with all rods out.

- **An** operator notices that one core exit thermocouple (T/C) for quadrant II on the plasma display was 620°F but suddenly spiked to 670°F.
- Other nearby T/Cs indicate a steady 620°F with no change in indicated temperature.
- The reference junction effective temperature is designed to be controlled at 165°F for all T/Cs.
- The following instrument diagram represents the T/C measuring circuit.



Which one of the following statements correctly describes the reason for this thermocouple to read much higher than the other thermocouples?

- A. The thermocouple measuring junction has been shorted.**
- B. The thermocouple measuring junction has an open circuit.**
- C. The thermocouple reference junction effective temperature has increased by 50°F.**
- D. The thermocouple reference junction effective temperature has decreased by 50°F.**

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

- 1 AD-6 F/10, (*PRT HI TEMP*) in alarm
- 1 AD-6 F/11 (*PRT HI PRESS*) in alarm
- Lower containment temperature = 124°F
- The NC system is at normal operating temperature
- Letdown is in service

Which one of the following statements correctly describes a condition that could cause these alarms?

- A. **The PRT has heated up due to ambient containment temperature.**
 - B. **1 ND-3 or 1ND-38, (*ND SUCTION RELIEF VALVEs*) have lifted.**
 - C. **1 NV-15B (*LETDN CUNTISOL*) has spuriously closed.**
 - D. **The reactor vessel inner O-ring has leaked.**
-

1 Pt(s)

Unit 1 was operating at 7% power when an electrical problem causes the loss of 1T1B. Given the following events and conditions in chronological sequence:

- Voltage on short buses 1TB and 1TD drops to 75%
- Frequency on short buses 1TB and 1TD decreases to 55 hertz.
- The 1TB-to-1TD fast bus transfer fails to occur
- All equipment operates as designed.
- No operator action

What is the current status of the unit?

- A. The reactor does not trip, B and D NCPs trip.**
 - B. The reactor does not trip, all NCPs trip.**
 - C. The reactor trips, B and D NCPs trip.**
 - D. The reactor trips, all NCPs trip.**
-

1Pt(s) Unit 1 was operating at 100% power when the crew detects indications of a loss of NC inventory. Given the following events and conditions:

- e All systems are in automatic
- e Indicated letdown flow is 62 gpm
- e 1NV-13A (*LTDNORIF 1A OTLT CONTISOL*) is open
- e Letdown pressure is 350 psig
- e Seal return – 3.5 gpm per NCP
- e Indicated charging flow – 90 gpm
- e Indicated seal injection flow – 35 gpm
- e VCT level is decreasing
- e Pressurizer pressure and level are constant
- e Containment humidity is increasing

Which one of the following statements correctly describes the location of the leak?

- A. **Letdown line, between the letdown orifice and the containment isolation valve.**
 - B. **Charging line between 1NV-309 (*Seal Water Injection Flow*) and 1NV-294 (*NV Pumps A&B Disch Flow CTRL*).**
 - C. **Charging line inside containment.**
 - D. **One of the RCS loops.**
-

1 Pt(s)

Unit 1 was operating at 100% when a design basis LOCA occurred. Radiation monitoring teams at the site boundary report that projected Iodine 131 dose is 25 rem.

Which one of the following statements correctly describes the cause of this problem on the VE filter trains?

- A. **The HEPA filters are saturated**
 - B. **The charcoal filters are saturated**
 - C. **The prefilter/demisters are saturated**
 - D. **The VE filter unit preheaters are energized**
-

1 Pt(s)

Unit 1 is operating at 75% power and Unit 2 is at 100% power. Given the following events and conditions:

- Switchyard breakers PCB 20 and 21 open.

Which one of the following statements correctly describes the effect on units 1 and 2?

- A. Unit 1 will remain at 75% power and unit 2 will runback to approximately 56%.**
- B. Unit 1 will runback to approximately 30% and unit 2 will remain at 100%.**
- C. Unit 1 will runback to approximately 56% and unit 2 will remain at 100%.**
- D. Both units 1 and 2 will runback to approximately 56%.**
-

1 Pt(s)

Unit 2 is operating at 100% power. Pressurizer level is on program, and normal charging is in service and letdown flow is through a 75 gpm orifice.

Given the following events and conditions:

- 2NV-3 14B (*CHARGINGLINE CUNT OUTSIDE ISOL*) spuriously closes due a relay failure
- Flashing in the letdown line reduces letdown flow to 5 gpm

Without operator action, approximately how long before a pressurizer level deviation alarm actuates?

Assume 135gallons = 1%pressurizer level

- A. A low-level deviation alarm will occur in less than one hour.**
 - B. A low-level deviation alarm will occur in greater than one hour.**
 - C. A high-level deviation alarm will occur in less than one hour.**
 - D. A high-level deviation alarm will occur in greater than one hour.**
-

1 Pt(s)

Unit 2 is at full power when the following events occur:

- Reactor power is approximately 98%
- NCS T_{ave} is increasing
- Main turbine load is 1150MWe
- Feedwater flow continues to operate as designed
- The RO is manually inserting rods

Which one of the following statements correctly describes the EOP basis in FR-S.1 (*Response to Nuclear Power Generation / ATWS*) for immediately tripping the turbine?

- A. Prevent an uncontrolled cooldown and positive reactivity addition.**
 - B. Maintain or extend steam generator inventory.**
 - C. Prevent turbine overspeed when the main generator trips.**
 - D. Minimize the peak pressure transient for the event.**
-

1 Pt(s) Unit 1 was operating at 100% power. Given the following trends on the 1A NCP:

Time	0200	0205	0210	0215
Motor bearing temp (°F)	180	184	186	195
Lower pump bearing temp (°F)	221	225	228	231
#1 seal outlet temp (°F)	205	227	235	251
Motor winding temp (°F)	312	314	316	323

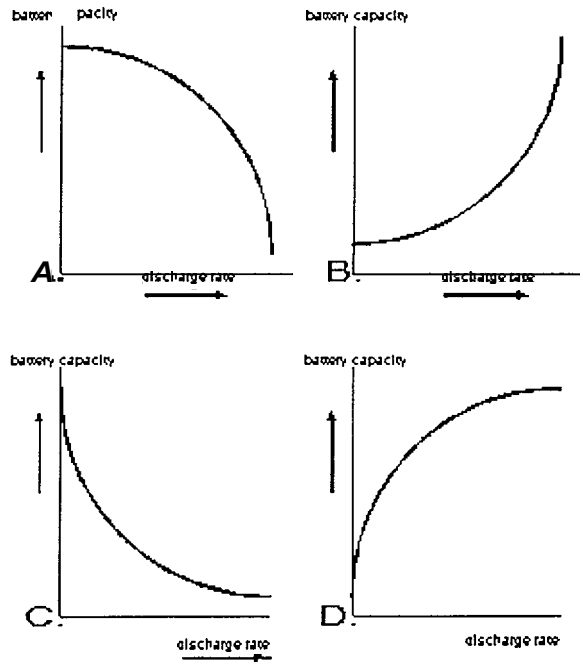
What is the earliest time at which the 1A NCP must be secured?

- A. 0200
 - B. 0205
 - C. 0210
 - D. 0215
-

1 Pt(s)

A station emergency battery is supplying DC bus loads without a battery charger on line.

If the equipment load on the DC bus does not change, which one of the following battery discharge curves describes the battery capacity as a function of the battery discharge rate?



1 Pt(s)

Unit 1 is responding to a S/G tube rupture in E-3 (*Steam Generator Tube Rupture*). Given the following events and conditions:

- The target temperature has been determined.
- P-11 has been reached and the operators have blocked main steam isolation signal.
- Operators are preparing to open the steam dumps to cooldown to the target temperature at step 19f of E-3.

What is the applicable limit for the operator opening the steam dumps?

- A. The steam dumps should be opened as far as possible to dump steam at a maximum rate while attempting to avoid a main steam isolation.
 - B. Steam dumps should be opened to limit the cooldown rate to less than 100 degrees/hour to prevent exceeding Tech Spec limits.
 - C. Steam dumps should be opened to limit the cooldown rate to less than **25** degrees/hour to prevent pressurized thermal shock concerns.
 - D. ***ALL*** steam dumps should be fully opened to depressurize the S/Gs as quickly as possible.
-

1 Pt(s)

Unit 1 was operating at 100% power when a loss of offsite power caused a reactor trip. The crew has verified natural circulation in ES-0.1 (*Reactor Trip Response*). Ten minutes later, the operator notes that the thermocouple input to both plasma displays is malfunctioning.

Which one of the following correctly describes a valid indication that natural circulation is continuing?

- A. **S/G saturation temperatures are decreasing and REACTOR VESSEL UR LEVEL indication is greater than 100 %.**
 - B. **S/G pressures are decreasing and T_{cold} is at S/G saturation temperature.**
 - C. **S/G pressures are decreasing and REACTOR VESSELD/P indication is greater than 100%.**
 - D. **S/G pressure is at saturation pressure for T_{cold} and REACTOR VESSELD/P indication is greater than 100 %.**
-

1 Pt(s)

Unit 1 is operating at full power. Given the following containment ventilation lineup:

- 3 Lower Containment Ventilation Units (LCVUs)
- 1 Pipe Tunnel Booster Fan (PTBF)
- 3 Control Rod Drive Mechanism (CRDM) Vent Fans
- 1 Incore Instrument Room Air Handling Units (IIRAHUs)
- 3 Upper Containment Ventilation Units (UCVUs)
- Both Containment Auxiliary Charcoal Filter Units (CACFUs) are shutdown

A loss of offsite power occurs on Unit 1. Both diesel generators start and energize ETA and ETB. Sequencing is complete. No operator action has been taken regarding the electric plant.

What is the expected Containment Ventilation lineup?

- A. **LCVUs, UCVUs and CRDM fans will be running; all other equipment will be shutdown.**
 - B. **LCVUs, UCVUs, CACFUs and CRDM fans will be running; all other equipment will be shutdown.**
 - C. **LCVUs, UCVUs, CACFUs, PTBFs and CRDM fans will be running; all other equipment will be shutdown.**
 - D. **LCVUs, UCVUs, PTBFs, IIRAHUs and CRDM fans will be running; all other equipment will be shutdown.**
-

1 Pt(s)

Which one of the following statements correctly describes how a severe axial flux imbalance that is outside of the normal limits (as defined in the ROD Book section 3.9 (*OAC Manual Input Data*)) could affect automatic and manual rod withdrawal at 100% power?

- A. AFD inputs to OTDT cause the OTDT setpoint to increase, which could actuate a **C3** rod stop to prevent automatic rod withdrawal. Operator would manually insert rods to restore AFD within the target band and clear the rod stop.
 - B. AFD inputs to OPDT cause the OPDT setpoint to decrease, which could actuate a **C3** rod stop to prevent automatic or manual rod withdrawal. Operator would manually insert rods to restore AFD within the target band and clear the rod stop.
 - C. AFD inputs to OPDT and OTDT cause both setpoints to decrease, which could actuate a **C3** or **C4** rod stop to prevent automatic or manual rod withdrawal. A turbine runback would automatically reduce NC temperature below the OPDT or OTDT setpoints to clear the rod stop.
 - D. AFD inputs to OPDT and OTDT cause both setpoints to increase, which would actuate a **C3** or **C4** rod stop to prevent automatic rod withdrawal. Manual rod withdrawal would still operate and a turbine runback would not occur. Operators would manually insert or withdraw rods to restore AFD within the target band and clear the rod stop.
-

1 Pt(s)

Unit 1 is operating at 100% power. Given the following events and conditions:

- Train “A” equipment is in service.
- 1ETA is deenergized due to a bus fault and power cannot be restored.
- All plant safety equipment operates automatically as designed.
- No operator action has been taken.

What would be the immediate impact (if any) of the loss of 1ETA on the NCPs?

- A. All NCPs would continue to be cooled.**
 - B. Only A and D NCPs would lose cooling.**
 - C. Only B and C NCPs would lose cooling.**
 - D. All NCPs would lose cooling.**
-

1 Pt(s)

Unit 2 was operating at 100% when a large-break LOCA occurred inside containment at 0200. Given the following events and conditions:

- 0201 – containment pressure = 1.0 psig
- 0205 – containment pressure = 3.0 psig
- 0210 – containment pressure = 0.5 psig
- 0215 – containment pressure = 0.1 psig

What should be the status of the Containment Air Return dampers and fans at time 0210?

- A. Dampers open; fans running.**
 - B. Dampers open; the fans never started.**
 - C. Dampers opened but have closed; fans started but have stopped.**
 - D. Dampers opened but have closed; the fans never started.**
-

1 Pt(s)

During a reactor start-up, the following conditions are noted:

- The reactor is at normal operating pressure and temperature.
- Four NCPs are running.
- NCS temperature is being controlled using the steam dumps.
- The reactor power is 5%.

Which of the following describes the change in actual plant parameters if the controlling steam header pressure transmitter fails high?

- A. Steam dump demand increases. Steam header pressure decreases, and NCS temperature decreases.**
 - B. Steam dump demand decreases. Steam header pressure increases, and NCS temperature increases.**
 - C. Steam dump demand increases, Steam header pressure increases, and NCS temperature decreases.**
 - D. Steam dump demand decreases. Steam header pressure decreases, and NCS temperature decreases.**
-

1 Pt(s)

A unit 1 containment purge is in progress using OP/1/A6450/015. Given the following events and conditions:

- 1EMF-39(L) (*Containment Gas (Lo Range)*) spiked to a trip 2 condition then cleared

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

- A. The **VP** release may not be reinitiated until **RP** draws a new containment air activity sample.
- B. The **VP** release may be reinitiated after the spike clears. If **1EMF-39** spikes a second time, the release cannot be reinitiated without **RP** sampling containment air for activity.
- C. The **VP** release may be reinitiated after the spike clears. If **1EMF-39** spikes a second time, the release may also be reinitiated.
- D. The **VP** release may be reinitiated if grab samples are taken of Unit vent activity during subsequent reinitiation.
-

1 Pt(s)

Unit 1 is at 75% power when a plant trip occurs due to P-14 actuation. Given the following events and conditions:

- The plant is currently stable.
- The steam dumps have just closed at no-load Tave.
- Steam generator levels are 35% in unaffected steam generators and 80% in the affected steam generator.

What action must the operator take to reset CF isolation?

- A. Cycle the reactor trip breakers only.**
 - B. Cycle the reactor trip breakers and depress the CF isolation reset pushbuttons.**
 - C. Lower the affected steam generator level and cycle the reactor trip breakers.**
 - D. Lower the affected steam generator level, cycle the reactor trip breakers and depress the CF isolation reset pushbuttons.**
-

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

- 1EMF-53A/B (*Containment TRN A/B (Hi Range)*) = 36 R/hr
- Containment pressure = 0.5 psig
- The operators enter FR-Z.3 (*Response to Containment **High** Radiation Level*)

Which one of the following statements correctly describes the proper (major action) response in FR-Z.3 to reduce airborne radiation levels inside containment?

- A. Place containment auxiliary charcoal filter units (CACFUs) in service.**
 - B. Place containment purge (VP) system in service.**
 - C. Place the containment spray (NS) system in operation.**
 - D. Place the containment air return fans (ARFs) in service.**
-

1 Pt(s)

Unit 1 was operating at 100% power when a loss of vital power occurs. Given the following events **and** conditions:

- 1AD-11, H/2 "125 VDC ESS PWR CHANNEL B TROUBLE" Alarm – is lit
- The operators dispatch an NLO to investigate the cause of the alarm
- The control room supervisor implements AP-29 (*Loss of Vital or Aux Control Power*).

Which one of the following actions shall be performed immediately?

- A. Close the breaker to 1EBB**
 - B. Open the tie breaker to 1EDB**
 - C. Verify ND - ALIGNED IN RHR MODE**
 - D. Verify TURB IMP PRESS CH 1 - NORMAL**
-

1 Pt(s) Unit 1 was operating at 100% power.

Which one of the following conditions requires a reactor trip and turbine trip?

- A. Exhaust hood temperature channel = 226 °F
 - B. Turbine bearing oil pressure = 13 psig
 - C. Condenser vacuum = 21.5 inches Hg Vacuum
 - D. Generator frequency = 65 Hz
-

1 Pt(s) Unit 1 is preparing to conduct a vacuum fill of the NC system at the end of a refueling outage. The NC system is in a mid loop condition.

Which one of the following reactor vessel level instruments will provide the greatest accuracy for this condition?

- A. **NC level loop indication**
 - B. **Sight glass loop indication**
 - C. **Ultrasonic level indication**
 - D. **RVLIS lower range indication**
-

1 Pt(s)

Unit 1 was shutdown in mode 6, in mid loop operations when a loss of ND cooling occurred. Given the following events and conditions:

- The operators implemented CASE IV of AP- 19 (*Loss of Residual Heat Removal System*) and have reached step 23.
- The **ND** system has been refilled and properly vented
- Step 23 requires restart of one **ND** pump to restore cooling.
- A caution warns the operator that restarting an **ND** pump can cause NC system level to decrease rapidly.

What is reason for this caution?

- A. NC system level will drop due to the contraction of the water from the cooldown.
 - B. NC system level will drop due to the suction of water from the NC system into the **ND** pump.
 - C. NC system level will drop due to the collapse of system voids.
 - D. NC system level will drop due to increased system pressure.
-

1 Pt(s) What sub-group of pressurizer heaters can be powered from SLXG?

- A. **Backup heater Group A**
 - B. **Backup heater Group B**
 - C. **Control Group C**
 - D. **Backup heater Group D**
-

1 Pt(s)

Unit 2 is at 100% power following a refueling. Given the following events and conditions:

- Reviews of surveillances reveals that all 3 channels on the flow instruments for NC loops 1C and ID were not calibrated properly and are out of specification.
- Repairs cannot be made for 12 hours due to parts availability.

What is the maximum power level allowed by Tech Specs at the time of repair?

REFERENCES PROVIDED:

- A. Reduce power to less than 69%**
 - B. Reduce power to less than 48%**
 - C. Reduce power to less than 10%**
 - D. Reduce power to mode 3**
-

1 Pt(s)

Unit 2 was operating at 100% power when a LOCA occurred.

Which one of the following statements correctly describes the operation of the NS/VX reset during the LOCA and what is the reason for this operation?

- A. **NSNX** is reset to allow the operator to take manual control of **NS** pumps.
 - B. **NSNX** is reset to terminate spray flow after pressure is reduced to prevent a vacuum in containment.
 - C. **NSNX** is **NOT** reset to prevent excessive cycling of **NS** spray pumps and **VX** fans.
 - D. **NSNX** is **NOT** reset to allow **NS** components to continue to operate when transferring to recirculation.
-

1 Pt(s)

Unit 2 is operating at 100% power. Given the following events and conditions:

- The plant operator reports the following annunciator is received on D/G panel 2A: "LOW VG AIR TANK PRESS"
- VG receivers starting air pressure is 149 psig.

Which one of the following statements correctly describes the 2A D/G?

- A. The D/G cannot be manually or automatically started until the VG receiver is repressurized.**
 - B. The D/G can be manually started and is capable of one or two starts.**
 - C. The D/G can be automatically started and is capable of one or two starts.**
 - D. The D/G can be automatically started and is capable of five starts.**
-

1 Pt(s)

Which one of the following statements explains the reason for E-0, *Reactor Trip or Safety Injection*, step 8. "Verify all Feedwater Isolation status lights (1 SI-5) - LIT."?

- A. **Prevent water from entering the steam lines due to uncontrolled CA flow.**
 - B. **Prevent water from entering the steam lines due to uncontrolled CF flow.**
 - C. **Prevent excessive NC system cooldown due to uncontrolled CA flow.**
 - D. **Prevent excessive NC system cooldown due to uncontrolled CF flow.**
-

-
- 1 Pt(s) Which one of the following statements correctly describes the analog and digital portions of the Engineered Safety Features Actuation System?
- A. There are 2 analog input channels.
 There are 3 to 4 digital output logic trains.**
 - B. There are 3 to 4 analog input channels.
 There are 2 digital output logic trains.**
 - C. There are 3 to 4 analog input channels.
 There are 4 digital output logic trains.**
 - D. There are 4 analog input channels.
 There are 4 digital output logic trains.**
-

1 Pt(s)

Unit 1 was operating at 50% power. Instrument air pressure is reading 80 psig in the control room.

Which one of the following actions should have just occurred?

- A. **Quick start of the standby air compressor**
 - B. **VI-670 'VI Dryer Auto Bypass' opened**
 - C. **CF control valves failed closed**
 - D. **VS-78 'VS supply to VI' opened**
-

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

- 3 control rod drive mechanism (CRDM) vent fans are running.
- CRDM vent fan 1D is out of service.
- Lower containment temperature is 105 F and steady.
- 1B pipe tunnel booster fan (PTBF) is running in LOW.
- Lower containment ventilation units (LCVUs) 1B, 1C and 1D are running in LOW speed and NORM cooling.
- C1A1081 (Reactor Vessel Head Area Temp) is 110 F
- C1A 1087 (Reactor Vessel Head Area Temp) is 110 F
- C1A1093 (Digital Rod Pos Ind Cabinet Area Temp) is 97 F.

If one of the running CRDM fans trips on over-current, what is the first action (if any) that needs to be taken by the crew?

REFERENCES PROVIDED:

- A. **Start a second PTBF.**
 - B. **Place all LCVUs to MAX cooling and shift LCVUs to high speed.**
 - C. **Place LCVU 1D and 1B only in MAX cooling and secure LCVU 1C.**
 - D. **Generate a work request to determine CRDM shroud leaving air temperature.**
-

-
- 1 Pt(s) When does the CPCS shutdown signal actuate and what is the purpose of this automatic protection?
- A. **CPCS actuates at 0.3 psig to prevent drawing a negative pressure in containment.**
 - B. **CPCS actuates at 0.3 psig to prevent NS pump runout caused by decreasing backpressure.**
 - C. **CPCS actuates at 0.5 psig to conserve FWST inventory.**
 - D. **CPCS actuates at 0.5 psig to reduce RN heat load.**
-

1 Pt(s) Unit 1 is operating at 100% power when a main steam line break occurs on the 1B steam generator. Given the following plant events and conditions:

- The operators have entered EP/1/A/5000/E-0 (*Reactor Trip or Safety Injection*)
- Maximum containment pressure was 1.5 psig
- 1A and 2A RN pumps are RUNNING
- 1RN36A (Rh' PUMP INJ FILT INLT X-OVER) OPEN
- 1RN37B (Rh' PUMP INJ FILT OTLT X-OVER) OPEN
- 1RN232A (D/G 1A HX INLET ISOL) OPEN
- 1RN292B (D/G 1B HX INLET ISOL) OPEN
- 1RN47A (RN SUPPLY X-OVER ISOL) CLOSED
- 1RN48B (RN SUPPLY X-OVER ISOL) CLOSED
- All other ECCS systems operate properly

Which one of the following actions is required to place the RN system in the correct configuration for the given conditions?

- A. **Close 1RN36A and open 1RN47A, 1B and 2B RN pumps are not operating.**
 - B. **Close 1RN37B and OPEN 1RN48B, 1B and 2B RN pumps are not operating.**
 - C. **Start 1B and 2B RN pumps, open 1RN47A & 1RN48B and close 1RN232A & 1RN292B.**
 - D. **Start 1B and 2B RN pumps, close 1RN36A & 1RN37B and open 1RN47A & 1RN48B.**
-

1 Pt(s) Unit 2 is operating at 100% power. Given the following events and conditions:

- Normal letdown alignment exists
- Controlling pressurizer pressure channel fails low.
- Operator immediately transfers control to an alternate operable channel.

Assuming no additional operator action, which one of the following statements correctly describes how letdown flow responds?

- A. **Letdown will isolate.**
 - B. **Letdown flow will indicate approximately 45 gpm.**
 - C. **Letdown flow will indicate approximately 75 gpm.**
 - D. **Letdown flow will indicate approximately 120 gpm**
-

1 Pt(s)

AP-21 (*Loss Of Component Cooling*) Foldout Page directs the operators to align alternate cooling to the 1A NV pump. Enclosure 4, Step 7 directs the operators to reduce motor cooler and oil cooler flow.

Why is YD flow to the 1A NV pump motor cooler and oil cooler flow reduced?

- A. **To preserve the YD storage tank inventory and to minimize chloride contamination of the KC system.**
 - B. **To maintain motor bearing temperature less than 160°F and stator temperature less than 240°F.**
 - C. **To minimize chloride contamination of the KC system *only*.**
 - D. **To reduce drainage to ND/NS sump, which minimizes radwaste.**
-

I Pts Unit 1 was operating at 100% power.

Which one of the following malfunctions could occur and still have KC train "A" remain operable?

REFERENCES PROVIDED:

- A. 1A2 KC pump has failed**
 - B. 1A KC surge tank has been drained**
 - C. 1A KC heat exchanger is being cleaned**
 - D. 1A ND heat exchanger KC side has a flow blockage**
-

1 Pt(s) Unit 2 is operating at 23% power. Given the following events and conditions:

- 120VAC panel 2ERPA fails

Which of the following statements is correct?

REFERENCES PROVIDED:

- A. **D/G 2A** cannot be run in manual and it will run in auto due to an emergency start signal.
- B. **D/G 2A** cannot be run in manual and it will not run in auto due to an emergency start signal.
- C. **D/G 2A** can be run in manual and it will not run in auto due to an emergency start signal.
- D. **D/G 2A** can be run in manual and it will run in auto due to an emergency start signal.
-

1 Pt(s)

IAE technicians are performing IP/O/B/3260/001 (*Maintenance and Troubleshooting Procedure for Making changes to 1.47 Bypass System*) at the local panel in the cable spreading room. They need the BOP to verify plant process information in the control room.

Which one of the following statements correctly describes how these communications should be conducted from the control room?

- A. Communication should be over hand-held radios. Three-way communication procedures are required.**
 - B. Communication should be over hand-held radios. Three-way communication procedures are NOT required.**
 - C. Communication should be over plant telephones. Three-way communication procedures are required.**
 - D. Communication should be over plant telephones. Three-way communication procedures are NOT required.**
-