Final Submittal

(Blue Paper)

1. Reactor Operator Written Examination

MCGUIRE JUNE 2003 EXAM
50-369/2003-301 AND
50-370/2003-301

JUNE 16 - 30, 2003

ANSWER KEY REPORT

for RO McGuire 2003 test Test Form: 0

#	ID	Points	Type	Answers
1	ANSWER_KEY 1	1.00	MCS	B
2	ANSWER_KEY 2	1.00	MCS	D
3	ANSWER_KEY 3	1.00	MCS	D
4	ANSWER_KEY 4	1.00	MCS	C
5	ANSWER_KEY 5	1.00	MCS	A
6	ANSWER_KEY 6	1.00	MCS	D
7	ANSWER_KEY 7	1.00	MCS	C
8	ANSWER_KEY 8	1.00	MCS	D
9	ANSWER_KEY 9	1.00	MCS	C
10	ANSWER_KEY 10	1.00	MCS	C
11	ANSWER_KEY 11	1.00	MCS	B
12	ANSWER_KEY 12	1.00	MCS	D
13	ANSWER_KEY 13	1.00	MCS	B
14	ANSWER_KEY 14	1.00	MCS	A
15	ANSWER_KEY 15	1.00	MCS	A
16	ANSWER_KEY 16	1.00	MCS	B
17	ANSWER_KEY 17	1.00	MCS	D
18	ANSWER_KEY 18	1.00	MCS	D
19	ANSWER_KEY 19	1.00	MCS	D
20	ANSWER_KEY 20	1.00	MCS	A
21	ANSWER_KEY 21	1.00	MCS	B
22	ANSWER_KEY 22	1.00	MCS	C
23	ANSWER_KEY 23	1.00	MCS	C
24	ANSWER_KEY 24	1.00	MCS	A
25	ANSWER_KEY 25	1.00	MCS	B
26	ANSWER_KEY 26	1.00	MCS	A
27	ANSWER_KEY 27	1.00	MCS	A
28	ANSWER_KEY 28	1.00	MCS	A
29	ANSWER_KEY 29	1.00	MCS	C
30	ANSWER_KEY 30	1.00	MCS	B
31	ANSWER_KEY 31	1.00	MCS	D
32	ANSWER_KEY 32	1.00	MCS	D
33	ANSWER_KEY 33	1.00	MCS	C
34	ANSWER_KEY 34	1.00	MCS	B
35	ANSWER_KEY 35	1.00	MCS	C
36	ANSWER_KEY 36	1.00	MCS	A
37	ANSWER_KEY 37	1.00	MCS	D
38	ANSWER_KEY 38	1.00	MCS	D
39	ANSWER_KEY 39	1.00	MCS	A
40	ANSWER_KEY 40	1.00	MCS	C
41	ANSWER_KEY 41	1.00	MCS	B
42	ANSWER_KEY 42	1.00	MCS	D
43	ANSWER_KEY 43	1.00	MCS	C
44	ANSWER_KEY 44	1.00	MCS	D
45	ANSWER_KEY 45	1.00	MCS	B
46	ANSWER_KEY 46	1.00	MCS	C

ANSWER KEY REPORT

for RO McGuire 2003 test Test Form: 0

#	ID	Points	Type	Answers
47	ANSWER_KEY 47	1.00	MCS	B
48	ANSWER_KEY 48	1.00	MCS	D
49	ANSWER_KEY 49	1.00	MCS	A
50	ANSWER_KEY 50	1.00	MCS	A
51	ANSWER_KEY 51	1.00	MCS	C
52	ANSWER_KEY 52	1.00	MCS	B
53	ANSWER_KEY 53	1.00	MCS	B
54	ANSWER_KEY 54	1.00	MCS	D
55	ANSWER_KEY 55	1.00	MCS	B
56	ANSWER_KEY 56	1.00	MCS	D
57	ANSWER_KEY 57	1.00	MCS	D
58	ANSWER_KEY 58	1.00	MCS	B
59	ANSWER_KEY 59	1.00	MCS	D
60	ANSWER_KEY 60	1.00	MCS	D
61	ANSWER_KEY 61	1.00	MCS	A
62	ANSWER_KEY 62	1.00	MCS	B
63	ANSWER_KEY 63	1.00	MCS	D
64	ANSWER_KEY 64	1.00	MCS	A
65	ANSWER_KEY 65	1.00	MCS	C
66	ANSWER_KEY 66	1.00	MCS	D
67	ANSWER_KEY 67	1.00	MCS	B
68	ANSWER_KEY 68	1.00	MCS	D
69	ANSWER_KEY 69	1.00	MCS	C
70	ANSWER_KEY 70	1.00	MCS	A
71	ANSWER_KEY 71	1.00	MCS	C
72	ANSWER_KEY 72	1.00	MCS	D
73	ANSWER_KEY 73	1.00	MCS	B
74	ANSWER_KEY 74	1.00	MCS	C
75	ANSWER_KEY 75	1.00	MCS	D
SECTION 1 (75 items)		**75.00**		

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

Applicant Information	
Name:	
Date: June 30, 2003	Facility/Unit: McGuire
Region: II	Reactor Type: Westinghouse
Start Time:	*Finish Time:*

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination you must achieve a final grade of at least 80.00 percent. Examination papers will be collected six hours after the examination starts.

Applicant Certification

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

_____
Applicant's Signature

Results	
Examination Value	_____ Points
Applicant's Score	_____ Points
Applicant's Grade	_____ Percent

1 Pt

After a loss of all AC power (station blackout), ES 0.2 (*Natural Circulation Cooldown*) is implemented after AC power has been restored.

Given the following conditions:

1) NC pumps cannot be restarted.
2) Power has been restored to all station AC busses.
3) A natural circulation cooldown is in progress.

Step 18 of ES 0.2 requires that the operators maintain subcooling greater than 50 degrees if all CRD fans are running and greater than 100 degrees if less than all CRD fans are running using core exit thermocouples.

What is the EOP basis for these limits?

A. To prevent degradation of reactor coolant pump seals due to steam.

B. To prevent possible void formation in the upper head.

C. To collapse any voids formed in the CRD housings.

D. To ensure adequate subcooling due to possible degradation of core exit T/Cs accuracy.

1 Pt. Which one of the following selections correctly matches the reactor trip signals to their limiting accident?

	Reactor Trip Signal	Limiting Accident/Protection
A.	**OPΔT**	**DNB**
	OTΔT	**Excessive fuel centerline temperature**
	Pzr High Level	**DNB**
	Pzr Low Pressure	**NC system integrity**
B.	**OPΔT**	**Excessive fuel centerline temperature**
	OTΔT	**DNB**
	Pzr High Level	**DNB**
	Pzr Low Pressure	**NC system integrity**
C.	**OPΔT**	**DNB**
	OTΔT	**Excessive fuel centerline temperature**
	Pzr High Level	**NC system integrity**
	Pzr Low Pressure	**DNB**
D.	**OPΔT**	**Excessive fuel centerline temperature**
	OTΔT	**DNB**
	Pzr High Level	**NC system integrity**
	Pzr Low Pressure	**DNB**

1 Pt Given the following conditions:

- Unit 1 has experienced a large break LOCA
- 30 minutes have elapsed since the LOCA
- FWST Lo Lo level annunciator has just alarmed

Which one (1) of the following describes the operator actions for the alignment of the containment spray system after a LOCA?

A. **Reset Containment Spray and Phase 'B' and stop NS pumps within 45 seconds and manually swap the pump alignment to take suction on the containment sump.**

B. **Reset Containment Spray and the NS pumps will automatically swap over to take a suction on the containment sump when FWST level reaches 33".**

C. **Reset Containment Spray and Phase 'B" and stop the NS pumps within 45 seconds when FWST level reaches 33" and initiate containment spray flow from the ND system.**

D. **Reset Containment Spray and stop the NS pumps within 45 seconds when FWST level reaches 33" and manually swap the pump alignment to take suction on the containment sump.**

1 Pt.

A large break LOCA is in progress and the operators are responding in FR-Z.1 (*Response to High Containment Pressure*). Given the following conditions:

- ND pump 1A is tagged out of service for maintenance.
- Containment pressure is 14 psig.
- FWST level reaches the swap-over setpoint.

When shifting to cold leg recirc using ES-1.3 (Transfer to Cold Leg Recirc), valve 1NI-184B (RB Sump to Train 1B ND & NS) fails to open. The operators implement ECA-1.1 (Loss of Emergency Coolant Recirculation).

FR-Z.1 (Response to High Containment Pressure) requires both NS pumps to be in operation. ECA-1.1 limits the operators to only one NS pump in step 6. Which of these two procedures takes priority under these conditions and what is the basis for this requirement?

A. FR-Z.1 takes priority because a total loss of ND causes the NS system to become relatively more important to reduce containment pressure.

B. FR-Z.1 takes priority because it was implemented in response to a red path and FRPs always have priority over ECA procedures.

C. ECA-1.1 takes priority because it conserves FWST water level as long as possible for injection while providing sufficient NS flow to mitigate containment pressure.

D. ECA-1.1 takes priority because ECA procedures always have priority over FRPs.

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1 Pt. Unit 2 was operating at 100% power when an electrical fire started inside the auxiliary building cable spreading room. AP/0/A/5500/45 Plant Fire has been implemented.

Which one of the following describes how the of fire suppression system is actuated inside the cable spreading area and what are the hazards to personnel if they enter this room?

A. **An NLO is dispatched to open a manual deluge valve. An electrical shock hazard exists due to the use of water to combat an electrical fire.**

B. **An NLO is dispatched to verify automatic sprinkler system actuation. An electrical shock hazard exists due to the use of water to combat an electrical fire.**

C. **An NLO is dispatched to verify automatic Halon system actuation. An asphyxiation hazard exists due to the presence of Halon gas.**

D. **An NLO is dispatched to actuate a manual Cardox system. An asphyxiation hazard exists due to the presence of carbon dioxide gas.**

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1 Pt

Unit 1 is at 12% power with 4 NCPs running during a plant startup when an electrical transient occurs on the 6.9KV busses.

Given the following transient conditions:

	Electrical Bus			
Parameter	TA	TB	TC	TD
Frequency (Hz)	55	60	55	60
Voltage (Volts AC)	6800	6900	6800	6900

Offsite bus-line 1A is supplying TA and TC
Offsite bus-line 1B is supplying TB and TD

Which one of the following describes the immediate plant response to this transient?

A. No NCP pumps trip and the reactor does NOT trip

B. The 1' A 'and 1 'C' NCPs trip and the reactor trips

C. All four NCPs trip but the reactor does NOT trip

D. All four NCPs trip and the reactor trips

7

1 Pt

Unit 1 has experienced an ATWS and the operators are performing the immediate action steps of FR-S.1 (Response to Nuclear Power Generation/ATWS).

Given the following malfunctions:

1) The reactor is manually tripped
2) The turbine fails to trip automatically and manually.

Which one of the following describes the operator's response in FR-S.1 to respond to failure of the turbine to trip?

A. Place turbine in EMERGENCY MANUAL and close governor valves in fast action and close all MSIVs

B. Place turbine in MANUAL and close governor valves in fast action and close all MSIVs

C. Place turbine in MANUAL and close governor valves in fast action and if turbine will not runback then close all MSIVs and MSIV bypass valves

D. Place turbine in EMERGENCY MANUAL and close governor valves in fast action and if turbine will not runback then close all MSIVs and MSIV bypass valves

1 Pt Given the following plant conditions:

- Unit 1 in Mode 6.
- Reactor Missile Shield removed.
- "Norm-Refuel" Selector Switch in the REFUEL position.
- Fan Mode Selector Switch in the 100% position.
- 1EMF-38 trip 2 alarm.

Which one of the following selections describes the COMPLETE system response by the Containment Purge System?

A. Supply Fan (1B) will STOP.
Supply Damper will CLOSE.
Exhaust Fan (1B) will STOP.
Exhaust Damper will CLOSE.
Upper Containment Inside Isolation Valves will CLOSE.
Upper Containment Outside Isolation Valves will CLOSE.
Lower Containment Inside Isolation Valves will CLOSE.
Lower Containment Outside Isolation Valves will CLOSE.

B. Supply Fans (1A & 1B) will STOP.
Exhaust Fan (1A & 1B) will STOP.
Upper Containment Inside Isolation Valves will CLOSE.
Upper Containment Outside Isolation Valves will CLOSE.

C. Supply Fan (1B) will STOP.
Exhaust Fan (1B) will STOP.
Lower Containment Inside Isolation Valves will CLOSE.
Lower Containment Outside Isolation Valves will CLOSE.

D. Supply Fans (1A & 1B) will STOP.
Supply Damper will CLOSE.
Exhaust Fan (1A & 1B) will STOP.
Exhaust Damper will CLOSE.
Upper Containment Inside Isolation Valves will CLOSE.
Upper Containment Outside Isolation Valves will CLOSE.
Lower Containment Inside Isolation Valves will CLOSE.
Lower Containment Outside Isolation Valves will CLOSE.

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1 Pt Which ONE (1) of the following Containment Radiation Monitors will initiate containment ventilation isolation as indicated by the corresponding sequence of actions?

A. EMF-38(H) trip-1 will secure VP and VQ, and shutoff containment sump pumps and incore sump pumps.

B. EMF-39(L) trip-1 will sound the containment evacuation alarm, and secures VP and VQ.

C. EMF-40 trip-2 will secure VP and VQ, and shutoff containment sump pumps and incore sump pumps.

D. EMF-41 trip-2 will secure VP and VQ, and shutoff containment sump pumps and incore sump pumps.

1 Pt

Unit 1 was operating at 100% when a pipe break occurred on the 1D S/G steam header. The operators are responding in E-2 *(Faulted Steam Generator Isolation)*. The following sequence of events occurred:

- Isolation of the 1D S/G
- PZR level dropped to 0% and was restored to 20%
- NCS pressure is 1900 psig
- Safety Injection has not been reset

What are the correct panel actions for the restoration of power to pressurizer back-up heater bank D?

A. **Reset safety injection on 1MC-6.**
Ensure AUTO is selected on the heater mode switch on 1MC-10
Select CLOSED on the heater breaker switch on 1MC-5 (vertical board)

B. **Ensure AUTO is selected on the heater mode switch on 1MC-5**
Select CLOSED on the heater breaker switch on 1MC-10
Select ON for the heater control switch on 1MC-5

C. **Select MANUAL on the heater mode switch on 1MC-10**
Select CLOSED on the heater breaker switch on 1MC-5
Select ON for the heater control switch on 1MC-10

D. **Reset safety injection on 1MC-6**
Select MANUAL on the heater mode switch on 1MC-5
Select CLOSED on the heater breaker switch on 1MC-10
Select ON for the heater control switch on 1MC-5

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1 Pt

Unit 1 was operating at 100% power when a total loss of feedwater occurred. The operators reached Step 7 of FR-H.1 *(Response to Loss of Secondary Heat Sink)*, which attempts to establish CA flow to at least one S/G. Sub-step 7.k states:

> ***Maintain feed flow rate less than or equal to 100 GPM until S/G WR level is greater than 12% (17% ACC).***

Given the following conditions:

	Loop A	Loop B	Loop C	Loop D
S/G (WR) [%]	0	15	9	10
NC T_{Hot} [°F]	150	555	530	545

- Containment pressure is 3.4 psig
- The TD CA pump is available to feed the S/Gs

Which one of the following statements correctly describes the bases for the restrictions for restoring feedwater flow following feed and bleed in FR-H.1?

A. **Restore flow to the 'A' S/G because loop 'A' T-hot is the lowest of the loops and this will reduce the chance of thermal shocking the S/G. Flow should not be restored to the 'B' and 'C' S/Gs because they will be reserved for use later to provide a steam supply for the TD CA pump.**

B. **Restore flow to the 'B' S/G because 'B' S/G level is the highest and this will reduce the chance of thermal shocking the S/G. Flow should be preferentially restored to the 'B' or 'C' S/G to maintain the TD CA pump steam supply.**

C. **Restore flow to the 'C' S/G because loop 'C' T-hot is less than loop 'B' T-hot and this will reduce the chance of thermal shocking the S/G. Flow should be preferentially restored to the 'B' or 'C' S/G to maintain the TD CA pump steam supply.**

D. **Restore flow to the 'D' S/G because the 'D'S/G is higher than 'A' S/G level, which will reduce the risk of thermal shock. Flow should not be restored to the 'B' and 'C' S/Gs because they will be reserved for use later to provide a steam supply for the TD CA pump.**

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1 Pt

Unit 1 was conducting a plant start up. At 1% power, an instrument malfunction caused an inadvertent reactor trip. Given the following indications:

- Two rod bottom lights are NOT lit
- Reactor trip and bypass breakers are open
- IR amps = $2x10^{-8}$
- IR SUR = -0.3 DPM

Which one of the following response actions is required?

A. Implement AP/14, (*Control Rod Misalignment*) and respond to the stuck rods.

B. Implement E-0, (*Reactor Trip or Safety Injection*), and immediately transition to FR-S.2, (*Response to Loss of Core Shutdown*).

C. Implement E-0, (*Reactor Trip or Safety Injection*) and immediately transition to FR-S.1, (*Response to Nuclear Power Generation/ATWS*).

D. Implement E-0, (*Reactor Trip or Safety Injection*), and then transition to ES-0.1, (*Reactor Trip Response*).

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1 Pt

Unit 1 is in mode 6 and in the process of unlatching control rods. Which ONE (1) of the following limiting conditions requires immediately suspending all CORE ALTERATIONS in the Reactor Building?

A. Loss of one channel of SR NIs with both Gamma Metric SDMs in operation.

B. Loss of direct communications between the control room and the refueling bridge (refueling station).

C. Loss of the Fuel Handling Ventilation System.

D. Time since entering mode 2 is 102 hours.

1 Pt

Unit 1 is operating at 50% power. Given the following conditions:

- Pressurizer pressure is 2235 psig
- Pressurizer Relief Tank (PRT) pressure is 20 psig
- PRT temperature is 125 °F
- PRT level is 81%
- The PRT is being cooled by spraying from the RMWST
- A pressurizer code safety valve is suspected of leaking by its seat

What temperature would be indicated on the associated safety valve discharge RTD if the code safety were leaking by?

REFERENCES PROVIDED

A. 258-262 °F

B. 227-231 °F

C. 161-165 °F

D. 123 -127°F

1 Pt

In E-3 *(Steam Generator Tube Rupture)* Enclosure 5 *(NC Pressure and Makeup Control to Minimize Leakage)* the operators are directed to energize pressurizer heaters if the ruptured S/G level is decreasing and pressurizer level is greater than 25%.

What is the purpose for this action?

A. **Maintain pressurizer saturation temperature corresponding to ruptured S/G pressure to minimize S/G leakage into the NC system.**

B. **Maintain pressurizer saturation temperature corresponding to intact S/G pressure to minimize primary leakage into the S/G.**

C. **Maintain pressurizer saturation temperature above the corresponding ruptured S/G pressure to ensure S/G water does not flow into the NC system.**

D. **Maintain pressurizer saturation temperature corresponding to intact S/G pressure to minimize NC pressure transients.**

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1 Pt

During a cold startup, the NCPs are limited to 3 consecutive starts in any 2-hour period. There is an additional requirement of a minimum idle period of 60 minutes between restarts. What is the reason for these limitations?

A. This restriction assures that the NCP oil temperature will decrease to design specifications between restart attempts.

B. This restriction prevents overheating the motor windings due to high starting currents.

C. This restriction allows the NCP seals to fully reseat between NCP oil lift pump cycles.

D. This restriction ensures adequate Number 1 Seal Leakoff flow.

1 Pt

Unit 1 is responding to a small break LOCA using E-1 *(Loss of Reactor or Secondary Coolant)*. Given the following events and conditions:

- FWST Level = 340 inches
- Containment pressure = 1.5 psig
- Containment Sump Level = 1.05 ft
- EMF-41 (*AUX BLDG VENTILATION*) = trip 2
- Aux Building area radiation monitors are in alarm
- EMF-51A and B (*CONTAINMENT TRN A & B*) = 25 R/Hr
- Hydrogen Analyzer = 0.7% in containment
- NLO's report significant leakage at the seals of the 1A ND pump

Which one of the following procedures should the operator transition into from E-1?

A. **FR-Z.3 (*Response to High Containment Radiation Level*)**

B. **ECA-1.1 (*Loss of Emergency Coolant Recirculation*)**

C. **FR-Z.4 (*Response to High Containment Hydrogen*)**

D. **ECA-1.2 (*LOCA Outside Containment*)**

1 Pt

Unit 2 was at 10% during a plant startup when a loss of condenser vacuum occurred. Given the following conditions:

- The reactor was tripped
- The steam dump select switch was in steam pressure mode
- Condenser vacuum dropped to 18 inches
- No component or instrument failures occurred
- No operator action taken

Which one of the following sequences best describes the actuation of the steam dumps to this event?

	Condenser dump valves	Atmospheric dump valves
A.	**open**	**open**
B.	**open**	**shut**
C.	**shut**	**open**
D.	**shut**	**shut**

1 Pt

Unit 1 has initiated a liquid radioactive waste release from the Ventilation Unit Condensate Drain Tank (VUCDT) through the RC system. All lineups and authorizations have been properly made in accordance with OP/1/A/6500/001 A using the normal path. Two RC pumps are the minimum required under the LWR document.

Given the following initial conditions:

- 3 RC pumps are running
- 1EMF-44 *(CONT VENT DRN TANK OUT)* correctly set for trip 1 and trip 2 activity limits
- No other releases are in progress

If the release automatically terminates 40 seconds after initiation, which one of the following conditions could have terminated the release?

A. 1WM-46 *(LIQUID WASTE DISCH VALVE)* closing automatically if 2 RC pumps trip

B. 1WM-46 closing automatically if 1EMF-44 reached the trip 2 setpoint

C. 1WP-35 *(WMT & VUCDT TO RC CNTRL)* closing automatically if 1 RC pump tripped

D. 1WP-35 closing automatically if 1EMF-44 reached the trip 2 setpoint

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20

1 Pt

Unit 1 has just entered Mode 5 in preparation for refueling. Given the following conditions and events:

- A lower containment entry is planned for the next shift.
- The SRO directs the RO to purge the containment in preparation for the containment entry.
- Currently the VP system is secured with all fans off and containment purge and exhaust valves closed

Which one of the following describes the proper alignment of the containment purge system?

A. **The *NORMAL-REFUEL SELECTOR* switch is placed in the "*NORM*" position and ratio of supply air is 2/1 (Upper/Lower Containment).**

B. **The *NORMAL-REFUEL SELECTOR* switch is placed in the "*NORM*" position and ratio of supply air is 4/1 (Upper/Lower Containment).**

C. **The *NORMAL-REFUEL SELECTOR* switch is placed in the "*REFUEL*" position and ratio of supply air is 2/1 (Upper/Lower Containment).**

D. **The *NORMAL-REFUEL SELECTOR* switch is placed in the "*REFUEL*" position and ratio of supply air is 4/1 (Upper/Lower Containment).**

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1 Pt

Unit 1 is shutdown in a refueling outage. Given the following events and conditions:

- The VI system was in a normal lineup.
- The VS system was in a normal lineup.
- A VI header rupture occurs.
- The VI system completely depressurizes.

What effect does a total loss of the VI system have on the VS system?

A. VI-820 will auto-close as VI header pressure decreases below 82 psig and the VS air compressor will start automatically to maintain VS header pressure.

B. VI-820 will auto-close as VI header pressure decreases below 90 psig and the VS air compressor must be manually started to maintain VS header pressure.

C. Check valves in the VI - VS cross-connect line will close to isolate VS system pressure before it drops below 90 psig.

D. VS pressure in the Fire Protection Pressurizer Tank will be lost until a VS air compressor can be started.

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1 Pt

Unit 2 is operating at 75% power when a load rejection occurs. Which one of the following statements correctly describes the response of 2CM-420 (Load Rej Byp) to this transient?

A. 2CM-420 closes to prevent condensate water from being diverted to the suction of the hotwell pumps from the condensate booster pumps to assure minimum flow to the CF pumps.

B. 2CM-420 closes to prevent diversion of water from the "C" heater drain tank back to the UST thereby ensuring sufficient CF pump suction pressure.

C. 2CM-420 opens to divert condensate flow directly to the condensate booster pump suction to ensure that CF pumps have sufficient suction pressure.

D. 2CM-420 opens to divert condensate flow, bypassing around the condensate booster pumps, directly to the CF pumps to assure minimum flow requirements.

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1 Pt

Unit 1 was operating at 100% power when main condenser vacuum drops from 25 inches vacuum to 23 inches vacuum. Given the following events and conditions:

- All 3 condenser steam air ejectors (CSAEs) are in service
- Both primary and secondary jets are operating
- The system lineup is in the normal configuration

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

A. Loss of YM supply to the condenser boot seals

B. Loss of Main Steam to the CSAEs

C. CM flow to all CSAE inter-coolers has been obstructed

D. A CSAE drain was left open

1 Pt

Unit 1 was operating in Mode 3 during a plant shut down for a refueling outage. If a safety injection signal is received, which one of the following events will occur to protect the vital AC busses from overload?

A. **Only non-LOCA loads will be shed. The accelerated sequence will sequence remaining loads on after checking for adequate bus voltage.**

B. **A complete load shed will occur. The accelerated sequence will sequence LOCA loads on after checking for adequate bus voltage and DG speed.**

C. **A complete load shed will occur. The accelerated sequence will sequence LOCA loads on after checking for adequate bus voltage.**

D. **Only non-LOCA loads will be shed. The accelerated sequence will sequence remaining loads on after checking for adequate bus voltage and DG speed.**

1 Pt

Unit 2 was operating at 99% power when a steamline break occurred. Given the following events and conditions:

0200 The operators enter AP/01 (*Steam Leak*)
0200 The operators start reducing turbine load to match T_{ave} and T_{ref}
0201 The operators start a second NV pump and isolate letdown
0202 NLOs start investigating for the location of the steam leak
0203 *P/R OVER POWER ROD STOP* alarms – the RO reports that power is now going down.
0204 STA reports pressurizer level is decreasing and cannot be maintained
0205 The turbine building operator reports that the line to the atmospheric dump valves has a steam leak and cannot be isolated

If no safety injection has occurred and pressurizer pressure is maintained, which one of the following operator responses is correct?

A. Manually trip the reactor at 0203

B. Manually trip the reactor at 0204

C. Manually trip the reactor at 0205

D. Commence a rapid down power using AP/04 *(Rapid Downpower)* at 0205

1 Pt

Unit 2 was operating at 90% power after a start-up from a refueling outage. A pressurizer PORV is found to be leaking and the associated PORV block valve was shut. The PRT was cooled down to the following PRT conditions:

- PRT Level – 65%
- PRT Pressure – 9 psig
- PRT Temperature – 100°F
- Lower Containment Temperature - 118 °F

What actions are required to restore and maintain normal operating conditions to the PRT for the long term?

A. Vent the PRT to the waste gas system.

B. Vent the PRT to containment.

C. Cool the PRT by pressurizing with nitrogen and initiating spray flow from the NCDT.

D. Cool the PRT by initiating spray flow through the sparger line from the RWST

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1 Pt

Unit 1 has experienced a rupture of the RN piping inside containment. Emergency procedures prescribe successful response mechanisms if containment water level remains between 3.5 and 10.5 feet.

Why is safe plant recovery not assured for a design basis large break LOCA when containment water level exceeds 10.5 feet?

A. Operation of critical ECCS components needed for safe recovery is endangered by submersion.

B. Operation of the NS pumps is endangered by excess debris fouling the containment suction strainers.

C. Operation of the hydrogen purge system is compromised by loss of direct access to the containment atmosphere.

D. Operation of the ND system is compromised by high suction pressure

1 Pt

Unit 1 is operating at 100% power. The battery charger 1EDGA for the 1A emergency diesel generator battery has failed and will not provide a DC output.

Which one of the following statements correctly describes the effect on the 1A emergency diesel generator?

A. The 1A emergency diesel generator will start but not continue to run for its design basis committed time period without the battery charger in service.

B. The 1A emergency diesel generator will not start without the battery charger in service.

C. The 1A emergency diesel generator will start and run because the battery charger has a vital DC backup power supply, and will automatically supply the vital loads after starting.

D. The 1A emergency diesel generator will start and run because all safety grade auxiliary loads are supplied from the 600VAC motor control center supplied from 1ELXA.

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1 Pt

A station emergency battery is supplying DC bus loads without a battery charger online. If the load on the DC bus does not change, which one of the following statements correctly describes a vital battery's discharge rate (amps) as the battery is expended?

A. The discharge rate will be fairly constant until the design battery capacity (amp-hours) is exhausted and then will rapidly decrease.

B. The discharge rate will decrease at a faster rate until the design battery capacity is exhausted.

C. The discharge rate will increase at a faster rate until the design battery capacity is exhausted.

D. The discharge rate will initially decrease until approximately 50% design capacity had been expended and then increase until the battery has been exhausted.

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1 Pt

The crew has verified natural circulation in ES-0.1 *(Reactor Trip Response)* based on decreasing core exit thermocouple readings and subcooling > 0 °F. 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 VESSEL D/P* indication is greater than 100%.

D. S/G pressures are decreasing and T_{hot} is at S/G saturation temperature.

---

1 Pt

Unit 2 was operating at 100% when a complete loss of offsite power (LOOP) occurred. All systems were operable and in a normal alignment.

Which one of the following containment ventilation systems will have all operating fans/air handling units stopped after 5 minutes without any offsite power?

A. VU ventilation units

B. Pressurizer booster fans

C. Pipe tunnel booster fans

D. Steam generator booster fans

---

1 Pt

Unit 2 was at 75% R.T.P. when a loss of condenser vacuum occurred. Given the following conditions:

- Rods are in automatic
- The steam dump select switch is selected to 'Tave' mode
- Condenser vacuum is slowly decreasing
- No component or instrument failures occurred
- No operator action taken

Which one of the following sequences best describes the actuation of the control rods to this event?

A. Control rods move in due to decreased condenser back pressure

B. Control rods move out due to decreased condenser back pressure

C. Control rods move in due to increased condenser back pressure

D. Control rods move out due to increased condenser back pressure

---

1 Pt Unit 1 is responding to a LOCA from a trip at full power. Given the following events and conditions:

- A safety injection occurred at 0200.
- FWST level reaches 33 in. at 0246.
- S/I, Sequencers, and Containment Spray have been reset for both trains.
- The 1B NS pump has been successfully swapped to the containment sump.
- 1NS-18A (A NS Pump Suct From Cont Sump) will not open.

Which one of the following is the reason 1NS-18A will not open?

A. 1NS-43A (*A ND to NS Containment Outside Isol*) is CLOSED

B. "NS SYS CPCS TRAIN A INHIBIT" light LIT

C. 1NI-185A (*RB Sump to Train A ND & NS*) is CLOSED

D. 1NS-43A (*A ND to NS Containment Outside Isol*) is OPEN

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1 Pt

Unit 2 is in an outage. All the fuel is in the spent fuel pool. A fuel shuffle is in progress in the spent fuel pool. During the shuffle a fuel assembly is accidentally damaged and 2EMF-42 (Fuel Building Ventilation Radiation Monitor) goes into Trip 2.

Which one of the following describes the effect on spent fuel pool ventilation system as a result of 2EMF-42 in Trip 2?

A. The VF supply and exhaust fans trip and the filter is placed in the FILTRATION MODE.

B. No effect on VF system alignment.

C. The VF system is automatically placed in BYPASS MODE and the discharge dampers open and supply dampers close

D. The VF system is automatically placed in the FUEL HANDLING MODE OF OPERATION and the supply fans trip.

1 Pt

Unit 1 is at 100% power when indications are received of a "1B' Reactor Coolant Pump seal malfunction. AP/1/A/5500/08 *(Malfunction of NC Pump)* is implemented.

Which one of the following conditions describes a number two seal failure?

A. **# 1 Seal Leak off flow – GOING DOWN**
NC Pump number 2 Seal Standpipe low level alarm – LIT
NCDT input – STABLE, OR GOING DOWN

B. **# 1 Seal Leak off flow – GOING UP**
NC Pump number 2 Seal Standpipe high level alarm – LIT
NCDT input – STABLE, OR GOING DOWN

C. **# 1 Seal Leak off flow – GOING DOWN**
NC Pump number 2 Seal Standpipe high level alarm – LIT
NCDT input – GOING UP

D. **# 1 Seal Leak off flow – GOING UP**
NC Pump number 2 Seal Standpipe low level alarm – LIT
NCDT input – GOING UP

1 Pt Which one of the following pre-planned activities that has been evaluated and approved in advance by Operations can take place during shift turnover?

A. Dilution to ECB

B. ZPPT

C. Drain to Mid-Loop

D. Reactor Startup

1 Pt. Unit 1 is responding to a small break LOCA inside and outside containment. Given the following events and conditions:

- FWST Level indicates 340 inches
- Containment pressure indicates 1.5 psig
- Containment Sump Level indicates 1.05 ft
- 1EMF-41 (*AUX BLDG VENTILATION*) is in Trip 2 alarm
- Aux Building area radiation monitors are in alarm
- 1EMF-51A and B (*CONTAINMENT TRN A & B*) indicates 25 R/Hr
- Hydrogen Analyzer indicates 0.7% in containment
- NLO's report significant leakage at the seals of the "1A" ND pump

Which one of the following actions reduces excessive levels of radiation and guard against personnel exposure?

A. Monitor 1EMF-41 (*AUX BLDG VENTILATION*)

B. Dispatch NLO to energize Hydrogen Recombiners

C. Secure VA (Aux. Bldg. Ventilation System) to limit airborne contamination.

D. Identify and isolate the break

---

1 Pt.

Unit 1 is in mode 5 with the operators preparing for a plant startup by drawing a bubble in the pressurizer.

Given the following conditions:

1) LTOPs is in service
2) Pressurizer pressure is 325 psig
3) Pressurizer level is 25%
4) T_{ave} = 175 °F

If pressure increases to 400 psig, which one of the following describes the correct inputs for a PORV to actuate in LTOP mode?

A. **'D' loop Hot leg WR temperature < 320 degrees and WR pressure 'D' *loop >380 psig will actuate* PORV NC-34A**

B. **'C' loop Cold Leg temperature < 320 degrees and NR pressure 'A' loop > 380 psig will actuate PORV NC-32B**

C. **'C' loop Cold Leg temperature < 320 degrees and WR pressure 'A' loop > 380 psig will actuate PORV NC-32B**

D. **'D' loop Hot Leg WR temperature < 320 degrees and NR pressure 'D' *loop* > 380 psig will actuate PORV NC-34A**

1 Pt. Initial Conditions:

- Unit 1 is at 100% power
- "A" train essential components are in service

OAC alarms indicate an increase in reactor coolant pump motor winding temperatures.

Which of the following describes the reason for the increase in temperatures?

A. 1RN-40A (Train A to Non Essential Hdr Isol) has closed

B. 1KC-338B (NCP Supply)has closed

C. 1RN-43A (Train 1B to Non Ess Hdr Isol) has closed

D. 1KC-228B (RB HDR supply) has closed

1 Pt.

Unit 2 was operating at 100% power with the Pressurizer Pressure Control Switch in the '1-2' position and NC pressure in the normal operating band. Given the following plant conditions and events:

- NC pressure increases
- PORVs 1NC 32B and NC 36B open at 2335 psig
- Pressure modulates between 2315 psig and 2335 psig.

Which one of the following instrument failures would cause this plant response and what is the correct operator action perAP/11 (*Pressurizer Pressure Anomalies*)?

A. **PZR pressure channel I fails high**
Immediately swap controlling channels

B. **PZR pressure channel II fails low**
Place Pressurizer Pressure Master in Manual

C. **PZR pressure channel I fails low**
Place Pressurizer Pressure Master in Manual

D. **PZR pressure channel II fails high**
Immediately swap controlling channels.

---

1 Pt. Unit 1 is operating at 100% power when a small break LOCA occurs.

Given the following

a) Reactor Trip and Safety Injection Actuated
b) E-0 (*Reactor Trip or Safety Injection*) completed
c) Crew has exited E-0 to E-1 (*Loss of Reactor or Secondary Coolant*)
d) Both trains of ECCS equipment are functioning normally
e) Subcooling is 0 degrees
f) Pressurizer level is 2%
g) Containment pressure is 2.5 psig

Which one of the following should be the status of the reactor coolant pumps?

A. The reactor coolant pumps should still be running to provide forced cooling through the core.

B. The reactor coolant pumps should be stopped to prevent excessive depletion of the NC system water inventory.

C. The reactor coolant pumps should still be running to refill the pressurizer in order to terminate Safety Injection flow.

D. The reactor coolant pumps should be stopped to prevent pump damage due to loss of pump support systems.

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1 Pt. Unit 2 is operating at 100% power when the following occurs:

- Loss of offsite power
- Neither Diesel Generator starts
- ECA-0.0 (*Loss of All AC Power*) is in effect
- Standby Makeup pump for unit 2 tagged for maintenance
- Reactor Coolant Pump seal injection valves have been closed

Twenty minutes later power is restored to Unit 2 ETA from Unit 1, and the crew enters ECA-0.1 (*Loss of All AC Power Recovery Without S/I Required).*

Which of the following best describes the proper method for restoring NCP seal flows in ECA-0.1?

A. Slowly restore seal injection cooling limiting the cooldown rate to 1 degree per minute

B Do not restore seal injection cooling due to potential damage to the KC thermal barrier heat exchanger.

C Restore seal injection cooling as rapidly as possible to minimize the potential for seal degradation.

D. Do not restore seal injection cooling due to potential damage of thermal shock to the reactor coolant pump seals.

---

1 Pt. Unit 1 has experienced a large break LOCA.

Given the following conditions:

- E-0 (*Reactor Trip or Safety Injection*) is complete
- ES 1.3 (*Transfer to Cold Leg Recirc*) is complete
- Six hours have elapsed since the LOCA and ES 1.4 (*Hot Leg Recirc*) is being implemented.
- 1NI-121A (Train 'A' NI to B & C Hot Leg) will not open due to mechanical binding.
- ND Train 'A' has been aligned for Hot Leg Recirc.
- ND Train 'B' is aligned for Auxiliary Containment Spray.

Which of the following best describes the effects on the ND system if the 'A' ND pump trips?

A. Flow is lost to the 'A' and 'B' hot legs

B. Flow is lost to the 'A', 'B', 'C' and 'D' hot legs

C. Flow is lost to the 'B' and 'C' hot legs

D. Flow is lost to 'A' and 'D' hot Legs

---

1 Pt. Unit 1 is operating at 100% power when the 'A' Main steam line ruptures outside containment and depressurizes the 'A' S/G.

Which of the following describes the logic and coincidence needed to actuate a Main Steam Isolation signal?

A. 1/4 on 1/4 steamlines

B. 2/3 on 2/4 steamlines

C. 1/4 on 2/4 steamlines

D. 2/3 on 1/4 steamlines

---

1 Pt. Given the following Unit 1 initial conditions

- 100% power with Tave = Tref
- NC System Boron Concentration 953 ppm
- Control Bank 'D' rods are at 217 steps
- Control Bank 'D' Rod H-8 drops fully into the core
- AP/1A/5500/14 *Rod Control Malfunction* is entered and immediate actions are completed

Thirty minutes after the rod drops

- Load has been reduced to 95% power with Tave = Tref
- NC System Boron Concentration 953 ppm
- Control Bank 'D' rods are at 217 steps
- Rod H-8 has not been retrieved

Which one of the following describes the effect of the event on Rod Insertion Limits and Shutdown Margin?

A. Rod insertion limit is unchanged and shutdown margin is increased.

B. Rod insertion limit is decreased and shutdown margin is unchanged.

C. Rod insertion limit is unchanged and shutdown margin is decreased.

D. Rod insertion limit is decreased and shutdown margin is decreased.

---

1 Pt. Unit 1 is in Mode 3 at normal operating temperature and pressure. While performing trouble shooting activities 1NV-94AC (NC Pump Seal Return Containment Isolation Valve) closes.

Which of the following best describes the effect on the Reactor Coolant Pumps seal return flow?

A. Seal return flow continues and is routed to the NCDT.

B. Seal return flow continues through 1NV-95B to VCT.

C. *Seal return flow continues and is routed to the* PRT.

D. Seal return flow continues to the VCT through a bypass line around 1NV-94AC.

---

1 Pt. Unit 2 was operating at 49% power when the following indications were observed:

- Steam Generator level in the 2A S/G is 84% on 2/3 level indications
- Feedwater flows decreasing
- Feedwater Isolation Signal actuated

Which of the following describes the plant response to the above condition?

A. Feedwater pump 'A' only has tripped.

B. Both feedwater pumps have tripped, the turbine and reactor have tripped.

C. Feedwater pump 'A' and the turbine only have tripped.

D. Both feedwater pumps and turbine have tripped, the reactor did not trip.

---

1 Pt. Given the following conditions:

- Unit 1 is at 100%
- No annunciators are in alarm
- TD CA pump is being started for post maintenance testing (oil change)
- RO places the #1 TD CA Pump to 'START'
- The TD CA pump starts but does not achieve rated speed.

Which of the following describes the potential reason the TD CA pump failed to reach rated speed?

A. The TD CA pump stop valve is not fully open.

B 1SA-48ABC (*1C S/G SM Supply to unit 1 TD CA Pump Turb Isol*) failed to OPEN.

C The Control Room/Local switch at local panel is in Local control.

D. The Woodward Governor speed setting was not cycled after the last PT.

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1 Pt.

During the delivery of chlorine gas cylinders on site, a cylinder fell from the truck and ruptured. All control room VC intakes closed except 1VC-9A (VC OTSD AIR INTAKE ISOL FROM UNIT 2) and 1VC-11B (VC OTSD AIR INTAKE ISOL FROM UNIT 2) which were mechanically bound and failed to close completely. Chlorine gas has entered the control room. AP/1/A/5500/17 (*Loss of Control Room*) has been implemented on both Units.

Which one of the following describes S/G pressure control for the condition described above?

A. All S/G PORV's are controlling between 1092 psig and 1125 psig.

B. 'A' and 'B' S/G PORV's are controlled manually to maintain less than 1170 psig.

C. 'C' and 'D' S/G PORV's are controlled manually to maintain less than 1170 psig

D. Only 'A' and 'D S/G PORV's are controlling between 1092 psig and 1125 psig.

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1 Pt. Given the following conditions on Unit 1:

- Blackout on ETB
- The 1B D/G started in automatic mode and tripped due to overspeed
- An Operator has been dispatched to depress "Emergency Stop Reset Pushbutton".

Which one (1) of the following describes why the diesel generator restarted once the Emergency Stop Reset Pushbutton was depressed?

A. The engine overspeed trip resets, and the undervoltage *condition* was still present.

B. The sequencer was reset to its ground state and the accelerated sequence relay timed out.

C. The sequencer was reset and placed it in priority mode and the undervoltage condition was still present.

D. The engine overspeed trip resets, and the accelerated sequence relay timed out.

1 Pt

Given the following conditions:

- Unit 1 is operating at 25% power
- All electrical systems are in normal alignment
- The normal incoming breaker to 1EMXA trips because of a thermal overload.

Which one of the following describes the effect on 125 VDC Distribution Center EVDA?

A. No effect; alternate power to Charger Connection box ECB-1 will swap within 8 cycles and maintain power to EVDA.

B. No effect; battery EVCC will continue to power EVDA.

C. No effect; battery EVCA will continue to power EVDA.

D. EVDA will be de-energized until cross tied with EVDD.

---

1 Pt

Unit 2 was operating at 100% when a Floor Cooling Glycol High Temperature annunciator is received. A review of the RTD panel reveals that several ice condenser floor slabs have high temperature indications. An operator determines that 2NF-848 (*NF Floor Cooling Slab Temp Control*) has failed closed. An inspection of the lower ice condenser reveals that eight (8) ice condenser bays have experienced buckling.

Which one of the following statements describes the effect on peak containment pressure and time to reach peak containment pressure?

A. Design containment pressure of 15 psig will not be exceeded. The time to reach peak containment pressure is 50 minutes.

B. Design containment pressure of 15 psig could be exceeded. The time to reach peak containment pressure is 1.75 hours.

C. Design containment pressure of 60 psig will not be exceeded. The time to reach peak containment pressure is 50 minutes.

D. Design containment pressure of 60 psig could be exceeded. The time to reach peak containment pressure is 1.75 hours.

---

1 Pt Which one of the following are the power supplies for the Unit 1 MG sets?

A. 1LXE and 1LXF

B. 1LXF and 1LXG

C. 1SLXF and 1SLXG

D. 1SLXG and 1SLXH

1 Pt Which one of the following is the power supply for the 2B Hydrogen Recombiner?

A. 2TA

B. 2ETA

C. 2EMXC

D. 2EMXD

1 Pt Given the following conditions on Unit 2:

- 75% power
- Annunciator "Subcooling Margin Alert" comes into alarm

Which one of the following describes the origin of the alarm?

Reference Provided

A. Wide Range Pressure Loop 'C' fails to '0' psig

B. Wide Range Pressure Loop 'D' fails to '0' psig

C. One safety related thermocouple fails to 725 degrees

D. Wide Range T hot 'B' loop failing high to 650 degrees

1 Pt

Unit 1 was at 100% power when the 'A' FWPT trips. Rods fail to insert as required. The RO places the control rod mode select to manual. The combined power mismatch signal is +4. The operator drives rod in.

Which one of the following describes the response of the rod control system?

A. Rods will insert at 72 steps per minute.

B. Rods will insert at 64 steps per minute.

C. Rods will insert at 40 steps per minute.

D. Rods will insert at 48 steps per minute.

---

1 Pt

A fire on the McGuire site has rendered the control room uninhabitable due to smoke in the control room. Both units have entered the AP/1/A/5500/17 (*Loss of Control Room*).

Which one of the following describes the RO actions described in AP/1/A/5500/17 *Loss of Control Room*?

A. Go to Aux Shutdown Panel.

B. Go to main turbine front standard.

C. Go to Unit 1 CF pumps.

D. Go to "REACTOR PUMP WATER MAKEUP CONTROL PANEL" if dilution in progress.

---

1 Pt While shifting to cold leg recirc during a LOCA, 1ND 58A (*NV/ NI pump Train A Isolation*) will not open.

Which one of the following is a possible cause of this problem?

A. 1NI-115B (*A NI Pump Miniflow*) must first be closed.

B. 1NI-185A (~~*TRAIN A ND TO NV & NI PUMPS*~~) must first be open. (RB SUMP TO TRAIN A ND & NS) LLR 6/30/03

C. 1ND-19A (*A ND Pump Suction From FWST or NC*) must first be open.

D. 1NI-144B (*B NI Pump Miniflow*) must first be closed.

1 Pt Given the following conditions on Unit 1:

- Unit 1 is in Mode 5 after an outage.
- 'B' Train of ND is in RHR mode
- In the process of swapping to 'A' train ND
- An NLO is stationed outside the 'A" ND HX room to listen for excessive vibration.
- After the swap has been completed the following is noticed
  a. EMF 1 and EMF 41 in alarm
  b. NC level decreasing and temperature increasing
  c. ND flow increasing

Which one (1) of the following is the cause of the above failure?

A. Relief valve 1ND-56 (*Discharge Relief Valve*) has failed open to PRT

B. 1ND-34 (*A & B ND Hx Bypass*) fails OPEN

C. Relief valve 1ND-56 (*Discharge Relief Valve*) has failed open to NCDT.

D. Flange leak on 'A' RHR heat exchanger.

---

1 Pt

Given the following conditions on Unit 1:

- Unit 1 ETB normal breaker has opened
- '1B' Diesel Generator has started and has loaded the bus

Which one (1) of the following will trip the diesel generator?

A. Lube Oil Temperature 195 degrees

B. Jacket Water Temperature 205 degrees

C. Turning Gear Engaged

D. Overspeed 113%

---

1 Pt

Diesel generator '1B' has been started per OP/1/A/6350/002 (Diesel Generator) from the control room. The diesel has been carrying the load separated from the grid. It is time in the procedure to transfer load back to the grid and shutdown the diesel.

Which one (1) of the following describes the actions in proper sequence necessary to remove load from the diesel?

A. **Match D/G voltage with line voltage**
Place '1B D/G Sync Switch' to 'ON'
Adjust diesel speed to move slowly in the Fast direction using '1B D/G Gov Control' pushbutton
Close normal breaker when 3 minutes before 12 o'clock
Raise D/G output to 800 to 1000 KW
Adjust Power factor to .90 to .92

B. **Place '1B Sync Switch' to 'ON'**
Adjust diesel speed to move slowly in the Fast direction using Voltage Adjust pushbutton
Transfer load from '1B' D/G to 1ATD by obtaining zero amps on 1ATD meter
Close normal breaker when 3 minutes before 12 o'clock
Raise D/G output to 800 to 1000 KW
Adjust Power factor to .90 to .92

C. **Place '1B Sync Switch' to 'ON'**
Adjust diesel speed to move slowly in the Fast direction using '1B D/G Gov Control' pushbutton
Close normal breaker when 3 minutes before 12 o'clock
Raise D/G output to 100 to 200 KW
Adjust Power factor to .90 to .92
Match D/G voltage with line voltage

D. **Place '1B Sync Switch' to 'ON'**
Adjust diesel speed to move slowly in the Fast direction using Voltage Adjust pushbutton
Transfer load from '1B' D/G to 1ATC by obtaining zero amps on 1ATC meter
Close normal breaker when 3 minutes before 12 o'clock
Raise D/G output to 100 to 200 KW
Adjust Power factor to .90 to .92

1 Pt Given the following conditions on Unit 1:

- Unit 1 heating up in Mode 3 following a refueling outage
- An NLO calls the RO and advises that the boric acid filter delta/p is pegged HIGH
- Discharge pressure on 1A Boric Acid Tank pump is pegged HIGH

Which one (1) of the following describes the effect on the boron injection flowpath from the Boric Acid Tank?

A. No effect after swapping to the 1B BAT pump.

B. Boron injection flowpath from BAT via the boric acid pumps and charging pump to NC is inoperable.

C. No effect after swapping to standby filter in service.

D. Boron injection flowpath is operable due to availability of 1NV-265B.

---

1 Pt Which one of the following describes the operational differences to ESF systems for a double ended break inside containment versus a LOCA outside Containment?

A. **On a LOCA outside containment there will be no containment isolation signal.**

B. **There are no operational differences.**

C. **On a LOCA outside containment the containment sump valves do not automatically open on low FWST level.**

D. **As FWST inventory depletes there is no corresponding increase in containment sump level.**

---

1 Pt Which one (1) of the following provides separation between control system and protection system circuits?

A. Isolation Amplifier

B. Diodes

C. Separate input signal

D. Or/And gate

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1 Pt

Given the following conditions on Unit 1:

- Loss of Offsite Power coincident with a LOCA
- Power has been restored to ETA via '1A' D/G while in EP/1/A/5000/ECA-0.0 (*Loss of All AC Power*)
- NC Subcooling is -1 degree
- Pzr level is 0%
- 1NI-9A (*NC Cold Leg Inj from NV*) is closed
- 1NI-10B (*NC Cold Leg Inj from NV*) is closed

Which one (1) of the following procedure is required for optimal recovery of the plant?

A. **Go to EP/1/A/5000/ECA-0.1 (*Loss of All AC Power Recovery Without S/I Required*)**

B. **Go to EP/1/A/5000/E-1 (*Loss of Reactor or Secondary Coolant*)**

C. **Go to EP/1/A/5000/ECA-0.2 (*Loss of All AC Power Recovery With S/I Required*)**

D. **Go to EP/1/A/5000/ES-1.2 (*Post LOCA Cooldown and Depressurization*)**

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1 Pt

Given the following conditions on Unit 1:

- Large break LOCA occurred.
- Both trains of NV, NI, ND, NS are running

	Loop A	Loop B	Loop C	Loop D
S/G (NR) [%]	10	9	10	9

The operators are in E-0 (*Reactor Trip or Safety Injection*) step 17. The RO tells the SRO NC temperature is decreasing. The RO is instructed to implement Enclosure 3 *Uncontrolled NC System Cooldown.*

Which one of the following statements correctly describes the method for controlling feed flow?

REFERENCES PROVIDED

A. **When N/R level is greater than 11% in one S/G throttle feed flow to minimum and maintain N/R level greater than 11% in at least one S/G.**

B. **When N/R level is greater than 32% in all S/Gs throttle feed flow to minimum and maintain N/R level greater than 32% in all S/Gs.**

C. **If N/R level is less than 11% in all S/Gs throttle feed flow to minimize cooldown and maintain total feedwater flow greater than 450 gpm.**

D. **If N/R level is less than 32% in all S/Gs throttle feed flow to minimize cooldown and maintain total feedwater flow greater than 450 gpm.**

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1 Pt Given the following conditions on Unit 1:

- RTP 100%
- A CM system transient has caused both FWPT's to trip.
- The turbine and reactor failed to trip automatically.
- The Operator at the Controls, per the immediate actions of FR-S.1 (*Response to Nuclear Power Generation/ATWS*), will
  1. Manually trip the Reactor if it fails to trip, insert control rods.
  2. Manually trip the Turbine if it fails to trip, runback the turbine in fast action.

Which one (1) of the following describes the bases for the immediate actions in FR-S.1 (Response to Nuclear Power Generation/ATWS)

A. **The safeguards systems are designed assuming that the only heat being added to the NC system is decay heat and NC pump heat. If the reactor will not trip, then the rods are manually inserted to lower reactor power. For an ATWS event with a loss of normal feedwater, a Turbine trip within 30 seconds will prevent challenging the PZR PORV's.**

B. **The safeguards systems are designed assuming that the only heat being added to the NC system is decay heat and NC pump heat. If the reactor will not trip, then the rods are manually inserted to lower reactor power. For an ATWS event with a loss of normal feedwater, a Turbine trip within 30 seconds will maintain S/G inventory.**

C. **The safeguards systems are designed assuming that the only heat being added to the NC system is from less than 5% power. If the reactor will not trip, then the rods are manually inserted to lower reactor power to less than 5%. For an ATWS event with a loss of normal feedwater, a Turbine trip within 30 seconds will maintain S/G inventory.**

D. **The safeguards systems are designed assuming that the only heat being added to the NC system is from less than 5% power. If the reactor will not trip, then the rods are manually inserted to lower reactor power to less than 5%. For an ATWS event with a loss of normal feedwater, a Turbine trip within 30 seconds will prevent challenging the PZR PORV's**

1 Pt

One of the functions of the Containment Spray System (NS) is to remove fission product iodine from the containment atmosphere during a design basis LOCA.

Which one (1) of the following describes how and when this is *accomplished*?

A. **During the Injection phase by providing a spray of cold and subcooled borated water from the FWST into the upper containment volume.**

B. **During the Injection phase by providing a spray of water with an alkaline pH from the containment sump into the upper containment volume.**

C. **During the Recirculation phase by providing a spray of cold and subcooled borated water from the FWST into the upper containment volume.**

D. **During the Recirculation phase by providing a spray of water *with an alkaline pH from the containment sump* into the upper containment volume.**

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68 on 69

1 Pt Given the following conditions on Unit 1:

- RTP is 100%
- 'B' train is in operation
- CF&E sump HI level alarm is lit.
- All NC Pump Motor Bearing LO KC flow annunciators are lit.
- All NC Pump upper Motor Bearing temperatures are trending up.
- "B" NC Pump Upper Motor Bearing temperature is 197 degrees.
- AP-21(*Loss of KC or KC System Leakage*) has been implemented.

Which one (1) of the following describes the operator's response to "B" NCP Upper Motor Bearing HI temperature?

References Provided

A. Close 1NC-29 (*B Loop PZR Spray Control*), trip the reactor, stop "B" NC Pump and go to EP/1/A/5000/E-0

B. Trip the reactor, stop "B" NC Pump and go to EP/1/A/5000/E-0

C. Trip the reactor, trip all NC Pumps and go to EP/1/A/5000/E-0

D. Close 1NC-29, trip the reactor, trip all NC Pumps and go to EP/1/A/5000/E-0

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69 BM
70

1 Pt Given the following conditions on Unit 1:

- Medium size LOCA has occurred with valid Ss, St and Sp signals
- S/I termination criteria are satisfied
- One NV pump has been secured
- Both NI pumps have been secured
- Both ND pumps have been secured
- Pzr Spray valves are closed

Pressurizer level is 25% and decreasing. Which one of the following describes the correct operator actions?

REFERENCE PROVIDED:

A. **Restart S/I pumps and realign NV S/I flowpath as necessary to restore subcooling and level, GO TO EP/1A/5000/E-1 (*Loss of Reactor or Secondary Coolant).***

B. **Go to EP/1/A/5000/ES 1.2 (*Post LOCA Cooldown and Depressurization).***

C. **Go directly to EP/1/A/5000/ES-0.0 (Rediagnosis)**

D. **Reinitiate Safety Injection and GO TO EP/1/A/5000/E-0 (*Reactor Trip or Safety Injection).***

~~70~~ 71

1 Pt. The SRO instructs the Unit 1 RO to adjust NC Pump seal leak off flow by cooling the VCT. The potentiometer on 1KC-132 (*Letdown Heat Exchanger Outlet Temperature Control*) was adjusted to lower VCT temperature 6 degrees.

Which one of the follow is the correct plant response to this adjustment?

A. **VCT temperature decreases**
KC pump flow decreases
KC pump discharge pressure increases
NC temperature increase
Main Steam pressure increases.

B. **VCT temperature decreases**
KC Pump flow increases
KC Pump discharge pressure decreases
NC temperature decrease
Main Steam pressure decreases

C. **VCT temperature decreases**
KC Pump flow increases
KC Pump discharge pressure decreases
NC temperature increase
Main Steam pressure increases

D. **VCT temperature decreases**
KC Pump flow decreases
KC Pump discharge pressure increases
NC temperature decreases
Main Steam pressure decreases

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71 EU
72

1 Pt. Given the following conditions on Unit 1:

- ORANGE Path on Core Cooling
- RED Path on Heat Sink

Which one of the following describes why Red path on Heat Sink is addressed prior to the Orange Path on Core Cooling?

A. A Red path indicates the CSF is under <u>severe</u> challenge and prompt operator action is required.

B. A Red path indicates the CSF is <u>not satisfied</u> and operator action may be taken.

C. Heat Sink has a <u>higher priority</u> than Core Cooling due to position on status trees.

D. A Red path indicates the CSF is under <u>extreme</u> challenge and immediate operator action is required.

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1 Pt. Unit 1 is in the process of cooling down to Mode 5 to enter refueling outage.

- Steam dumps in Steam Pressure Mode with Steam Dump Controller in Manual
- 15 minutes after cooldown has begun from 557 degrees steam dumps close.

Which one of the following describes the correct reason the steam dumps closed?

A. Potentiometer set too high on Steam Dump Controller.

B. Cooled down to P-12.

C. C-7A not reset.

D. Tave and Tref deviation is less than 3 degrees.

1 Pt. Given the following conditions on Unit 1:

- RN system is in normal alignment
- RN pump 'B' is running
- RV pumps are in normal alignment
- Unit 1 experiences a Safety Injection

Which one of the following describes the cooling water supply provided to lower containment ventilation loads?

A. 'A' RN pump

B. 'B' RN pump

C. RV pump in AUTO that starts on low non-essential header pressure.

D. RV pump in AUTO that starts on safety injection signal.

74 EQ
75

1 Pt(s) Unit 1 is in the process of releasing the Ventilation Unit Condensate Drain Tank (VUCDT) using approved station procedures. Just after the release was initiated, the 1EMF-44 (Ventilation Unit Condensate Drain Tank) power supply fails.

Which one of the following statements correctly describes the effect on this Liquid Waste Release (LWR)?

REFERENCE PROVIDED

A. **1EMF-44 fails in the conservative direction and both Trip 1 and Trip 2 alarm, terminating the release. The high radiation alarms can not be reset and the release can not be continued.**

B. **1RAD2-F/2, 'EMF-44 LOSS OF CONT VENT DRN TNK SAMPLE FLOW' alarms and the release must be terminated.**

C. **1EMF-44 will alarm Trip 1 and Trip 2 terminating the release. The Trip 2 alarm may be reset only one time, if no further alarms are received. The LWR may proceed provided that station RP performs an analysis of grab samples for radioactivity at a lower limit of detection.**

D. **Nothing, there is no effect on this LWR. The LWR may proceed provided that station RP performs an analysis of grab samples for radioactivity at a lower limit of detection.**