

Question: 1

Given the following:

- A Reactor Trip occurs on Unit 1 from 100% power.
- 1-ES-0.1, Reactor Trip response, has been implemented.
- Control Bank D Rod H14 IRPI indicates 218 steps.
- All other control rods indicate 0 steps.
- T_{AVG} is 547 °F and stable.

Which ONE of the following completes the statements below?

- 1) One minute after the trip, shutdown margin is rising due to the decay of __ (1) __.
- 2) In accordance with 1-ES-0.1, Reactor Trip Response, Emergency Boration __ (2) __ required.

- A. 1) Iodine 2) is NOT
- B. 1) Iodine 2) is
- C. 1) Xenon 2) is
- D. 1) Xenon 2) Is NOT

Question: 2

Given the following:

- A SBLOCA has occurred.
- The team is in 1-ES-1.2, Post-LOCA Cooldown and Depressurization.
- An RCS cooldown has been initiated by dumping steam.
- All RCPs are running.
- Pressurizer level is 40% and rising slowly.
- Subcooling is 50°F and rising.

The Operator has just been directed to stop RCPs not required for normal Pressurizer spray.

In accordance with 1-ES-1.2 which ONE of the following describes:

- 1) The optimum RCP configuration required for normal Pressurizer spray.
- 2) The reason for securing RCPs.

- A.
 - 1) 1-RC-P-1C
 - 2) Minimize inventory loss from the RCS.
- B.
 - 1) 1-RC-P-1A or 1-RC-P-1B.
 - 2) Minimize heat input to the RCS
- C.
 - 1) 1-RC-P-1C.
 - 2) Minimize heat input to the RCS
- D.
 - 1) 1-RC-P-1A or 1-RC-P-1B.
 - 2) Minimize inventory loss from the RCS.

Question: 3

During a Large Break LOCA, the operator notes the following trends (from time 1 to time 6) of ICCM Train 'A' Subcooling margin monitor, and Core Exit Thermocouple indication (Train B shows similar values):

Time (after start of LBLOCA)	Subcooling	CETC
Time 1 (30 sec)	0 °F	546 °F
Time 2 (1 min)	-3 °F	538 °F
Time 3 (2 min)	-33 °F	372 °F
Time 4 (3 min)	-35 °F	360 °F
Time 5 (4 min)	-35 °F	332 °F
Time 6 (5 min)	-35 °F	284 °F

Which ONE of the following completes the statements:

- 1) Subcooling margin indications are based on the average of the _____.
 - 2) What is the significance of the subcooling margin monitor indications for Times 4, 5, and 6?
- A.
 - 1) 5 highest CETs
 - 2) Subcooling margin monitor is at the bottom of its scale.
 - B.
 - 1) 5 highest CETs
 - 2) Unit conditions have stabilized.
 - C.
 - 1) 25 compensated CETs
 - 2) Subcooling margin monitor is at the bottom of its scale.
 - D.
 - 1) 25 compensated CETs
 - 2) Unit conditions have stabilized.

Question: 4

Given the following:

- Unit 1 reactor is operating at 30% power.
- 1-RC-P-1A, "A" RCP, trips on ground overcurrent.

Which ONE of the following statements describes how the plant will respond and the reason a reactor trip is necessary?

- A. The reactor will immediately trip to avoid challenging DNB limits.
- B. The Reactor will NOT immediately trip. It should be tripped to avoid challenging DNB limits.
- C. The reactor will immediately trip to avoid challenging kW/ft limits.
- D. The reactor will NOT immediately trip. It should be tripped to avoid challenging kW/ft limits.

Question: 5

Initial Conditions:

- The RCS is solid.
- RCS pressure is 300 psig.
- RCS temperature of 150°F.
- Cooldown in progress.
- "A" RHR pump and the "A" RHR heat exchanger are in service.
- 2-RC-P-1C, "C" RCP, running.
- 2-CH-PCV-2145 is controlling pressure with 2-CH-FCV-2122, Charging Flow CNTRL, in Manual.

Current Conditions:

- "A" RHR pump trips

Based on the above conditions, which ONE of the following describes:

- 1) Initial response of RCS pressure?
 - 2) What adjustment to 2-CH-PCV-2145, LTDR LINE PRESS CNTRL, controller demand will maintain RCS pressure at 300 psig?
- A. 1) Lowers.
2) Raise.
- B. 1) Rises.
2) Lower.
- C. 1) Lowers.
2) Lower.
- D. 1) Rises.
2) Raise.

Question: 6

Initial Conditions:

- A normal plant cooldown is in progress on Unit 1. The Unit is not yet on RHR.
- CC Surge tank level indication is 60% and stable.
- SFP level is 23.5" and stable.

Current Conditions:

- Annunciator RM-Q5, CC/SW HX B ALERT/FAILURE.
- 1-SW-RI-107B, CC/SW HX B, indicates "EEEEEE".
- Annunciator VSP-D4, SPENT FUEL PIT HI LEVEL has been received.
- CC Surge tank level indication is 36% and lowering.
- Makeup to the CC surge tank is in progress.

Which ONE of the following identifies:

- 1) The source of the leak?
 - 2) The source of water for maintaining CC System inventory?
-
- | | |
|--------------------------------------|-----------------------|
| A. 1) Spent Fuel Pit Heat Exchanger. | 2) PG water. |
| B. 1) Spent Fuel Pit Heat Exchanger. | 2) Condensate System. |
| C. 1) 1B CC Heat Exchanger | 2) PG Water. |
| D. 1) 1B CC Heat Exchanger | 2) Condensate System. |

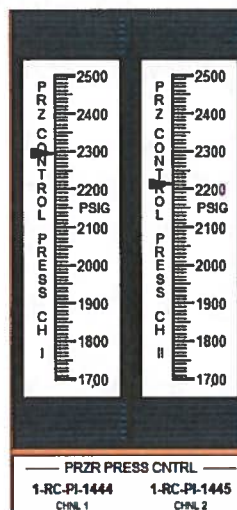
Question: 7

Unit 1 is at 100% power.

- A Failure occurs in the Pressurizer pressure control system.
- All Pressurizer pressure controllers are in AUTO.
- The RO observes the Pressurizer pressure control channels responding as shown:
 - 1-RC-PI-1444 is rising.
 - 1-RC-PI-1445 is lowering.

If these trends continue, which one of the following describes the response of the Przr Pressure Control System?

- A. Both PRZR spray valves are currently open and 1-RC-PCV-1456 will OPEN.
- B. Both PRZR spray valves are currently open and 1-RC-PCV-1455C will OPEN.
- C. Only the Proportional Heaters turn FULL ON, both PRZR spray valves CLOSE.
- D. ALL Heaters turn ON, both PRZR spray valves CLOSE.



Question: 8

The Crew is responding to a SGTR in accordance with 1-E-3, Steam Generator Tube Rupture.

- The Rapid RCS cooldown has been completed.

Which ONE of the following describes:

- 1) The subcooling value for RCS depressurization termination.
- 2) The purpose for the RCS depressurization.

- A.
 - 1) 50 °F.
 - 2) Minimize break flow and refill the pressurizer.
- B.
 - 1) 50 °F.
 - 2) Minimize Reactor Vessel stress for PTS concerns.
- C.
 - 1) 30 °F.
 - 2) Minimize break flow and refill the pressurizer.
- D.
 - 1) 30 °F.
 - 2) Minimize Reactor Vessel stress for PTS concerns.

Question: 9

The Crew is restoring offsite power to Unit 1 in accordance with 0-AP-10.08, Station Power Restoration.

Which ONE of the following completes the statements?

- 1) Breaker 15D1, Transfer Bus "D" Supply breaker control switch is located on the __ (1) ____.
 - 2) At a minimum, the control switch for 15F1 must held in "close" for __ (2) ____ seconds.
-
- A. 1) Bench Board 1-2
2) 15
 - B. 1) Bench Board 1-2
2) 5
 - C. 1) Liquid Waste Panel
2) 15
 - D. 1) Liquid Waste Panel.
2) 5

Question: 10

Given the following:

- Unit 2 initially operating at 100% when a loss of offsite power occurred.
- The Crew is currently in 2-ES-0.2, Natural Circulation Cooldown.

Which ONE of the following completes the statements below:

- 1) ___(1)___ CRDM fans should be running.
- 2) The maximum cooldown rate of the RCS is limited to ___(2)___ in the reactor vessel head.

- A. 1) 2
2) allow for potential void formation
- B. 1) 3
2) preclude void formation
- C. 1) 2
2) preclude void formation
- D. 1) 3
2) allow for potential void formation

Question: 11

Given the following:

- Unit 1 is operating at 100%.
- Annunciator 1K-A8, UPS System 1A Trouble, is received.
- Local report finds the following AMBER lights lit on UPS 1A1:
 - Inverter output voltage low.
 - Alternate source voltage low.
 - Inverter to static switch fuse F204.
 - Alternate source to Static Switch fuse F205.

Which ONE of the following describes the status of Vital Bus I and IA?

<u>Vital Bus I</u>	<u>Vital Bus IA</u>
A. De-energized	De-energized
B. De-energized	Energized
C. Energized	De-energized
D. Energized	Energized

Question: 12

Given the following conditions on Unit 1:

- Actions of 1-ECA-0.0, Loss of All AC Power, are being performed.
- Battery 1A and 1B voltages are 118 VDC and slowly lowering.

Which one of the following completes the statements below?

- 1) In accordance with 1-ECA-0.0, when station batteries reach a minimum voltage of __ (1) __ VDC, the voltage will begin to lower exponentially.
- 2) 4 KV Switchgear breakers without DC control power __ (2) __ trip automatically if a Fault condition occurs.

- A. 1) 110 2) will
- B. 1) 110 2) will not
- C. 1) 105 2) will
- D. 1) 105 2) will not

Question: 13

Initial Condition

- Unit 1 is operating at 100% power.
- Unit 2 is in RSD with core off-load to the SFP complete 10 hours ago.

Current Condition

- A tagging error results in isolation of SW flow to all CC HXs.
- CC surge tank level is 55% and rising.
- CC HX Disch Temp is 76°F and rising.

Which ONE of the following describes:

- 1) CC Surge Tank High Level alarm setpoint is ____ (1) ____.
- 2) The CC Surge Tank Vent Valve ____ (2) ____ automatically close on high level.

A. 1) 93%
2) will not

B. 1) 93%
2) will

C. 1) 70%
2) will not

D. 1) 70%
2) will

Question: 14

Given the following:

- A major grid disturbance results in the loss of off-site power and the trip of both Units.
- Due to multiple failures, the Unit 1 Crew has entered 1-ECA-0.0, Loss of All AC Power.

Which ONE of the following completes the statement below:

The Temporary Diesel Driven Air Compressor ____ (1) ____ require local action to align its discharge to the Instrument Air System, and local action ____ (2) ____ be required to align Station Instrument Air to the Containment Instrument Air System.

- A. 1) will
2) will
- B. 1) will
2) will NOT
- C. 1) will NOT
2) will
- D. 1) will NOT
2) will NOT

Question: 15

Initial Conditions:

- Unit 1 and Unit 2 are operating at 100%.
- The plant has been notified by SOC that there are significant grid instabilities due to numerous base load plants being out of service.
- The SOC has requested maximum power generation from both units.

Current Conditions:

- The SOC reports that the 500 KV system is most impacted and the Emergency Low Limit for that network has been reached.
- The BOP reports the following Unit 1 changes (Note: Unit 2 parameters are comparable):

	GEN MWe	GEN MVARs	Grid Freq	Gen Amps	Gen Volts	Gen H2 Press
Initial	907	+ 10	60 Hz	23,500	22.3 KV	75 psig
Current	1020	- 210	58.0 Hz	27,500	21.6 KV	75 psig

Which ONE of the following completes the statements below?

- 1) Based on the information given the Reactor __ (1) __ required to be tripped.
- 2) Which Emergency buses are most affected by the current conditions stated above?

(REFERENCE PROVIDED)

- 1) is
2) Buses 1J and 2H.
- 1) is not
2) Buses 1J and 2H.
- 1) is not
2) Buses 1H and 2J.
- 1) is
2) Buses 1H and 2J.

Question: 16

Given the following:

- An automatic Reactor Trip and Safety Injection occurred from 100% power.
- Operators have just transitioned to 1-ECA-1.2, "LOCA OUTSIDE CONTAINMENT."

Which ONE of the following parameters is used to determine if the break has been isolated, in accordance with 1-ECA-1.2?

- A. RVLIS level.
- B. RCS subcooling.
- C. PRZR level.
- D. RCS pressure.

Question: 17

Given the following:

0900 – Earthquake felt at Surry Power Station.

0905 – Auto Reactor trip (both units) and Loss of offsite power.

0910 – Unit 1 Auto Safety Injection occurs and following conditions noted:

RCS pressure is 1505 psig and lowering.

Containment pressure is 13.2 psia and rising.

RO reports that the 'B' LHSI pump, 1-SI-P-1B has tripped on overcurrent.

0920 – The crew has entered 1-E-1, Loss of Reactor or Secondary Coolant.

0925 – The 'A' LHSI pump trips on overcurrent.

0945 – Current time.

Per 1-ECA-1.1, Loss of Emergency Coolant Recirculation, which ONE of the following identifies the minimum SI flow rate needed for decay heat removal?

(REFERENCE PROVIDED)

- A. 280 gpm
- B. 310 gpm
- C. 330 gpm
- D. 380 gpm

Question: 18

Initial Conditions:

- Unit 1 reactor operating at 100% power.
- The reactor is tripped and safety injection actuated.
- A steam leak is reported in Unit 1 Safeguards.

Current Conditions:

- The Crew has entered ECA-2.1, Uncontrolled Depressurization of All Steam Generators.
- All SG NR levels are off-scale low.
- RCS Cooldown rate is 155°F/hour.

Which ONE of the following states:

- 1) What is the MINIMUM AFW flow (gpm) to each SG?
 - 2) Will a transition to 1-FR-H.1 be required after AFW has been throttled?
- A. 1) 60
2) No
- B. 1) 100
2) No
- C. 1) 60
2) Yes
- D. 1) 100
2) Yes

Question: 19

Initial Conditions:

- Reactor Power is 85% with a ramp to 100% in progress.
- Rod control is in Auto.

Current Conditions:

- A 100 gallon Alt. Dilute is in progress.
- Control Bank D rods begin withdrawing at 8 steps per minute.

Which ONE of the following states the action taken by the RO in accordance with the Abnormal Procedures?

- A. Trip the reactor.
- B. Place rod control in manual.
- C. Stop the dilution.
- D. Stop the ramp.

Question: 20

Unit 1 is operating at 100%, AND 1-AP-16.00, Excessive RCS Leakage, is in progress:

- The following Annunciators are LIT.
 - 1A-A3, N-16 HIGH.
 - 1A-B3, N-16 ALERT
- Letdown has been isolated.
- Charging flow is 45 gpm and stable.
- Pressurizer level is 53% and stable.

Which of the following completes the statements below concerning the tube leak on 'A' SG?

In accordance with 1-AP-16.00, Excessive RCS Leakage, a reactor trip __ (1) __ required. The Appropriate AOP entry is __ (2) __.

- A. 1) is 2) 1-AP-24.01, Large SG Tube Leak
- B. 1) is not 2) 1-AP-24.00, Minor SG Tube Leak
- C. 1) is 2) 1-AP-24.00, Minor SG Tube Leak
- D. 1) is not 2) 1-AP-24.01, Large SG Tube Leak

Question: 21

Given the following:

- Fuel movement is in progress in the Fuel Building.
- Fuel Handlers report an assembly has been dropped and appears to be damaged.
- 1-RM-RI-153, FUEL PIT BRIDGE, HIGH Alarm is received.
- The Crew has initiated 0-AP-22.00, Fuel Handling Abnormal Conditions.

Which ONE of the following identifies:

- 1) The MCR must be ISOLATED within ____ (1) ____ minutes.
- 2) The release is monitored using ____ (2) ____.

- A. 1) 2
2) 1-VG-RI-104, Vent Vent 1 Gas
- B. 1) 2
2) 1-VG-RI-131 A/B/C, Vent #2 Gas/Particulate
- C. 1) 60
2) 1-VG-RI-104, Vent Vent 1 Gas
- D. 1) 60
2) 1-VG-RI-131 A/B/C, Vent #2 Gas/Particulate

Question: 22

Given the following:

- MCR Evacuation is in progress IAW 0-FCA-1.00, LIMITING MCR FIRE, due to a fire in the MCR.
- All Control room actions have been completed on both units.
- Operators have been dispatched to perform 0-FCA-11.00, Remote Monitoring.

Which ONE of the following completes the statement below:

Charging Line flow is monitored at the __ (1) __, and Neutron flux is monitored at the __ (2) __.

- A. 1) Auxiliary Shutdown Panel 2) Auxiliary Shutdown Panel
- B. 1) Remote Monitoring Panel 2) Remote Monitoring Panel
- C. 1) Auxiliary Shutdown Panel 2) Remote Monitoring Panel
- D. 1) Remote Monitoring Panel 2) Auxiliary Shutdown Panel

Question: 23

Unit conditions are as follows:

- RCS pressure 650 psig.
- Containment pressure is 38 psia and slowly lowering.
- RCPs have been secured.
- RVLIS Full Range level is 44% and lowering slowly.
- CETC Temperature is 745°F and rising slowly.
- The Crew has entered FR-C.1, Response to Inadequate Core Cooling.
- The Crew has reached Step 14, DEPRESSURIZE ALL INTACT SGs TO 200 PSIG.

Which ONE of the following identifies:

- 1) The component(s) used to depressurize the Intact SGs.
 - 2) The purpose for the depressurization.
-
- A. 1) Steam Dumps.
2) Reduce secondary to primary D/P across the SG tubesheet.
 - B. 1) Steam Dumps.
2) Reduce RCS pressure to allow SI Accumulator and LSI pump injection.
 - C. 1) SG PORVs.
2) Reduce RCS pressure to allow SI Accumulator and LSI pump injection.
 - D. 1) SG PORVs.
2) Reduce secondary to primary D/P across the SG tubesheet.

Question: 24

Given the following:

- Unit 1 is operating at 100% power.
- The reactor is tripped and SI actuated.
- Containment pressure is 25 psia and rising slowly.

Which ONE of the following completes the statement:

1-RM-TV-100C, CTMT ATMOS RM INLET I/S TV, closes on a ____ (1) ____ containment isolation signal, and is checked in the required position using ____ (2) ____ of 1-E-0, Reactor Trip or Safety Injection.

- A. 1) Phase I
2) Attachment 1, System Alignment Verification
- B. 1) Phase I
2) Attachment 4, CLS Component Verification
- C. 1) Phase II
2) Attachment 4, CLS Component Verification
- D. 1) Phase II
2) Attachment 1, System Alignment Verification

Question: 25

Initial Conditions:

- Unit 2 has been tripped and safety injection actuated.
- At Step 6 of 2-E-0, Reactor Trip or Safety Injection, RCS Subcooling is 20°F and lowering.
- Containment pressure is 19 psia and is slowly rising.
- PRZR level is offscale low.
- The Crew has entered 2-ES-1.2, Post LOCA Cooldown and Depressurization.

Current Conditions:

- The Crew has reached Step 14 "DEPRESSURIZE RCS TO REFILL PRZR".

Which ONE of the following completes the statement below:

The RCS is depressurized using ____ (1) ____, until a MINIMUM ____ (2) ____ is reached.

- A. 1) one PRZR PORV
2) Subcooling value
- B. 1) normal PRZR Spray
2) Subcooling value
- C. 1) One PRZR PORV
2) PRZR level
- D. 1) normal PRZR Spray
2) PRZR level

Question: 26

Initial Conditions:

- Unit 1 was at 100% power when Main Steamline breaks occurred on "B" and "C" SGs.
- "B" and "C" SGs were isolated IAW 1-E-2, Faulted Steam Generator Isolation.
- "B" and "C" SG wide-range levels are now 0%.
- RCS Hot Leg temperatures are **rising**.

Current Conditions:

- SI has been terminated per 1-FR-P.1, Response to Imminent Pressurized Thermal Shock Condition.
- 1-FR-P.1 directs controlling feed flow and dumping steam to stabilize RCS Hot Leg temperatures.

Which ONE of the following completes the statement:

The **basis** for stabilizing RCS Hot Leg Temperature is to prevent _____?

- A. loss of RCS subcooling
- B. RCS repressurization
- C. tube failure in the Faulted SGs
- D. voiding in the reactor vessel head

Question: 27

Unit 1 is on Cold Leg Recirculation following a LOCA.

- Containment pressure is 22 psia and slowly lowering.
- Containment sump is 10 feet and slowly rising.
- The crew is performing 1-FR-Z.2, Response to Containment Flooding, and Chemistry is sampling the Containment sump.

In accordance with 1-FR-Z.2, Response to Containment Flooding which ONE of the following describes:

- 1) Containment sump is sampled for __ (1) __ prior to release from containment.
 - 2) What actions should be taken if this containment function is not restored upon completion of the procedure?
-
- A.
 - 1) Activity
 - 2) Exit 1-FR-Z.2, and return to procedure and step in effect.
 - B.
 - 1) Activity
 - 2) Re-perform actions of 1-FR-Z.2 until the containment function is satisfied.
 - C.
 - 1) Total Dissolved Solids
 - 2) Re-perform actions of 1-FR-Z.2 until the containment function is satisfied.
 - D.
 - 1) Total Dissolved Solids
 - 2) Exit 1-FR-Z.2, and return to procedure and step in effect.

Question: 28

Given the following:

- Unit 1 is operating at 29% power.
- 1-RC-P-1A breaker spuriously trips open on overcurrent.

With no operator actions which of the following describes:

- 1) How Loop 'A' Tavg will change as compared to previous Tave Loop 'A'.
- 2) The reason for the Loop 'A' Tavg change?

- A. 1) Lower 2) due to no forced flow in the loop A.
- B. 1) Lower 2) due to reverse flow in the loop A.
- C. 1) Higher 2) due to reverse flow in the loop A.
- D. 1) Higher 2) due to no forced flow in the loop A.

Question: 29

Unit 1 is operating at 100%, Letdown flow orifice configuration is being changed, when the following sequence of events occur:

- 1-CH-HCV-1200C, LETDOWN ORIFICE ISOL valve is opened.
- Annunciator 1D-F4, LO PRESS LETDOWN LINE HI FLOW, alarms, and remains LIT when acknowledged.
- 1-CH-HCV-1200B, LETDOWN ORIFICE ISOL valve is closed.
- Annunciator 1D-F4 clears.

Which ONE of the following states:

- 1) The Maximum Letdown flow limit _____ been exceeded.
- 2) The limit is based on the _____ Bed Ion Exchanger.

A. 1) has
2) Cation

B. 1) has
2) Mixed

C. 1) has not
2) Cation

D. 1) has not
2) Mixed

Question: 30

Given the following:

- Unit 1 is operating at 100%.
- A failure occurs causing Letdown temperature 1-CH-TI-1143 to rise rapidly to 114 °F and rising.
- 1-CH-TCV-1143 is in AUTO.

With no operator action, which of the following completes the statement below?

1-CH-TCV-1143, Letdown Divert Control valve will divert to the __ (1) __, as soon as Letdown temperature exceeds __ (2) __.

- | | | |
|----|------------------------|-----------|
| A. | 1) Volume Control Tank | 2) 130 °F |
| B. | 1) Primary Drain Tank | 2) 130 °F |
| C. | 1) Primary Drain Tank | 2) 145 °F |
| D. | 1) Volume Control Tank | 2) 145 °F |

Question: 31

Initial Conditions:

- Unit 1 is in CSD with the PRZR solid.
- 1-RC-P-1C, "C" RCP running for crud burst cleanup.
- RCS temperature is 158 °F and lowering.
- RCS pressure is 305 psig.
- Station Instrument Air is supplying containment, the CMT IA compressors are in OFF.

Current Conditions:

- Unit 1 Instrument Air header ruptures.

Which ONE of the following completes the statements below:

- 1) RCS pressure will ____ (1) ____.
- 2) Procedure ____ (2) ____ is used to mitigate the effects of this transient.

- A. 1) rise
2) 1-AP-27.00, Loss of Decay Heat Removal Capability
- B. 1) lower
2) 1-AP-27.00, Loss of Decay Heat Removal Capability
- C. 1) rise
2) 0-AP-40.00, Non-Recoverable Loss of Instrument Air
- D. 1) lower
2) 0-AP-40.00, Non-Recoverable Loss of Instrument Air

Question: 32

Given the following:

- Large Break LOCA has occurred on Unit 1 and the crew is presently performing 1-ES-1.3, Transfer to Cold Leg Recirculation.
- RWST level is 14% and lowering slowly.

Which of the following completes the following statements.

- 1) Automatic swaponer to RMT will occur as soon as RWST level transmitters are less than ____ (1) ____.
- 2) During phase 1 of RMT one of the automatic actions the RO should observe is the ____ (2) ____ stroking from CLOSE to OPEN.

- A. 1) 13.5%
2) LHSI suction from SUMP MOVs, 1-SI-MOV-1860A and B
- B. 1) 13.0%
2) LHSI suction from SUMP MOVs, 1-SI-MOV-1860A and B
- C. 1) 13.5%
2) LHSI discharge to HHSI MOVs, 1-SI-MOV-1863A and B
- D. 1) 13.0%
2) LHSI discharge to HHSI MOVs, 1-SI-MOV-1863A and B

Question: 33

The Unit is operating at 100% power when a reactor trip and safety injection occur.

Which ONE of the following completes the statement below?

Following safety injection actuation, RCP seal return is directed to the ____ (1) ____, through a relief valve set at ____ (2) ____ psig.

- A. 1) PDT
2) 75
- B. 1) PDT
2) 150
- C. 1) PRT
2) 75
- D. 1) PRT
2) 150

Question: 34

Which ONE of the following describes the operation of the Component Cooling Water Service Water Supply MOVs, 1-SW-MOV-102 A and B?

- 1) Close on a Unit 1 HI-HI CLs in coincidence with a loss of RSST ____ (1) ____.
- 2) After a MINIMUM time delay of ____ (2) ____ minutes, the valves may be reopened from the MCR.

A. 1) A & C
2) 5

B. 1) A & C
2) 2

C. 1) B & C
2) 5

D. 1) B & C
2) 2

Question: 35

Initial Conditions:

- Unit 1 is operating at 100% Power.
- PRZR Heater Group "C" and "D" are in ON.
- PRZR Heater Group "A", "B", and "E" are in AUTO.
- Loss of off-site power occurs.

Current Conditions:

- The Crew is performing actions in accordance with 1-ES-0.1, Reactor Trip Response, and 1-AP-10.07, Loss of Unit 1 Power.
- RCS Pressure is 2000 psig and lowering slowly.

Which ONE of the following describes the 1A Pressurizer Heater Group operation?

- A. Will have power available, **NO** actions are required to energize them.
- B. Will have power available **AND** manual actions are required to energize them.
- C. Will **NOT** have power available. Manual actions are required to align power to them but **NO** other actions are required to energize them.
- D. Will **NOT** have power available. Manual actions are required to align power to them **AND** manual actions are required to energize them.

Question: 36

Given the following:

- Reactor power is 100%.
- Pressurizer Pressure control is in automatic.
- An internal fault causes 1-RC-PC-1444J to fail as shown.

Which ONE of the following describes the immediate response of the Pressure Control System.

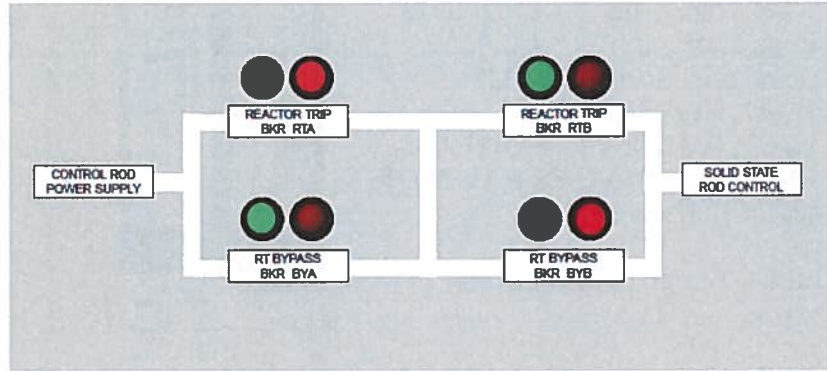
- Power operated relief valve 1-RC-PCV-1455C opens, spray valves open, pressurizer heaters de-energize.
- Power operated relief valve 1-RC-PCV-1456 opens, spray valves open, pressurizer heaters de-energize.
- Spray valves open, pressurizer heaters de-energize.
- Spray valves close, pressurizer heaters energize.



Question: 37

Initial Conditions:

- 5% Power, with reactor trip breaker status as shown:



Current conditions:

- The 'A' DC bus loses power/de-energizes.

Based on the current conditions, which one of the following is the automatic response of the Reactor Protection System?

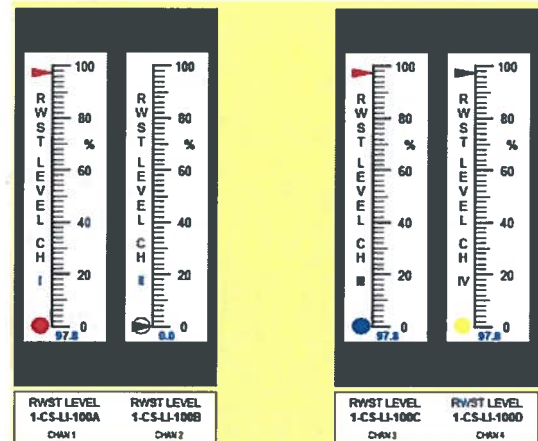
	<u>'A' Reactor Trip Breaker</u>	<u>'B' Reactor Trip Bypass Breaker</u>
A.	OPEN	CLOSED
B.	CLOSED	OPEN
C.	CLOSED	CLOSED
D.	OPEN	OPEN

Question: 38

Given the following:

- Unit 1 is operating at 100% power.
- RWST Level Transmitter 1-CS-LT-100B has failed as shown.
- The following annunciators are LIT:
 - 1A-A7, RWST LO LVL.
 - 1A-B2, RMT CH2 TRIP/BYPASS.
 - 1B-F4, RWST LVL RS PP START INTLK CH2.

The channel HAS NOT been placed in TRIP or BYPASS at this time.



If another RWST Level Transmitter channel fails LOW, before action has been taken for the first RWST Level Transmitter failure, Recirc Spray pumps __ (1) __ start, and Recirc Mode Transfer (RMT) __ (2) __ occur.

	<u>Recirc Spray</u>	<u>RMT</u>
A.	will NOT	will NOT
B.	will NOT	will
C.	will	will
D.	will	will NOT

Question: 39

Given the following:

- Unit 1 operating at 100% power, Unit 2 is in HSD preparing for reactor startup.
- Unit 1 Containment is on Chilled CC; 1-CD-REF-1A, York 400 ton Chiller, is in service.
- Unit 1 Reactor trips due to a turbine control malfunction.
- Upon entering 1-ES-0.1, Reactor Trip Response, the RO notes that Load Shed has failed to actuate.
- The BOP initiates 0-AP-10.10, Loss of Auto Load Shed.

Which ONE of the following describes:

- 1) The location of 1-CD-REF-1A, York 400 Ton Chiller, breaker control switch.
 - 2) The major components affected if 1-CD-REF-1A breaker is jammed closed and the Bus must be de-energized to secure the Chiller?
-
- A. 1) Control Panel on the Turbine Building Mezzanine.
2) "B" RCP and "B" MFP.
 - B. 1) Control Panel on the Turbine Building Mezzanine.
2) "A" RCP and "A" MFP.
 - C. 1) Breaker cubicle in the Normal Switchgear Room.
2) "B" RCP and "B" MFP.
 - D. 1) Breaker cubicle in the Normal Switchgear Room.
2) "A" RCP and "A" MFP.

Question: 40

Initial Conditions:

- Unit 1 was operating at 100%.
- The following annunciators alarmed.
 - 1K-A7, BATT SYSTEM 1A TROUBLE.
 - 1K-A8, UPS SYSTEM 1A TROUBLE.
 - 1K-G7, 480 EMERG BUS MCC BKR TRIP.
 - VSP-E8, CVCS HT TRACE TRBL.
- Multiple loads are lost on Unit 1.

Current Conditions (1 min later):

- The RO reports the following Ventilation Fans have lost power:
 - 1-VS-F-40A, Safeguard Exh Fan.
 - 1-VS-F-60A, CRDM FAN.
 - 1-VS-F-60F, CRDM FAN.
- CRDM FAN 1-VS-F-60E is the only CRDM Fan running.

Which ONE of the following completes the statement below.

- 1) Which procedure should be entered to address all the conditions listed above?
- 2) The standby CRDM Fans _____ automatically start.

- A.
 - 1) 1-AP-10.07, Loss of Unit 1 Power.
 - 2) will
- B.
 - 1) 1-AP-10.07, Loss of Unit 1 Power.
 - 2) will NOT
- C.
 - 1) 1-AP-25.00, Loss of Containment Air Cooling.
 - 2) will
- D.
 - 1) 1-AP-25.00, Loss of Containment Air Cooling.
 - 2) will NOT

Question: 41

Initial Conditions:

- Unit 1 operating at 65%, ramping up to full power.
- A Large Break LOCA occurs.

Current Conditions: (3 minutes later)

- "C" RSST Trips.
- Containment pressure peaks at 42 psia and is slowly lowering.

Which ONE of the following states the power source to the CS pumps?

1-CS-P-1A

- A. Offsite power
- B. Offsite power
- C. #1 EDG
- D. #1 EDG

1-CS-P-1B

- Offsite power
- #3 EDG
- Offsite power
- #3 EDG

Question: 42

Given the following:

- Unit 1 Turbine Control is in IMP IN.
- Control rods are in MANUAL.
- The following parameters are given:

<u>Rx. Pwr</u>	<u>Delta T</u>	<u>Tave</u>	<u>T ref.</u>	<u>Gen MWe</u>
89%	90%	569.7	569.7	784

- 1-MS-SOV-104, MSR Steam Supply fails CLOSED.

With no operator action which ONE of the following parameters would be higher when steady-state conditions are reached?

- A. Reactor Power.
- B. Generator MWe.
- C. T ref.
- D. Tave.

Question: 43

Unit 1 reactor power is 100%, when a spurious reactor trip occurs.

Which ONE of the following completes the following statement.

The P-4 signal is generated by a direct input from the __ (1) __ breakers being open, and the MFRVs will close when __ (2) __.

- | | | |
|----|---------------------|------------------------------|
| A. | 1) Generator output | 2) 2/3 RCS Loop Tave < 543°F |
| B. | 1) Generator output | 2) Median Tave < 554°F |
| C. | 1) Reactor trip | 2) Median Tave < 554°F |
| D. | 1) Reactor trip | 2) 2/3 RCS Loop Tave < 543°F |

Question: 44

Initial Conditions at 0800:

- Unit 1 at 50% power.
- 1-FW-P-1B, Main Feedwater pump is running, 1-FW-P-1A is secured.
- 1-FW-P-1B, Main Feedwater Pump discharge valve inadvertently closes.
- 1-FW-P-1B, Main Feedwater Pump Recirc valve fails to open.

Current Conditions at 0805:

- 'A' S/G NR level = 23% and lowering.
- 'B' S/G NR level = 19% and lowering.
- 'C' S/G NR level = 15% and lowering.

Which ONE of the following completes the following statement:

Based on the above plant conditions, at 0801 __ (1) __ pump(s) will be running, and at 0805 __ (2) __ pump(s) will be running.

- A. 1) 1-FW-P-2, TDAFW
2) 1-FW-P-2, 1-FW-P-3A, AND 1-FW-P-3B
- B. 1) 1-FW-P-3A, AND 1-FW-P-3B MDAFW
2) 1-FW-P-3A, AND 1-FW-P-3B MDAFW
- C. 1) 1-FW-P-2, TDAFW
2) 1-FW-P-2, TDAFW
- D. 1) 1-FW-P-3A, AND 1-FW-P-3B MDAFW
2) 1-FW-P-2, 1-FW-P-3A, AND 1-FW-P-3B

Question: 45

Initial Conditions:

- Unit 1 tripped from 100% due to a Generator Trip.
- Following the Trip the 1J bus locked out.
- NLO dispatched AND completed AFW J Header isolation in accordance with ES-0.1.
- AFW initially throttled to 200 gpm/S/G.

Current Conditions:

- S/G 'A', 'B', and 'C' all read 12% NR and slowly rising.

Which of the following completes the statements below.

- 1) Per ES-0.1, Reactor Trip response the AFW header isolation was done by closing __ (1) __ header isolation valve(s).
- 2) With current conditions, as the AFW MOV's are throttled to control S/G level, AFW pump discharge pressure will __ (2) __ .

- | | | |
|----|----------|----------|
| A. | 1) one | 2) lower |
| B. | 1) three | 2) rise |
| C. | 1) three | 2) lower |
| D. | 1) one | 2) rise |

Question: 46

In accordance with 1-AP-21.01, Response to AFW Check Valve Backleakage, which ONE of the following completes the statements below?

An AFW pump is considered vapor bound if casing temperature exceeds ____1)____. If ALL AFW Pumps are vapor bound, ____2)____ AFW pump(s) should be cooled **FIRST**.

- A. 1) 200°F
2) Motor Driven
- B. 1) 200°F
2) Turbine Driven
- C. 1) 165°F
2) Motor Driven
- D. 1) 165°F
2) Turbine Driven

Question: 47

Given the following:

- 1-RH-P-1A, RHR pump 'A' is operating during a plant cooldown.
- The DC control power breaker supplying RHR Pump 'A' trips.

Which ONE of the following complete the statements below:

- 1) Main Control Board red/green running indication will be __ (1) __.
- 2) If 1-RH-P-1A were tripped locally, then the pump __ (2) __ be restarted locally by pulling the breaker MANUAL CLOSE lever.

- A. 1) lost 2) could
- B. 1) available 2) could not
- C. 1) available 2) could
- D. 2) lost 2) could not

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Question: 48

Unit 1 and 2 are operating at 100% power when a Loss of Off-Site Power (LOOP) occurs.

- #3 EDG is tagged out for a major maintenance package.
- #1 EDG developed an oil leak and was tripped.
- The AAC Diesel has been aligned to one Emergency Bus.

Which ONE of the following identifies the Station Battery bus, or busses, with a continuously lowering DC voltage?

	<u>UNIT 1</u> <u>Battery</u> <u>Bus</u>	<u>UNIT 2</u> <u>Battery</u> <u>Bus</u>
A.	A	B
B.	B	B
C.	B	A
D.	A	A

Question: 49

Given the following:

- Unit 2 is operating at 100% power.
- 2B DC bus inadvertently de-energized.
- Unit 2 reactor trips.

Which ONE of the following completes the statement:

The turbine is tripped ____ (1) ____, and the generator output breakers ____ (2) ____ open automatically.

- A. 1) manually 2) will
- B. 1) manually 2) will not
- C. 1) automatically 2) will
- D. 1) automatically 2) will not

Question: 50

Initial Conditions:

- The crew is in 1-E-1, Loss of Reactor or Secondary Coolant, at Step 6.
- RCS pressure is 115 psig and lowering.
- Containment pressure is 30 psia and rising.
- RWST level is 50% and lowering.

Current Conditions:

- Breaker 15H8, Normal supply to 1H 4160v bus tripped (10 sec. ago) and breaker 15H3, #1 EDG output breaker closed.

Which of the following describes:

- 1) The first load that will be sequenced onto #1 EDG.
 - 2) The maximum continuous running electrical load allowed for #1 EDG.
-
- A. 1) 1-VS-F-58A, Filtered Exhaust Fan
2) 2600 KW.
 - B. 1) 1-RS-P-2A, Outside Recirc Spray pump.
2) 2750 KW.
 - C. 1) 1-RS-P-2A, Outside Recirc Spray pump.
2) 2600 KW.
 - D. 1) 1-VS-F-58A, Filtered Exhaust Fan
2) 2750 KW.

Question: 51

Given the following:

- Both Units are operating at 100%.
- Normal Ventilation lineup.
- Annunciator 0-RM-L4, VENT VENT 1 GAS ALERT/FAILURE has just alarmed.
- Indications for 1-VG-RJ-104 are as shown below.



Which ONE of the following describes:

- 1) The effluent release path that is monitored by this radiation monitor ___(1)___ be automatically isolated.
 - 2) What type of detector failure could cause the indications shown?
- 1) will
 - 2) No pulses provided by the detector for five minutes.
- 1) will
 - 2) Large rise in pulses causing detector saturation.
- 1) will not
 - 2) Large rise in pulses causing detector saturation.
- 1) will not
 - 2) No pulses provided by the detector for five minutes.

Question: 52

Initial Conditions:

- A Stop Log is installed in the 1A Screenwell.

Current Conditions:

- The 1C Screenwell is 90% fouled/blocked by Hydroids.

Based on current conditions, which ONE of the following will indicate a rise in temperature?

- A. Main Control Room Chillers.
- B. Charging Pump Lubricating Oil.
- C. Bearing Cooling Water cooled components.
- D. Component Cooling Water cooled components.

Question: 53

Initial Conditions:

- 1-SW-P-10A, CHG Pump SW Pump, is running in HAND
- 1-SW-P-10B, CHG Pump SW Pump is in AUTO and OFF.
- 1D-G5, SW or CC PPS DISCH TO CHG PPS LO PRESS has just alarmed.

Current Conditions (2 minutes later):

- 1-SW-P-10A, CHG Pump SW Pump, continues running in HAND.
- 1-SW-P-10B, CHG Pump SW Pump is in AUTO and OFF.
- The Service Building Inside Operator reports the following readings:

<u>Parameter</u>	<u>Previous</u>	<u>Current</u>	<u>Log spec</u>
1-SW-DPI-100A, 1-VS-S-1A, SW Strainer D/P	0.8 psid	0.8 psid	Max: 1.5 psid
1-SW-DPI-27, 1-SW-S-2A, SW Suct. Strainer D/P	0.2 psid	1.8 psid	Max: 1.5 psid
1-SW-PI-140A, 1-SW-P-10A, Suction press	3.8 psig	0.8 psig	Min: -5 psig
1-SW-PI-26, 1-SW-P-10A, discharge pressure	27.5 psig	6 psig	Min: 15 psig

Which of the following describes the actions the operator must take per 0-AP-12.00, Service Water System Abnormal Conditions?

- Start 1-SW-P-10B, place duplex strainer 1-SW-S-10 in service, and open 1-SW-263 Suction Cross-tie.
- Place 1-SW-S-2A, suction strainer standby basket in service, and vent 1-SW-P-10A.
- Start 1-SW-P-10B, stop and vent 1-SW-P-10A, place 1-SW-S-2A, suction strainer standby basket in service.
- Place additional SW header in service, vent all three SW headers, vent 1-SW-P-10A Chg SW pump.

Question: 54

Which ONE of the following states the power source for Station Instrument Air Compressor, 2-IA-C-1?

- A. 480V Bus 2C3.
- B. 480V Bus 2A2.
- C. 480V Bus 2H1-1.
- D. 480V Bus 2J1-1.

Question: 55

Initial Conditions:

- Unit 2 was operating at 100%.
- An Auto Reactor Trip and Safety Injection occurred.
- The First out annunciator was 2E-G8, RX TRIP PRZR LO PRESS.

Current Conditions (1 minute later)

- RCS pressure is 10 psig and lowering.
- Containment Pressure is 45.0 psia and slowly rising.
- RWST level is 95% and lowering.
- The following additional annunciators have just alarmed:
 - 2K-F4, 4KV EMERG BUS NOR SUP AUTO TRIP.
 - 2K-G4, 4KV EMERG BUS EMERG SUP BKR AUTO TRIP.
 - 2K-H1, BUS 2H UNDERVOLT.
- The RO reports that EDG #2 is running but has failed to close in to supply Bus 2H.

Which of the following describes:

- 1) How many Containment Air Recirculation Fans are operating at this time.
- 2) With the current complement of ESF equipment how long will it take to reduce containment pressure to subatmospheric?

- | | |
|------------|-------------|
| A. 1) One. | 2) 4 hours. |
| B. 1) Two. | 2) 8 hours. |
| C. 1) One. | 2) 8 hours. |
| D. 1) Two. | 2) 4 hours. |

Question: 56

Given the following:

- Unit 1 is operating at 100% power.
- Rod Control is in AUTO.
- NLO reports the "Urgent Failure" light is lit on Power Cabinet 1AC.
- NLO reports normal indications for all other Power and Logic Cabinets.

Which of the following describes the effect of this on movement of Bank "D" rods?

- A. Bank D rods can be moved in ANY mode.
- B. Bank D rods can be moved in MAN only.
- C. Bank D rods can be moved in Bank Select only.
- D. Bank D rods CANNOT be moved in any Mode.

Question: 57

Given the following:

- A steam generator tube rupture has occurred.
- Due to multiple failures, the PRZR spray and PORVs are unavailable to depressurize the RCS.
- PRZR level is offscale low.
- The Crew is attempting to re-establish Letdown flow in accordance with ECA-3.3, SGTR with loss of Pressure Control.

In accordance with 1-ECA-3.3, which ONE of the following identifies:

- 1) The _____ fuses for LC-1-460C and LC-1-459C are removed.
- 2) 1-CH-LCV-1460A and B _____.

- A. 1) input
2) open automatically
- B. 1) input
2) are opened manually
- C. 1) output
2) open automatically
- D. 1) output
2) are opened manually

Question: 58

Given the following:

- Unit 2 is in a Refueling Outage.
- The crew is currently filling the cavity and making preparations to offload the core.
- Power Range NI channel 2 is removed from service for troubleshooting.
- I&C requests permission to remove U2 Power Range NI channel 1 from service to perform a calibration of the channel.

Which ONE of the following answers the questions below:

- 1) What impact (if any) will removing U2 Power Range Channel 1, from service have on NI system operation?
- 2) For core offload ____ Source range NI channel(s) is (are) required to be OPERABLE.

- A. 1) No impact. Power range channels are not required to be Operable in Refueling.
 2) one
- B. 1) No impact. Power range channels are not required to be Operable in Refueling.
 2) two
- C. 1) Insert a P-10 signal which will de-energize both Source Range channels.
 2) one
- D. 1) Insert a P-10 signal which will de-energize both Source Range channels.
 2) two

Question: 59

Initial Conditions

- Unit 1 is operating at 100% power.
- A Large Break LOCA occurs.
- Unit 1 reactor is tripped and safety injection actuated.
- Breaker 15H8, 1H Emergency Bus normal supply breaker trips on overcurrent.
- #1 EDG output breaker will NOT close.

Current Conditions

- The Crew has entered 1-E-1, Loss of Reactor or Secondary Coolant.
- The Containment Hydrogen Analyzer has been placed in service.

Which ONE of the following completes the statement:

The number of Containment Hydrogen recombiners that can be placed in service is ____ (1) ____; at a MINIMUM hydrogen concentration of ____ (2) ____% inside Containment.

- A. 1) 1
2) 4.0
- B. 1) 2
2) 4.0
- C. 1) 2
2) 0.5
- D. 1) 1
2) 0.5

Question: 60

Initial Conditions:

- The reactor is operating at 100% power.
- Rod Control is in Manual for I&C troubleshooting.
- A turbine control malfunction causes Impulse pressure to drop suddenly to 83%.

Current Conditions:

- RCS Tave is 575°F; Tref is 568.6°F.
- No Operator Action is taken.

Which ONE of the following describes the response of the Steam Dumps to these conditions?

- A. 1-MS-TCV-105 A/B are partially open.
- B. 1-MS-TCV-105 A/B are full open, 1-MS-TCV-106 A/B are partially open.
- C. Steam Dumps are closed, Steam Dump Demand is 13%.
- D. Steam Dumps are closed, Steam Dump Demand is 32%.

Question: 61

Given the following:

- Unit 1 is at 90% power with steady-state conditions.
- Control Bank D rods are at 227 steps.
- The crew is preparing to ramp to 100%.

Which of the following completes the statement below?

As turbine load is raised to 100%, main steam header pressure __ (1) __, and MTC will become __ (2) __.

	<u>Main Steam Header Pressure</u>	<u>MTC</u>
A.	1) lowers	2) more negative
B.	1) rises	2) less negative
C.	1) lowers	2) less negative
D.	1) rises	2) more negative

Question: 62

Given the following:

- Unit 1 is operating at 100%.
- Condenser Vacuum is 27.6 inches Hg and is lowering 0.4 inches Hg/minute.
- Turbine 1 and 2 operators dispatched to look for leaks.
- Generator Megawatts are 890 Mwe and lowering rapidly.
- Annunciator 1A-G1, Traveling Screens Hi Diff Lvl is Lit.

Which of the following completes the following statements:

- 1) __ (1) __ is required to be entered.
- 2) 1-E-0 is required to be entered if Main Condenser Vacuum lowers to __ (2) __.

- A.
 - 1) 0-AP-12.01, Loss of Intake Canal Level
 - 2) 25.0 in-Hg
- B.
 - 1) 0-AP-12.01, Loss of Intake Canal Level
 - 2) 22.5 in-Hg
- C.
 - 1) 1-AP-14.00, Loss of Main Condenser Vacuum
 - 2) 25.0 in-Hg
- D.
 - 1) 1-AP-14.00, Loss of Main Condenser Vacuum
 - 2) 22.5 in-Hg

Question: 63

Unit 1 is operating at 100% when the Reactor Operator notices that Main Feed Pump suction pressure has lowered on both Main Feed pumps and is now reading 400 psig (20 psig lower than before).

Which one of the following identifies a possible cause for this lower reading.

- A. 1-SD-LCV-106, HP Heater Drain Pump Level Control valve fails OPEN.
- B. 1-CN-FCV-107, Condensate Recirculation valve inadvertently opened.
- C. 1-CP-MOV-100, Condensate Polisher Bypass valve fails OPEN.
- D. 1-CN-126, Condensate bypass for LP FW Heaters 2, 3 and 4 inadvertently opened.

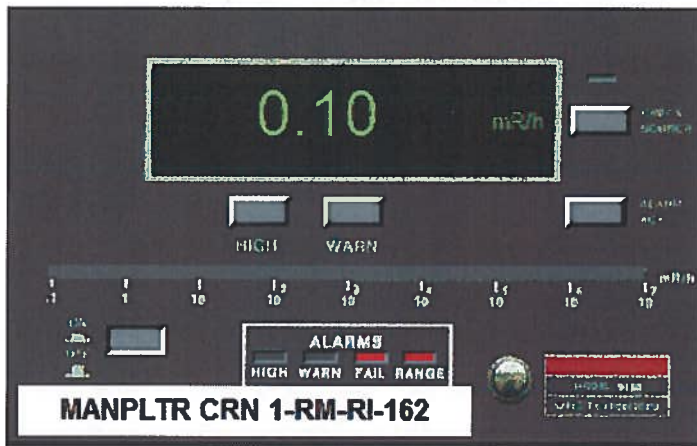
Question: 64

Initial Conditions:

- Unit 1 is in CSD, PRZR level at 5%, with RCS draindown to 18 feet in progress.
- CTMT is on purge using 1-VS-F-59, Aux Bldg (CAT 2) Filter Fan.
- Annunciator RM-J8, MANPLTR CRN ALERT/FAILURE alarms.

CURRENT CONDITIONS

- The Unit 2 BOP notes the following indication:



Which ONE of the following completes the statement:

The Unit 1 CTMT purge MOVs are ____1)____, and 1-VS-F-59 is ____2)____.

- A. 1) closed
2) tripped
- B. 1) closed
2) running
- C. 1) open
2) tripped
- D. 1) open
2) running

Question: 65

Initial Conditions:

- Unit 1 Startup in progress, with power at 6%. Unit 2 is operating at 100% power.
- The Turbine was just latched and the crew is preparing to bring the Main Generator on line.
- A Lightning strike at the Low Level intake has resulted in loss of all Circ Water pumps.
- Operators have been dispatched to attempt to start ESW pumps.

Current Conditions:

- The following Unit 1 annunciators have just alarmed:
 - 1F-H7, INTK CANAL LO LVL CH-1.
 - 1F-H8, INTK CANAL LO LVL CH-2.
 - 2F-H7, INTK CANAL LO LVL CH-3.
 - 2F-H8, INTK CANAL LO LVL CH-4.
 - 1F-G1, INTK CANAL LO LVL TRIP.
 - 2F-G1, INTK CANAL LO LVL TRIP

With no operator action, which of the following completes the statement below.

At this time the Unit 1 Reactor __ (1) __ tripped. All service water flow paths through the station are isolated except __ (2) __ .

- | | |
|--------------|--------------------------------|
| A. 1) is | 2) Bearing cooling water |
| B. 1) is not | 2) Charging pump service water |
| C. 1) is | 2) Charging pump service water |
| D. 1) is not | 2) Bearing cooling water |

Question: 66

Initial Conditions:

- Unit 1 reactor is operating at 100% power.
- At 1122 the Plant Computer fails.
- The Crew initiates 1-AP-20.02, Loss of the Unit 1 Plant Computer.

Current Conditions: (18 hours later)

- The Plant Computer Vendor and I&C are working to restore the Plant Computer.
- All programs and displays are out of service.

Per 1-AP-20.02, Loss of the Unit 1 Plant Computer, which ONE of the following completes the statements:

___1)___ is/are monitored each hour. The crew will monitor Reactor Power in accordance with ___2)___ .

- A. 1) Charging Pump bearing temperatures
2) 1-OPT-RX-004, Rx Power Calorimetric Using Feed Flow with PCS Out of Service
- B. 1) Delta Flux
2) 1-OPT-RX-007, Shift Average Power Calculation
- C. 1) Delta Flux
2) 1-OPT-RX-004, Rx Power Calorimetric Using Feed Flow with PCS Out of Service
- D. 1) Charging Pump bearing temperatures
2) 1-OPT-RX-007, Shift Average Power Calculation

Question: 67

Which ONE of the following completes the statement from 1-GOP-1.4, Unit Startup, HSD to 2% Reactor Power, concerning the Reactivity Plan provided by Reactor Engineering?

The plan shall contain recommendations for control of Delta Flux, rod height and/or Boron adjustments, and _____.

- A. expected Xenon transient
- B. startup rate limitations
- C. RCS temperature control
- D. source range counts at doubling points

Question: 68

Given the following:

- Unit 2 has tripped due to a FW Heater break.
- Unit 2 Turbine Building basement has been evacuated and quarantined for personnel safety.
- Unit 1 has lost both Charging Pump SW pumps due to electrical failure, and restoration is unlikely.

Which ONE of the following will answer the following questions:

- 1) Which valve must be operated to cross-tie Charging Pump SW from Unit 2 to Unit 1?
- 2) What is the location of the valve?

- A. 1) 2-SW-443, 1(2)-SW-P-10B pump discharge cross tie valve.
2) MER 4.
- B. 1) 1-SW-269, 1(2)-SW-P-10A pump discharge cross tie valve.
2) MER 4.
- C. 1) 1-SW-269, 1(2)-SW-P-10A pump discharge cross tie valve.
2) MER 3.
- D. 1) 2-SW-443, 1(2)-SW-P-10B pump discharge cross tie valve.
2) MER 3.

Question: 69

According to surveillance procedure 1-OPT-RC-10.00, Reactor Coolant Leakage-Computer Calculated, which of the following parameters is an input into the calculation for IDENTIFIED RCS leakage?

- A. Pressurizer Level.
- B. VCT Level.
- C. Pressurizer Relief Tank Level.
- D. Containment Sump Level.

Question: 70

Unit 1 is operating at 100% power.

- 1-RC-MOV-1536, 1-RC-PCV-1455C PRZR PORV block valve, is being closed in accordance with 1-IPT-FT-RC-P-403, Rx. Coolant System Pressure Loop Functional Test.
- Shortly after the Operator attempts to close the MOV, 1-RC-MOV-1536 stops moving and is stuck in an intermediate position.

Which ONE of the following completes the statement below:

1-RC-MOV-1536 must be returned to OPERABLE within ____ (1) ____ minutes, or the ____ (2) ____ is placed in MANUAL.

- A. 1) 60 2) 1-RC-PCV-1455C control switch
- B. 1) 60 2) Master Pressure Controller
- C. 1) 15 2) 1-RC-PCV-1455C control switch
- D. 1) 15 2) Master Pressure Controller

Question: 71

Given the following:

- Unit 1 is at 100% power.
- Containment Spray pump 1-CS-P-1A is being tagged out for maintenance.
- 1-CS-P-1A breaker is racked in.
- The next step in the tagging process is to close Containment Spray Suction Valve, 1-CS-MOV-100A.

Using the schematic drawing for 1-CS-MOV-100A, select the ONE choice that completes the following statements.

- 1) If the operator places the handswitch for 1-CS-MOV-100A to CLOSE momentarily, then releases the handswitch, the MOV __ (1) __ stroke fully CLOSED.
- 2) The breaker for 1-CS-P-1A must be racked in and __ (2) __ in order for the MOV to stroke CLOSED.

(REFERENCE PROVIDED)

- | | | |
|----|-------------|-----------|
| A. | 1) will | 2) CLOSED |
| B. | 1) will not | 2) CLOSED |
| C. | 1) will | 2) OPEN |
| D. | 1) will not | 2) OPEN |

Question: 72

Which ONE of the following identifies:

- 1) The Federal Annual Limit for Dose to the Skin (REM)?
- 2) The TEDE Emergency Exposure Limit to save valuable equipment in accordance with EPIP-4.04, Emergency Personnel Radiation Exposure (REM)?

A. 1) 5
2) 10

B. 1) 50
2) 10

C. 1) 5
2) 25

D. 1) 50
2) 25

Question: 73

Given the following:

- You are assigned as a reflash watch for the next 30 minutes in the Emergency Switchgear room.
- An Event occurs that results in declaration of a Site Area Emergency.

With respect to establishing Accountability which ONE of the following describes:

- 1) Your response to the Site Evacuation alarm.
 - 2) The time limit to complete Accountability.
-
- A.
 - 1) Remain on station, and phone in badge # to Security.
 - 2) 60 minutes.
 - B.
 - 1) Report to the Operations Support Center (OSC).
 - 2) 60 minutes.
 - C.
 - 1) Remain on station, and phone in badge # to Security.
 - 2) 30 minutes.
 - D.
 - 1) Report to the Operations Support Center (OSC).
 - 2) 30 minutes.

Question: 74

In accordance with OP-AP-104, Emergency and Abnormal Operating Procedures:

- 1) The EOP network is entered by procedure E-0, Reactor Trip or Safety Injection or __ (1) __.
- 2) Substeps of Emergency Operating Procedure that are designated by __ (2) __ must be performed in order.

- A.
 - 1) FR-S.1, Response to Nuclear Generation ATWS
 - 2) letters or numbers
- B.
 - 1) ECA-0.0, Loss of All AC Power
 - 2) bullets or asterisks
- C.
 - 1) FR-S.1, Response to Nuclear Generation ATWS
 - 2) bullets or asterisks
- D.
 - 1) ECA-0.0, Loss of All AC Power
 - 2) letters or numbers

Question: 75

Given the following:

- 0130 Unit 1 was at 100% power when a spurious Safety Injection occurred.
- 0131 The crew enters 1-E-0, Reactor Trip or Safety Injection.
- 0145 The crew transitions to 1-ES-1.1, SI Termination.
- 0155 The RCS is solid and PRZR PORV, 1-RC-PCV-1456 begins to cycle.
- 0158 HHSI flow has been isolated and charging placed in service.
- 0212 While placing letdown in service 1-RC-PCV-1456 opens and will not close.
- 0217 The block valve for 1-RC-PCV-1456 will not close.
 - RCS pressure is 1000 psig and lowering rapidly.
 - All steam generators are at 900 psig and slowly lowering.

Which ONE of the following describes the correct actions and procedure implementation.

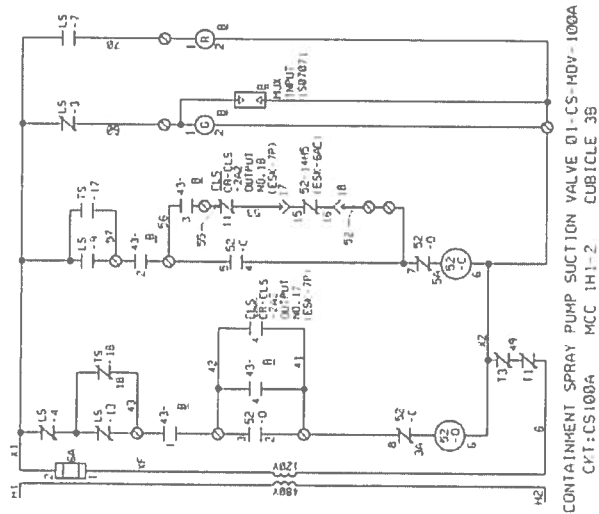
- A. Initiate Safety Injection and go to 1-E-0, Reactor Trip or Safety Injection.
- B. Transition to 1-E-1, Loss of Reactor or Secondary Coolant, and use 1-E-1 guidance to reinitiate Safety Injection.
- C. Manually start charging pumps and align HHSI flow path, and go to 1-ES-1.2 Post LOCA Cooldown and Depressurization.
- D. Manually start charging pumps and align HHSI flow path, and go to 1-E-1, Loss of Reactor or Secondary Coolant.

RO EXAM

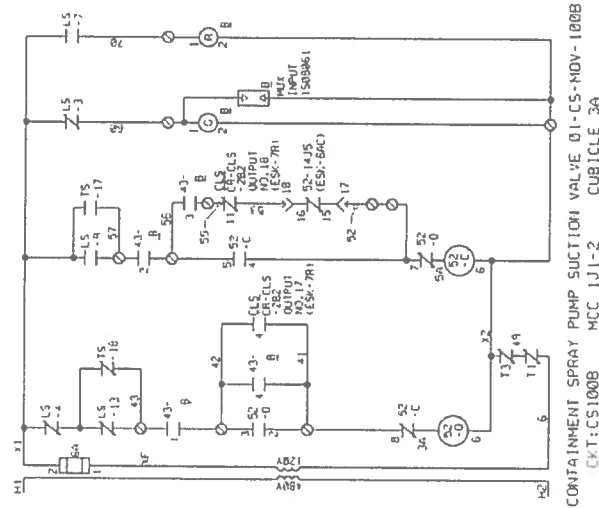
LIST OF ATTACHMENTS

Attachment #	Attachment Description
1	11448-ESK-6BQ SH1, 1-CS-MOV-100A & B
	11448-ESK-6AC, CONTAINMENT SPRAY PUMPS
	11448-ESK-3D, CONTROL SWITCH DIAGRAM
2	ECA-1.1, Attachment 1, Minimum SI flow rate
3	Capability Curves
Separate	STEAM TABLES

ATTACHMENT 1



CONTAINMENT SPRAY PUMP SUCTION VALVE 01-CS-HDV-100A
CXT:CS100A MCC 1H1-2 CUBICLE 3B



CONTAINMENT SPRAY PUMP SUCTION VALVE 01-CS-MOV-100B
CKT:CS100B MCC J1-2 CUBICLE 3A

NOTE: THIS DRAWING SUPERSEDES IN PART 11448-ESK-68Q.

NOTES:

1. ALL VALVES SHOWN IN FULLY CLOSED POSITION.
2. ADJUST LIGHT INDICATION TO ACTIVATE AS CLOSE AS POSSIBLE TO THE END OF VALVE STROKE.
3. ALL PERCENTAGES OF VALVE STROKE ARE REFERENCED FROM THE FULL CLOSED POSITION. 100% = FULL CLOSED
4. SETTING (LS-4) IS APPROXIMATELY VALVE SHALL BE SET TO FULLY OPEN BUT NOT BACKSEAT.

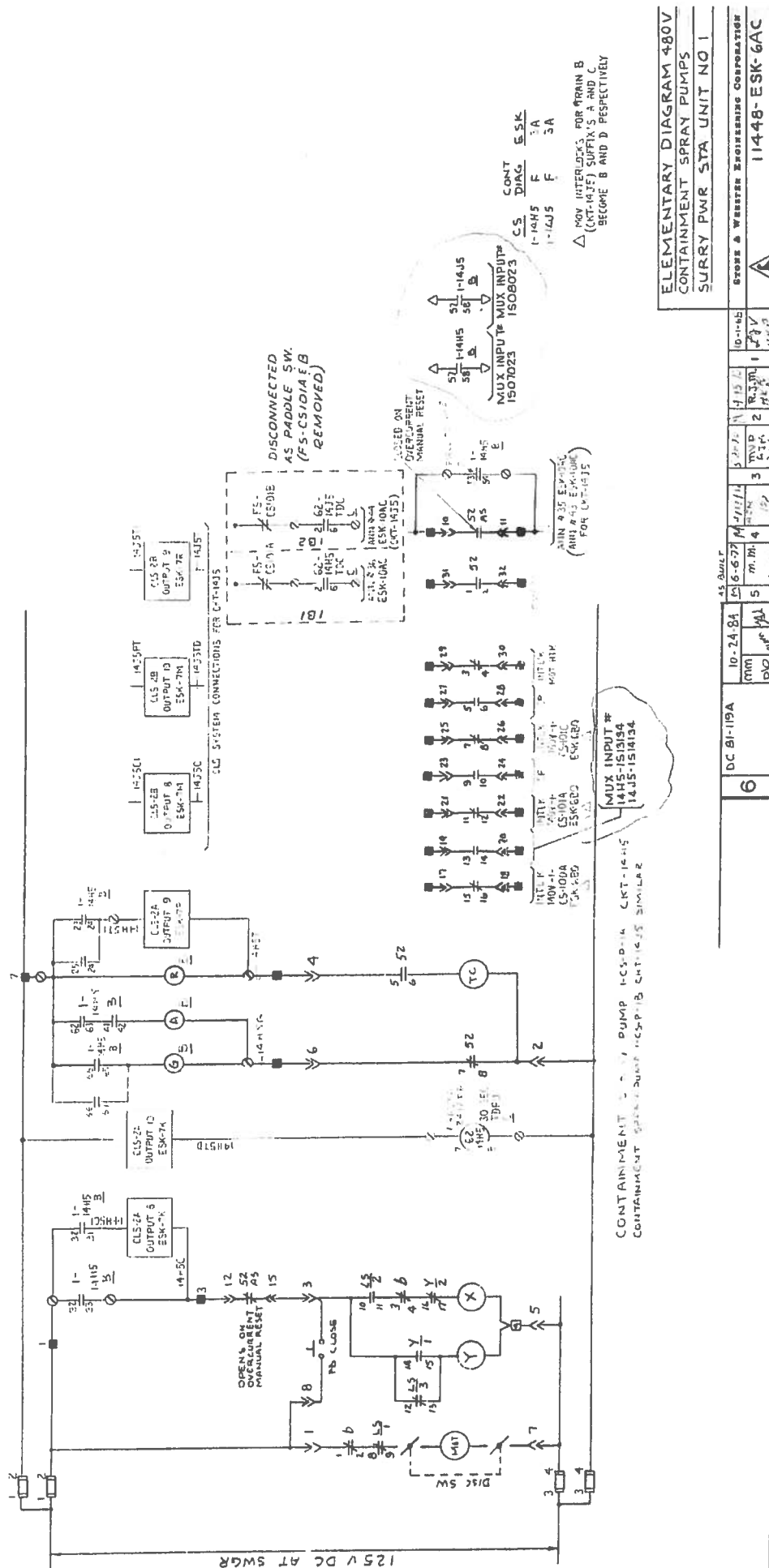
SAFETY RELATED

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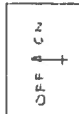
The schematic diagram illustrates a control circuit for a motor. The main power supply is connected to terminals H1 and H2, with a 480V/120V transformer. The circuit includes several interlocking switches (LS-4, LS-13, LS-17, LS-18, LS-3, LS-7) and a thermal switch (TS). A fuse (6A) is located near the H1 terminal. The control sequence involves a sequence of relays and contactors: XF (contactor), CR-CLS-2A2 (interlocking relay), CR-CLS-2A2 (output relay), and CR-CLS-2A2 (output relay). The motor is represented by a circle with '52' and '-0' inside, and is controlled by a contactor (52-C) and a thermal switch (52-14H5). The circuit is protected by a 3A fuse (3A) and a 5A fuse (5A). The motor is connected to terminals X1 and X2.

2

ATTACHMENT 1



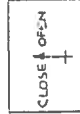
ATTACHMENT 1



CONTACTS		POSITION	
LEFT	RIGHT	OFF	ON
0-1-0	0-1-0	1	2
		X	

2 POSITION - MAINTAINED
OT251 CAM 1 OPERATOR
OT2A CONTACT BLOCK

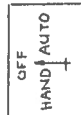
AA



CONTACTS		POSITION	
LEFT	RIGHT	CLOSE	OPEN
0-1-0	0-1-0	1	2
		X	

2 POSITION - MAINTAINED
OT251 CAM 1 OPERATOR
OT2A CONTACT BLOCK

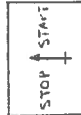
AB



CONTACTS		POSITION	
LEFT	RIGHT	HAND	AUTO
0-1-0	0-1-0	1	2
		X	

3 POSITION - MAINTAINED
OT256 CAM 6 OPERATOR
OT2M CONTACT BLOCK

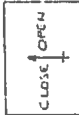
AC



CONTACTS		POSITION	
LEFT	RIGHT	STOP	START
0-1-0	0-1-0	1	2
		X	

3 POS. - SPRING RET TO NORM
OT2V6 CAM 6 OPERATOR
OT2A CONTACT BLOCK ROTATED 180°

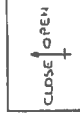
AD



CONTACTS		POSITION	
LEFT	RIGHT	CLOSE	OPEN
0-1-0	0-1-0	1	2
		X	

3 POS - SPRING RET TO NORM
OT2V6 CAM 6 OPERATOR
OT2M CONTACT BLOCK FRONT
OT2M CONTACT BLOCK REAR

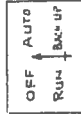
AE



CONTACTS		POSITION	
LEFT	RIGHT	CLOSE	OPEN
0-1-0	0-1-0	1	2
		X	

3 POS - SPRING RET TO NORM
OT2V6 CAM 6 OPERATOR
OT2M CONTACT BLOCK FRONT
OT2M CONTACT BLOCK 2ND
OT2M CONTACT BLOCK REAR

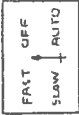
AF



CONTACTS		POSITION	
LEFT	RIGHT	RUN	BACK-UP
0-1-0	0-1-0	1	2
		X	

3 POSITION - MAINTAINED
OT25A CAM 11 OPERATOR
OT1C CONTACT BLOCK DPDT

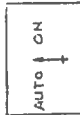
AG



CONTACTS		POSITION	
LEFT	RIGHT	FAST	AUTO
0-1-0	0-1-0	1	2
		X	

4 POSITION - MAINTAINED
OT25B CAM 13 OPERATOR
OT1C CONTACT BLOCK DPDT

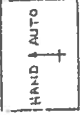
AH



CONTACTS		POSITION	
LEFT	RIGHT	AUTO	ON
0-1-0	0-1-0	1	2
		X	

2 POS - SPRING RET TO AUTO
OT251 CAM 1 OPERATOR
OT2A CONTACT BLOCK

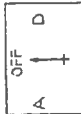
AJ



CONTACTS		POSITION	
LEFT	RIGHT	HAND	AUTO
0-1-0	0-1-0	1	2
		X	

2 POSITION - MAINTAINED
OT251 CAM 1 OPERATOR
OT2A CONTACT BLOCK

AK



CONTACTS		POSITION	
LEFT	RIGHT	A	D
0-1-0	0-1-0	1	2
		X	

3 POSITION MAINTAINED
OT256 CAM 6 OPERATOR
OT2M CONTACT BLOCK

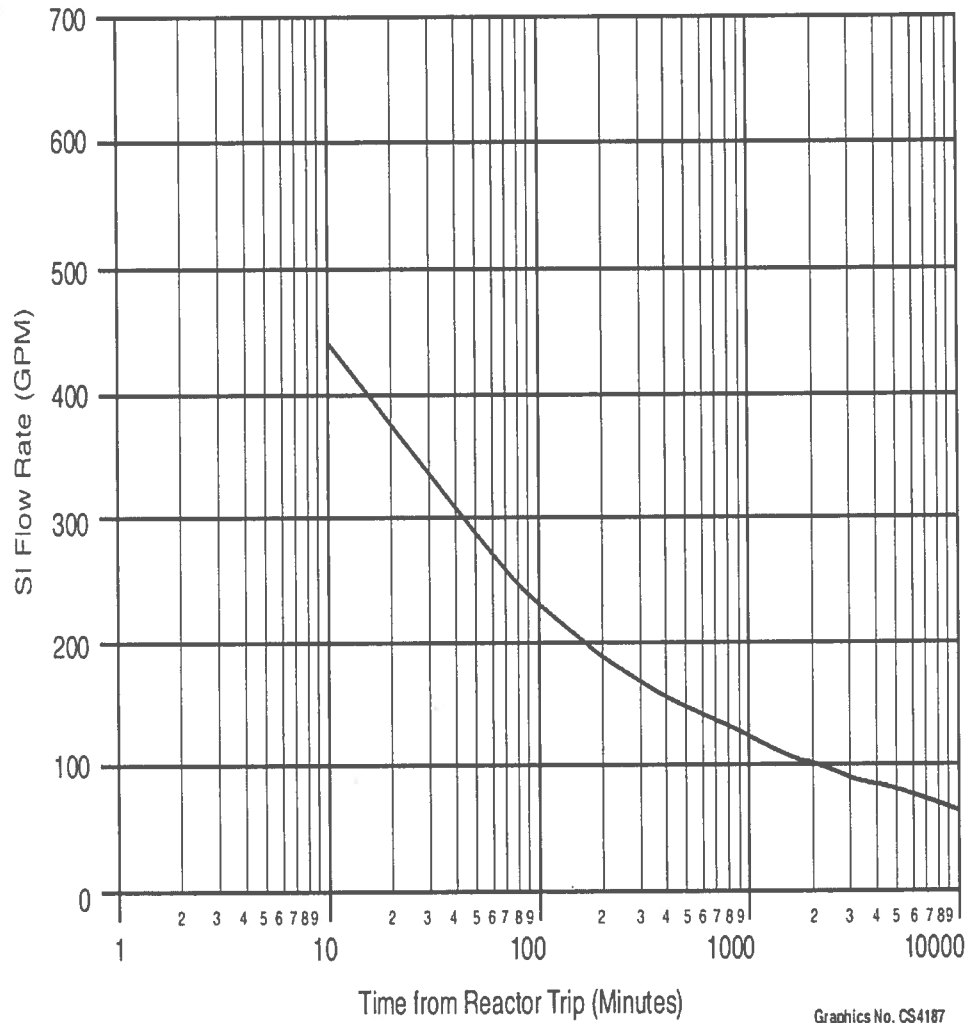
AL

CONTROL SWITCH CONTACT DIAGRAMS
SHEET 4
SURREY PWR STA UNIT NO 1
VIRGINIA ELECTRIC & POWER CO
STOR & WEBSTER ENGINEERING CORPORATION
11448-ESK-3D

7	6	5	4	3	2	1	3-106A	125V	1100
							125V	125V	1100

ATTACHMENT 2

NUMBER 1-ECA-1.1	ATTACHMENT TITLE	ATTACHMENT 1
REVISION 40	MINIMUM SI FLOWRATE FOR DECAY HEAT REMOVAL VERSUS TIME FROM REACTOR TRIP	PAGE 1 of 1



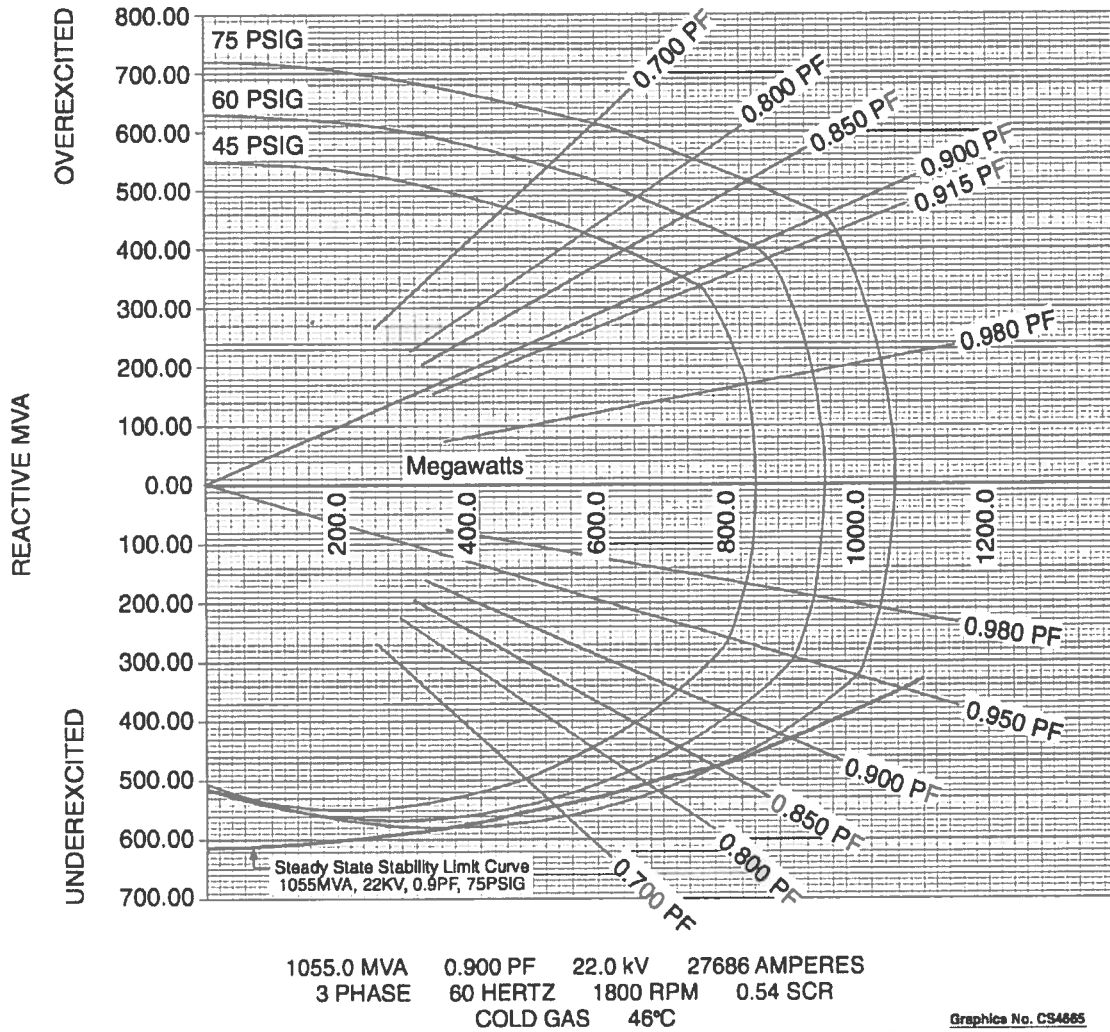
Graphics No. CS4187

ATTACHMENT 3

DOMINION
Surry Power Station

1-DRP-003
Revision 132
Page 98 of 211

(Page 1 of 2)
Attachment 52
CAPABILITY CURVES



2017 NRC ANSWER KEY

Question #	Answer		Question #	Answer	
RO					
1	A		41	C	
2	C		42	D	
3	A		43	C	
4	B		44	B	
5	B		45	B	
6	B		46	B	
7	B		47	A	
8	C		48	A	
9	A		49	D	
10	C		50	B	
11	A		51	D	
12	D		52	C	
13	A		53	B + C	Two correct answers for Question 53 based on Post-Exam Comment. M. B. Smith 12/11/17
14	A		54	D	
15	A		55	A	
16	D		56	C	
17	B		57	D	
18	C		58	D	
19	B		59	D	
20	A		60	A	
21	B		61	A	
22	C		62	D	
23	C		63	B	
24	C		64	B	
25	C		65	B	
26	B		66	B	
27	A		67	A	
28	B		68	D	
29	B		69	C	
30	D		70	A	
31	C		71	C	
32	C		72	B	
33	D		73	C	
34	A		74	D	
35	C		75	D	
36	D				
37	D				
38	B				
39	B				
40	B				